

Bundled Wind Power Project in Madhya Pradesh, Gujarat and Kerala by D.J. Malpani



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Summary:

Validation purpose: The purpose of the project activity (*hereafter referred as “proposed project activity”*) is to generate power using renewable energy source (wind energy) and sell the power generated to the state grid. The project activity generates electricity using wind energy. The generated electricity is exported to the regional grid system which is under the purview of the INDIAN electricity grid of India.

The wind power generated from the Project will be displacing the electricity generated from thermal power stations feeding into Indian grid (Indian Electricity Grid) and will be replacing the usage of diesel generators for meeting the power demand during shortage periods. Since, the wind power is Green House Gas (GHG) emissions free, the power generated will prevent the anthropogenic GHG emissions generated by the fossil fuel based thermal power stations comprising coal, diesel, furnace oil and gas. The estimation of GHG reductions by this project is limited to carbon dioxide (CO₂) only

The power produced displaces an equivalent amount of power from the grid, which is fed mainly by fossil fuel fired power plants. Hence, it results in reduction of GHG emissions. Average estimated annual GHG emission reductions from the project activity will be 127,207 tonnes of CO₂ and total GHG emission reductions for the chosen 10 year crediting period will be 1,272,070 tonnes of CO₂.

In the Pre- project scenario the entire 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.

A risk based approach has been followed to perform this validation activity. In the course of Joint Validation and Verification, for validation scope, 07 Corrective Action requests (CARs) and 00 Clarification Requests (CLs) and 00 Forward action request (FARs) were raised and successfully

closed. The review of the project description and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews and PP have provided *LGAI Technological Center, S.A. (Applus+ Certification)* with sufficient evidence to verify the fulfilment of the stated criteria of VCS for validation purpose.

Verification purpose:

The proposed project activity involves the installation of Wind Power Projects. The total installed capacity of the project is 66 MW; which involves operation of Wind Turbine Generators (WTGs) in multiple states of India. The details of the project is given below:

SI No.	Project Type	Project Capacity (in MW)	Owner of Project	Project Location	State
1	Wind	4.5 MW	D. J. Malpani	Dhar Site, Dhar	Madhya Pradesh
2	Wind	7.5 MW	D. J. Malpani	Ghatiya Site, Ujjain	Madhya Pradesh
3	Wind	6 MW	D. J. Malpani	Sadla Site, Surendranagar	Gujarat
4	Wind	26 MW	D. J. Malpani	Savarkundala Site, Amreli	Gujarat
5	Wind	22 MW	D. J. Malpani	Kinfra Site, Palakkad	Kerala

The Project activity is a new facility (Greenfield) and the purpose of the project activity is to generate energy electricity by the utilization of renewable wind technology and further selling the generated energy to the Indian Grid. In this process there is no consumption of any fossil fuel and hence the project does not lead to any greenhouse gas emissions. Thus, electricity would be generated through sustainable means without causing any negative impact on the environment.

During the Current Monitoring Period from 28/03/2016 to 23/12/2017 (First and last date included) the project activity has supplied 79,128 MWh of electricity, and thus contributing to the GHG reductions 76,380 tCO_{2e}.

A risk based approach has been followed to perform this verification activity. In the course of verification, 03 Corrective Action requests (CARs) and 00 Clarification Requests (CLs) and 00 Forward action request (FARs) were raised and successfully closed. The review of the Monitoring report and additional documents related to baseline and monitoring methodology; the subsequent background

investigation, follow-up interviews and PROJECT OWNERS have provided *LGAI Technological Center, S.A. (Applus+ Certification)* with sufficient evidence to verify the fulfillment of the stated criteria of VCS for verification purpose.

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1 INTRODUCTION

1.1 Objective

LGAI Technological Center, S.A.(Applus+ Certification) has been appointed by “M/s DJ Malpani” to perform the Joint validation and verification of the “Bundled Wind Power Project in Madhya Pradesh, Gujarat and Kerala by D.J. Malpani” under VCS standard and guideline. The objective of this joint validation and verification activity is to have an independent third party for the assessment of the VCS PD, emission reduction sheet and Monitoring report, and to ensure a thorough assessment of the proposed project activity against the CDM and VCS requirements. In particular;

- The project's baseline is assessed against “ACM0002 version 17.0”
- The project's monitoring plan is assessed against “ACM0002 version 17.0”
- The projects compliance with, the requirements of Article 12 of the Kyoto Protocol, the CDM Modalities and Procedures as agreed in the Marrakech Accords under decision 3/CMP.1, the annexes to this decision, subsequent decisions and guidance made by COP/MOP & CDM Executive Board and other relevant rules, including the Host Country legislation and sustainability criteria along with VCS guideline and standard version 3.7 for the project activity.
- CDM Validation and Verification Standard version 01 for the project activity.
- CDM Project Standard version 01 for the project activity
- CDM Project Cycle Procedure version 01 for the project activity.
- VCS standard v3.7 VCS guideline v3.7

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

1.2 Scope and Criteria

The scope of the Joint validation and verification is the independent and objective review of the Project Document as per VCS program guide version 3.7, VCS standard version 3.7 for the project activity and Monitoring report (MR). The PD and MR are reviewed against the relevant criteria (see 1.1) and decisions by the CDM Executive Board and VCS executive board, including the approved baseline and monitoring methodology. The validation and verification were based on the guidance given in the CDM Validation and Verification Standard version 01 for the project activity, CDM Project Standard version 01 for the project activity, CDM Project Cycle Procedure version 01 for the project activity, VCS guideline and standard version 3.7

The assessment team has employed a risk based approach to assess the completeness and accuracy of the claims and conservativeness of the assumptions in the PD and MR. The main focus of the

assessment team is to identify the significant risks for the project implementation and the generation of VERs. The validation and verification is not meant to provide any consulting towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design and monitoring report combined.

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

1.3 Level of Assurance

The verification and validation has been planned and organized to achieve a Reasonable Level of assurance as per the requirement of VCS.

1.4 Summary Description of the Project

The purpose of the project activity is to generate power using renewable energy source (wind energy) and sell the power generated to the state grid. The project activity generates electricity using wind. The generated electricity is exported to the regional grid system which is under the purview of the INDIAN electricity grid of India.

The wind power generated from the Project will be displacing the electricity generated from thermal power stations feeding into Indian grid (Indian Electricity Grid) and will be replacing the usage of diesel generators for meeting the power demand during shortage periods. Since, the wind power is Green House Gas (GHG) emissions free, the power generated will prevent the anthropogenic GHG emissions generated by the fossil fuel based thermal power stations comprising coal, diesel, furnace oil and gas. The estimation of GHG reductions by this project is limited to carbon dioxide (CO₂) only.

The proposed project activity involves the installation of Wind Power Projects. The total installed capacity of the project is 66 MW; which involves operation of Wind Turbine Generators (WTGs) in multiple states of India. The details of the project is given below:

Sl No.	Project Type	Project Capacity (in MW)	Owner of Project	Project Location	State
1	Wind	4.5 MW	D. J. Malpani	Dhar Site, Dhar	Madhya Pradesh
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The power produced displaces an equivalent amount of power from the grid, which is fed mainly by fossil fuel fired power plants. Hence, it results in reduction of GHG emissions. Average estimated annual GHG emission reductions from the project activity will be 127,207 tonnes of CO₂ and total GHG emission reductions for the chosen 10 year crediting period will be 1,272,070 tonnes of CO₂.

The Project activity is a new facility (Greenfield) and the purpose of the project activity is to generate energy electricity by the utilization of renewable wind technology and further selling the generated energy to the Indian Grid. In this process there is no consumption of any fossil fuel and hence the project does not lead to any greenhouse gas emissions. Thus, electricity would be generated through sustainable means without causing any negative impact on the environment.

In the Pre- project scenario the entire 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.

Total emission reductions achieved in this monitoring period:

During the Current Monitoring Period from 28/03/2016 to 23/12/2017 (First and last date included) the project activity has supplied 79,128 MWh of electricity, and thus contributing to the GHG reductions 76,380 tCO₂e.

In this process there is no consumption of any fossil fuel and hence the project does not lead to any greenhouse gas emissions. Thus, electricity would be generated through sustainable means without causing any negative impact on the environment.

In the Pre- project scenario the equivalent amount of electricity delivered to the grid by the project activity, would have otherwise been generated by the operation of grid-connected fossil fuel based power plants and by the addition of new generation sources.

2 VALIDATION AND VERIFICATION PROCESS

2.1 Method and Criteria

Validation and Verification Scope: The scope is defined as an independent and objective review of the Joint project design document and Monitoring report (MR). The Joint PD and MR is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords and the relevant decisions by the CDM Executive Board and VCS standard and guideline version 3.7, including the approved baseline and monitoring methodology ACM0002 version 17. The validation and verification was based on the requirements in the Validation and Verification Standard (VVS version 01) for the project activity, Project standard version 01 for the project activity, Project cycle procedure version 01 for the project activity and VCS guideline and standard version 3.7. The validation and verification is not meant to provide any consulting towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project document and the Monitoring period.

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

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

- I A desk review of the Joint project design documentation and monitoring report;
- II Follow-up interviews with project stakeholders;
- III The resolution of outstanding issues and the issuance of the final verification/ validation report and opinion.

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

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

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

Joint Validation/Verification Checklist Table 2: Requirement checklist				
Checklist Question	Reference	Comment	Draft Conclusion	Final Conclusion
The various	Gives	The section	Conclusions are presented	Conclusions are presented

requirements in Table 2 are linked to checklist questions the project should meet. The checklist is organized in several different sections. Each section is then further sub-divided. The lowest level constitutes a checklist question.	reference to documents where the answer to the checklist question or item is found.	is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.	based on the assessment of the first PD and MR version. This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR) due to non-compliance with the checklist question (See below). Clarification is used when the validation team has identified a need for further clarification. Forward action request to highlight issues related to project implementation that requires review during the first verification.	in the same manner based on the assessment of the final PD and MR version and further documents including assumptions presented in the documentation.
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Joint Validation/Verification Checklist Table 3: Resolution of Corrective Action and Clarification Requests			
Draft report clarifications and corrective action requests	Ref. to checklist question in table 1&2	Summary of project owner response	Validation/Verification conclusion
If the conclusions from the draft Validation are either a Corrective Action Request or a Clarification Request, these should be listed in this section.	Reference to the checklist question number in Table 1&2 where the Corrective Action Request or Clarification Request is explained.	The responses given by the Client or other project participants during the communications with the validation team should be summarized in this section.	This section should summarize the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".

The detail of corrective action/clarification request/ forward action request is presented as Appendix2 of this report.

Appointment of the assessment team

According to the sectoral scope / technical area and experience in the sectoral or national business environment, *LGAI Technological Center, S.A. (Applus+ Certification)*

has composed a project assessment team in accordance with the appointment rules in the internal Quality Management System of *LGAI Technological Center, S.A. (Applus+ Certification)*.

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

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

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

The sectoral scope / technical area knowledge linked to the applied methodology/ies shall be Covered by the assessment team.

Name	Role	SS Coverage	TA Coverage	Financial aspect	Host country experience
Mr. Sukanta Das	LA	YES	YES	YES	YES
Mr. Denny Xue	TR	YES	YES	YES	NA

The complete list of CVs is included as Appendix 3 of this report.

Document review

The Joint Project Document and Monitoring report 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 has been done. A complete list of all documents and evidence material reviewed is included in this report below in appendix 1

Follow-up interviews

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

Resolution of Clarification and Corrective Action Request

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

The Joint PD and MR Version 03 submitted by PP respectively serve as the basis for the final assessment presented. Additional changes to the project during the joint validation and verification process are not considered to be significant with respect to the main CDM/VCS objectives. The two CDM/VCS main objectives are the reduction of anthropogenic GHG emissions and the contribution of sustainable development to the host country.

Internal quality control

As final step of a joint validation and verification of the final documentation including the final Joint validation and verification report 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 positive validation/verification opinion and relevant documents are submitted to the VCS secretariat through the VCS web-platform

2.2 Document Review

The details of the document observed during the normal validation and verification process are listed below in appendix 1 of this report

2.3 Interviews

The site visit for the project activity were carried out from 15/01/2018 to 17/01/2018 which covers all the sites (includes all the locations) in the state of Kerala, Gujarat and Madhya Pradesh in republic of India. No sampling procedures were adopted either in document verification and all the document were cross checked to ensure conservative estimation of emission reduction. Kindly find below name of the person interviewed (during onsite and telephonic interview later) for all the sites.

PP representative: Mr. Kailas Banker- Onsite and telephonic interview

The detail of the stakeholders interviewed for each state is provided below:

Audit dates: 1. State of Madhya Pradesh: 15/01/2018

2. State of Kerala: 16/01/2018

3. State of Gujarat: 17/01/2018

DJ Malpani- 4.5 MW Wind Project at MP				
Name	Occupation	Site	District	State
Sandeep Singh	Farmer	Dhar	Dhar	Madhya Pradesh
Jatin Kumar	Villager			

DJ Malpani- 7.5 MW Wind Project at MP				
Name	Occupation	Site	District	State
Ram Kumar	Farmer	Ghatiya	Ujjain	Madhya Pradesh
Mohit	Villager			

DJ Malpani- 6 MW Wind Project at Gujarat				
Name	Occupation	Site	District	State
Jignesh Patel	Businessman	Sadla	Surendranagar	Gujarat
Suresh Shah	Villager			

DJ Malpani- 26 MW Wind Project at Gujarat				
Name	Occupation	Site	District	State
Mikesh	Farmer	Savarkundala	Amreli	Gujarat
Sandeep Patel	Villager			

DJ Malpani- 22 MW Wind Project at Kerala				
Name	Occupation	Site	District	State
Alok Rao	Villager	Kin fara	Palakkad	Kerala
Anudeep	Villager			

2.4 Site Inspections

Duration of on-site inspection: 15/01/2018 to 17/01/2018				
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.	In the state of Madhya Pradesh: Dhar and Ujjain In the state of Gujarat: Surendranagar and Amreli In the state of Kerala: Palakkad	15/01/2018 to 17/01/2018	Mr. Sukanta Das

2.5 Resolution of Findings

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

The Joint final PD and MR Version 03 submitted by PROJECT OWNERS on respectively serves as the basis for the final assessment presented. Additional changes to the project during the validation and verification process are not considered to be significant with respect to the main CDM/VCS objectives. The two CDM/VCS main objectives are the reduction of anthropogenic GHG emissions and the contribution of sustainable development to the host country.

Areas of validation and verification findings	No. of CL	No. of CAR	No. of FAR
Project design document and Monitoring report	00	01	00
Description of project activity	00	00	00
Application of selected baseline and monitoring methodology and selected standardized baseline			
Applicability of methodology and standardized baseline	00	00	00
Deviation from methodology	00	00	00
Clarification on applicability of methodology, tool and/or standardized baseline	00	00	00
Demonstration of additionality	00	01	00
Emission reductions	00	01	00

Monitoring plan	00	01	00
Local stake holders	00	01	00
NO net Harm	00	01	00
Others (please specify)-Matter related to double counting- for validation	00	01	00
Others (please specify)-Matter related to feeder details + Breakdown details+ Quantification of actual ER details- for verification	00	03	00
Total	00	Validation+ Verification: 10	00

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

2.5.1 Forward Action Requests

No FAR was raised during this joint validation and verification process

3 VALIDATION FINDINGS

3.1 Project Details

The purpose of the project activity is to generate power using renewable energy source (wind energy) and sell the power generated to the state grid. The project activity generates electricity using wind. The generated electricity is exported to the regional grid system which is under the purview of the INDIAN electricity grid of India.

The wind power generated from the Project will be displacing the electricity generated from thermal power stations feeding into Indian grid (Indian Electricity Grid) and will be replacing the usage of diesel generators for meeting the power demand during shortage periods. Since, the wind power is Green House Gas (GHG) emissions free, the power generated will prevent the anthropogenic GHG emissions generated by the fossil fuel based thermal power stations comprising coal, diesel, furnace oil and gas. The estimation of GHG reductions by this project is limited to carbon dioxide (CO₂) only.

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				Ujjain	Pradesh
3	Wind	6 MW	D. J. Malpani	Sadla Site, Surendranagar	Gujarat
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The Project activity is a new facility (Greenfield) and the purpose of the project activity is to generate energy electricity by the utilization of renewable wind technology and further selling the generated energy to the Indian Grid. In this process there is no consumption of any fossil fuel and hence the project does not lead to any greenhouse gas emissions. Thus, electricity would be generated through sustainable means without causing any negative impact on the environment.

In the Pre- project scenario the entire 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.

Assessment team checked the technical details of the WTGs from the manufactures specification. The technical details of the individual Wind turbines are as below:

The technology employed, converts wind energy to electrical energy. In wind power generation, energy of wind is converted into mechanical energy and subsequently into electrical energy. Wind power generation technology is environment friendly technology since there are no GHG emissions associated with the electricity generation. There is no transfer of technology involved in the project activity.

The project activity comprises a total of 8 WTG's of Re-Gen Power Tech make and 27 WTG's of INOX make. The commissioning details of the project activity has been mentioned in section 1.5 of the Joint VCS PD and MR. The detail of commissioning is checked from the commissioning certificate and found correct.

Technical details for VENSYS 87, 1500 KW Machine¹

¹ <http://www.regenpowertech.com/104/technical-data>

Particulars	Details
Make	Re-Gen Power tech
Rated power	1500 kW
Cut-in wind speed	3 m/s
Cut-out wind speed	22 m/s
Survival wind speed	52.5 m/s
Generator	Variable Speed Multi Pole Synchronous
Rotor Diameter	87 m
Swept area	5942 m ²
Speed Range	9 to 17.3 rpm
Hub Height	85 m
Design	Tubular, Four Sections
Foundation Type	Floating
Control of Output	Pitch Regulation
Speed Control	Variable, micro controller based
Low Voltage Ride Through (LVRT)	3 seconds
Primary Brake system	Aerodynamic
Pitch System	Electromechanical
Remote Monitoring	VPN
Wind Turbine type class	GL III B
Design Lifetime	25 years

Technical details for WT 2000 DF/100- 2 MW WTG by Inox

SR. NO.	PARTICULARS	DETAILS
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1.	Rated power	2 MW
2.	Cut-in wind speed	3 m/s
3.	Rated wind speed	11 m/s
4.	Cut-out wind speed	20 m/s
5.	Hub height	80m
6.	Diameter	100.3 m
7.	Swept area	7894 m ²
8.	Estimated design Life time	25 years.

Assessment team checked the geographical location of the Turbines via Google map and confirm that Latitude and longitude as presented in the Joint PD and MR is correct and accurate. The details of Geo-coordinates are as below:

S. No.	Project Owner	Machine ID	District	State	Latitude (N)	Longitude (E)
1	D. J. Malpani	RGP2- 09	Ujjain	Madhya Pradesh	23° 20' 16.5228"	81° 49' 10.4793"
2		RGP2- 08			23° 20' 30.7032"	81° 48' 57.2550"
3		RGP2- 18			23° 22' 04.6776"	81° 48' 13.4851"
4		RGP2- 03			23° 22' 16.2192"	81° 47' 48.1237"
5		RGP2- 07			23° 21' 23.8824"	81° 47' 38.5484"
6	D. J. Malpani	IWISL/2000/ 16-17/3826	Surendran agar	Gujarat	22° 41' 51.9612"	77° 11' 45.4457"
7		IWISL/2000/ 16-17/3829			22° 42' 9.1584"	77° 12' 20.8237"
8		IWISL/2000/			22° 41'	77° 12'

		16-17/3830			59.8704"	31.8505"
9	D. J. Malpani	IWISL/2000/ 16-17/4060	Amreli	Gujarat	21° 18' 27.5328"	77° 25' 05.4767"
10		IWISL/2000/ 16-17/4061			21° 18' 21.8484"	77° 25' 30.1157"
11		IWISL/2000/ 16-17/4062			21° 18' 29.9232"	77° 26' 02.8202"
12		IWISL/2000/ 16-17/4063			21° 18' 18.5436"	77° 26' 03.1529"
13		IWISL/2000/ 16-17/4064			21° 18' 10.5516"	77° 26' 09.6116"
14		IWISL/2000/ 16-17/4065			21° 18' 21.4776"	77° 30' 27.9626"
15		IWISL/2000/ 16-17/4066			21° 19' 48.1116"	77° 27' 17.9010"
16		IWISL/2000/ 16-17/4067			21° 19' 59.6028"	77° 27' 03.5558"
17		IWISL/2000/ 16-17/40678			21° 20' 11.4720"	77° 27' 14.2307"
18		IWISL/2000/ 16-17/4350			21° 17' 09.9168"	77° 31' 36.7340"
19		IWISL/2000/ 16-17/4489			21° 18' 21.6432"	77° 30' 27.8613"
20		IWISL/2000/ 16-17/4490			21° 19' 48.2124"	77° 27' 17.7986"
21		IWISL/2000/ 16-17/4491			21° 19' 59.6316"	77° 27' 03.6604"
22	D. J. Malpani	DJM 01	Palakkad	Kerala	10° 47' 08.8332"	76° 47' 22.4161"
23		DJM 02			10° 47'	76° 47'

					00.7296"	16.9701"
24		DJM 03			10° 46' 52.2372"	76° 47' 10.6991"
25		DJM 05			10° 46' 42.0600"	76° 47' 03.9574"
26		DJM 06			10° 46' 34.0176"	76° 47' 58.6108"
27		DJM 07			10° 46' 31.8864"	76° 47' 07.1889"
28		DJM 08			10° 46' 24.7080"	76° 47' 10.5038"
29		DJM 09			10° 46' 18.3972"	76° 47' 21.4268"
30		KIN – 23			10° 46' 08.9652"	76° 47' 47.9981"
31		KIN – 24			10° 45' 59.2416"	76° 47' 41.4237"
32		KIN – 25			10° 46' 46.9920"	76° 47' 11.7214"
33		ADD- 01			24° 14' 31.2540"	81° 37' 41.7437"
34	D. J. Malpani	ADD- 06	Dhar	Madhya Pradesh	24° 14' 45.6144"	81° 37' 28.5165"
35		TIR- 11			24° 16' 19.3368"	81° 36' 44.3202"

Assessment team checked the commissioning dates for the implementation of each WTGs in the respective states and found the same to be correct. The Commissioning details are checked against the commission certificate provided by the third party Govt agency of the respective states. The details are as below:

S. No.	Project Owner	Machine ID	DOC ²	Village	Taluka	District	State
1	D. J. Malpani	RGP2- 09	28/03/2016	Tulaheda	Ghatiya	Ujjain	Madhya Pradesh
2		RGP2- 08	29/03/2016	Tulaheda	Ghatiya		
3		RGP2- 18		Tulaheda	Ghatiya		
4		RGP2- 03		Tajpur	Mahidpur		
5		RGP2- 07		Ranaheda	Ghatiya		
6	D. J. Malpani	IWISL/2000/16-17/3826	31/03/2017	Ranipat	Muli	Surendranagar	Gujarat
7		IWISL/2000/16-17/3829					
8		IWISL/2000/16-17/3830					
9	D. J. Malpani	IWISL/2000/16-17/4060	31/03/2017	Pithavadi	Savarkundla	Amreli	Gujarat
10		IWISL/2000/16-17/4061		Bhenkara			
11		IWISL/2000/16-17/4062		Bhenkara			
12		IWISL/2000/16-17/4063		Bhenkara			
13		IWISL/2000/16-17/4064		Bhenkara			
14		IWISL/2000/16-17/4065		Senjal			
15		IWISL/2000/16-17/4066		Piyava			

² Date Of commissioning

16		IWISL/2000/ 16-17/4067	31/03/2017	Piyava			
17		IWISL/2000/ 16-17/40678	31/03/2017	Piyava			
18		IWISL/2000/ 16-17/4350	31/03/2017	Piyava			
19		IWISL/2000/ 16-17/4489		Piyava			
20		IWISL/2000/ 16-17/4490		Piyava			
21		IWISL/2000/ 16-17/4491		Piyava			
22	D. J. Malpani	DJM 01	28/03/2017	Kanjikode	Palakkad	Palakkad	Kerala
23		DJM 02					
24		DJM 03					
25		DJM 05					
26		DJM 06					
27		DJM 07					
28		DJM 08					
29		DJM 09					
30		KIN - 23					
31		KIN - 24					
32		KIN - 25					
33	D. J. Malpani	ADD- 01	31/03/2016	Navagaon	Dhar	Dhar	Madhya Pradesh
34		ADD- 06		Navagaon			
35		TIR- 11		Athar			

The project involves setting up of 66 MW of wind power project. As the Estimated GHG emission reductions or removals per year is 127,207 (tCO₂e) which is less than 300,000 tonnes of CO₂e per year, thus the project falls in the category of Project

Project Scale	
Project	Correct
Large project	

As per the requirement of VCS: The project start date is the date on which first Wind power plant was commissioned under the project activity.

Assessment team checked that the first project activity instance of the project under consideration was commissioned and power generation started on 28/03/2016. Hence this date is considered as project start date as per the requirement of VCS standard version 3.7.

Assessment team checked the Project Start Date: 28/03/2016

Assessment team checked the project crediting period:

Crediting Period Start date: 28/03/2016

Crediting Period End date: 27/03/2026

The project activity adopts renewable crediting period of 10 years period which can be renewed for maximum 2 times.

In the Pre- project scenario the entire 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. The baseline as identified in section 2.4 of the Joint PD and MR would continue to be in pre-project scenario. Assessment team also confirms that the project is in compliance with applicable local law and guidance of the host country for the implementation of renewable technology. The Project has received necessary approvals for development and commissioning for each plants from the state Nodal agencies and is in compliance to the local laws and regulations. The relevant national laws and regulations pertaining to generation of energy in India are:

- Electricity Act 2003
- National Electricity Policy 2005
- Tariff Policy 2006

The Project activity conforms to all the applicable laws and regulations in India:

- Power generation using wind energy is not a legal requirement or a mandatory option.
- There are state and sectoral policies, framed primarily to encourage wind power projects. These policies have also been drafted realizing the extent of risks involved in the projects and to attract private investments.
- The Indian Electricity Act, 2003 (May 2007 Amendment) does not influence the choice of fuel used for power generation.
- There is no legal requirement on the choice of a particular technology for power generation.

Assessment team checked the details of the following project proponent as per right of Use definition of VCS standard version 3.7 and found the details to be correct. The Project is owned by Individual investors hence it possess right of use of ER credits. The Ownership is demonstrated through the following documents.

- 1) Commissioning certificates for WTGs in the name of PP issued by respective state electricity board.
- 2) Power Purchase Agreement with respective State Electricity Board for sale of electricity by the PP

The details are as follows:

Organization name	D. J. Malpani
Contact person	Mr. Prafulla Khinvasara
Title	CEO- Renewable Power Projects
Address	Malpani House, New Nagar Road, Tal- Sangamner, Dist – Ahmednagar, Maharashtra, India
Telephone	+91 98223 22145
Email	prafulla@malpani.com

Other Entities Involved in the Project

Organization name	EKI Energy Services Limited
Contact person	Mr. Manish Dabkara
Title	MD & CEO
Address	Office No. 201, EnKing Embassy, Plot No. 48, Scheme No. 78, Part II, Vijay Nagar INDORE – 452010, India.
Telephone	+91-731-4289086
Email	manish@enkingint.org

A short description for applicability and project boundary is presented here and detailed description is provided in section 3.3.1 of this report.

Applicability condition for ACM0002 version 17 is verified (for the project activity).

- The project activity is installation of a new grid connected renewable energy power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (Greenfield plant) and hence this criterion is applicable. Assessment team confirmed the same during the site visit of the project activity.
- The proposed project activity will be an installation of a new grid connected wind power plant and hence this condition is met. Assessment team confirmed the same during the site visit of the project activity.
- The proposed project activity does not involve any capacity additions, retrofits or replacements and therefore this condition is not applicable. Assessment team confirmed the same during the site visit of the project activity.
- The proposed project activity is a grid connected wind power project. This condition is applicable only for hydro power plants and not applicable for wind projects. Hence this criterion is not applicable. Assessment team confirmed the same during the site visit of the project activity.
- The proposed project activity is a grid connected wind energy power project. This condition is applicable only for hydro power plants and not applicable for wind projects. Assessment team confirmed the same during the site visit of the project activity.
- The proposed project activity is a grid connected wind power project. This condition is applicable only for hydro power plants and not applicable for wind projects. Assessment team confirmed the same during the site visit of the project activity.
- The project activity will be installation of a new grid connected wind power project and does not involve switching from fossil fuel to renewable energy and hence this criterion is not relevant to the project activity. This project activity does not involve any biomass based power plants and hence this criterion is not applicable to the project activity. Assessment team confirmed the same during the site visit of the project activity.
- The project activity will be a new grid connected wind power plant and not a retrofits, replacement or capacity additions and therefore this criterion is not applicable to the project activity. Assessment team confirmed the same during the site visit of the project activity.

Applicability conditions of “Tool to calculate the emission factor for an electricity system as per the requirement of ACM0002 version 17.

- OM, BM and CM are estimated using the tool for calculating baseline emissions. Applicability criteria are met. Assessment team confirmed the same during the document review of the revised joint PD and MR version 02
- As the project activity is grid connected, this condition is applicable and the emission factor has been calculated accordingly. Assessment team confirmed the same during the document review of the revised joint PD and MR version 02
- The project activity will be located in India, a non-Annex I country. Therefore, this criterion is not applicable for the project activity. Assessment team confirmed the same during the document review of the revised joint PD and MR Version 02 and also during the validation site visit.
- The project activity will be grid connected renewable energy project and CO₂ emission factor is not considered for biofuels. Assessment team confirmed the same during the document review of the revised joint PD and MR Version 02 and also during the validation site visit

The project activity qualifies as Type I during every year of the crediting period in accordance with applicable provisions for project activity eligibility as discussed above. Also the total installed capacity of project activity is 66 MW which is applicable as per large scale project activities methodology ACM0002: Grid-connected electricity generation from renewable sources Version 17.0. The project capacity will always remain the same and hence the project activity will always be large scale project activities throughout the crediting period and thereafter.

Verification of the project boundary:

Project boundary has been ascertained and confirmed during the site visit using para 21 of ACM0002 (Version 17.0)– “The spatial extent of the project boundary includes the project power plant and all power plants connected physically to the electricity system that the CDM project power plant is connected to”.

Hence the project boundary includes the renewable energy power turbine generator, sub-stations, grid and all power plants connected to grid. The proposed project activity will evacuate power to the grid. The boundary also extends to the project power plant and all power plants connected physically to the electricity system that the VCS project power plant is connected to”.

The calculation of net electricity supplied to grid is under purview of state electricity board and project activity Owner or project activity Implementer does not have any control on it. Thus for project activity net electricity supplied to grid is the monitoring parameter which is used for ER calculations.

It is to be noted that metering arrangement is under control of state electricity board and PP do not have any control on it.

The sources and GHG gases involved for proposed Project activity are as below

Source		Gas	Included	Justification/Explanation
Baseline	CO ₂ emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity.	CO ₂	Yes	Major emission sources.
		CH ₄	No	Excluded for simplification. This is conservative
		N ₂ O	No	Excluded for simplification. This is conservative
Project activity	For geothermal power plants, fugitive emissions of CH ₄ and CO ₂ from non-condensable gases contained in geothermal steam	CO ₂	No	A project activity instance does not involve any Geothermal Power plant. Hence not applicable
		CH ₄	No	A project activity instance does not involve any Geothermal Power plant. Hence not applicable
		N ₂ O	No	A project activity instance does not involve any Geothermal Power plant. Hence not applicable
	CO ₂ emissions from combustion of fossil fuels for electricity generation in solar thermal power plants and geothermal power plants	CO ₂	No	A project activity instance does not involve solar thermal or geothermal power plants. Hence not applicable
		CH ₄	No	A project activity instance does not involve solar thermal or geothermal power plants. Hence not applicable
		N ₂ O	No	A project activity instance does not involve solar thermal or geothermal power plants. Hence not applicable
	For hydro power plants, emissions of CH ₄ from the reservoir	CO ₂	No	A project activity instance does not involve hydro power plants. Hence neglected

The project activity involved setting up of a wind plant to harness the power of wind to produce electricity and supply to grid. In the absence of the group project activity, the equivalent amount of power would have been supplied by the state grid (part of INDIAN grid), which is fed mainly by fossil fuel fired plants.

Hence, the baseline for the project activity is the equivalent amount of power from the INDIAN grid.

During conceptualization of the project activity, board of directors of the project proponents considered the VCS revenue to improve the project financials.

In continuation to the board decision, PROJECT OWNERS issued the respective purchase order for the supply of Wind turbines.

Joint PD and MR mentioned that the project would not be economically or financially feasible without the revenue from the sale of Verified emission reductions (VERs). The claim of the project developer has been assessed by the Validation Team through the following steps

a) Suitability of investment analysis, financial indicator and benchmark:

Assessment team checked that in line with VCS Standard version 3.7, the additionality of the Project activity is ascertained in line with the applicable guidance from the UNFCCC. The demonstration of additionality for the proposed Project activity is being carried out in accordance with the additionality tool provided by the UNFCCC i.e. “Tool for demonstration and assessment of Additionality” Version 07.0.. The tool provides a step-wise approach to demonstrate additionality which is displayed below:

Step 0: Demonstration whether the proposed project activity is the first-of-its-kind

The proposed project activity is not the first-of-its-kind. Hence not applicable.

Step 1: Identification of alternatives to the project activity consistent with current laws and regulations

Sub-step 1a: Define alternatives to the project activity:

Identify realistic and credible alternative(s) available to the project participants or similar project developers that provide outputs or services comparable with the proposed VCS project activity.

The purpose of the project activity is to generate electrical power using wind energy and feed the electricity generated to the grid. Hence, the following alternatives are considered:

Alternative 1: The proposed project activity not undertaken as a VCS project activity.

The PP could proceed with the implementation of the project without Carbon credit benefits. The electricity produced from the renewable energy project would have been sold to the grid. This is in compliance with all applicable legal and regulatory requirements and can be a part of the baseline. However, the Project activity is not feasible without revenues from sale of Carbon Credits. This argument has been discussed in step 2 of the Additionality section.

Alternative 2: No proposed project activity and equivalent amount of energy would have been produced by the grid electricity system through its currently running power plants and by new capacity addition to the grid i.e. Continuation of the present situation.

The PP would have continued without investment in Project activity with usual business activities. The grid would continue with the fossil fuel based power projects and this would result in GHG emissions. Hence, the new capacity add-on from a fossil fuel based power plant is appropriate, realistic & credible baseline alternative for the project activity.

Outcome of Sub-step 1a: All the realistic alternatives for the project activity have been enlisted above.

Sub-step 1b: Consistency with mandatory laws and regulations:

The alternative(s) shall be in compliance with all applicable legal and regulatory requirements, even if these laws and regulations have objectives other than GHG reductions, e.g. to mitigate local air pollution. (This sub-step does not consider national and local policies that do not have legally-binding status.).

The relevant national laws and regulations pertaining to generation of energy in India are:

- Electricity Act 2003
- National Electricity Policy 2005
- Tariff Policy 2006

The Project activity conforms to all the applicable laws and regulations in India:

- Power generation using wind energy is not a legal requirement or a mandatory option.
- There are state and sectoral policies, framed primarily to encourage wind power projects. These policies have also been drafted realizing the extent of risks involved in the projects and to attract private investments.
- The Indian Electricity Act, 2003 (May 2007 Amendment) does not influence the choice of fuel used for power generation.
- There is no legal requirement on the choice of a particular technology for power generation.

Outcome of Sub-step 1b: Hence, both the alternatives enlisted above are found to comply with the mandatory laws and regulations taking into account the enforcement of the legislations in the region or country and EB decisions on national and/or sectoral policies and regulations. However, Alternative 2 has been selected as the appropriate baseline alternative for this project activity.

Step 2: Investment analysis

Determine whether the proposed project activity is economically or financially less attractive than at least one other alternative, identified in step 1, without the revenue from the sale of emission reductions credits. To conduct the investment analysis, use the following sub-steps:

Sub-step 2a: Determine appropriate analysis method and Sub-step 2b (Option III): Apply benchmark analysis

Project developer had demonstrated that the financial returns of the proposed VCS project activity would be insufficient to justify the required capital investment as per VVS version 01.0 for the project activity. In the Initial PD version 01 PROJECT OWNERS has adopted a conservative approach to identify the benchmark for the project activity. The project is earning revenue from the installation of the project activity. Thus simple cost analysis is not appropriate. Also in the absence of the project activity grid electricity would have been the obvious choice for the Project which requires no investment. Hence investment comparison analysis is also not appropriate for the project activity. Therefore, benchmark

analysis (Option III) is used for the project activity as per project type and decision-making context. Therefore, the Expected return on equity is considered appropriate benchmark. Accordingly, the post-tax Equity IRR has been considered as the relevant financial indicator for the project activity. Moreover, the financial indicator selected by the PP is correct based on the fact that tool do not restrict the PP to either use project IRR or Equity IRR. This is under the prerogative of the PP to select appropriate indicator based on his preferences to know the IRR based on his equity investment or debt investment. The same is thus acceptable to the assessment team. Assessment team however checked the Equity IRR calculation and thus found that input assumptions used for the calculation of Equity IRR is applicable at the time of investment decision of the project and thus is in accordance with the relevant guideline of the tool.

Choice of Benchmark:

As per Investment Analysis tool, Required/expected returns on equity are appropriate benchmarks for an equity IRR. The Equity IRR is considered as the financial indicator and the benchmarks used is cost of equity. Thus assessment team confirms that the benchmarks used are applicable to the project activity and the type of IRR calculation presented.

(i) For the wind projects installed by D.J. Malpani in Madhya Pradesh and Gujarat Sites

At the time of decision made of project activity, Version 06 of methodological tool "Investment Analysis" (EB 85 Annex 12) was the latest available tool to PP, hence PP has considered the same tool for default value of return on equity. The default value of Return on Equity for Group-1 projects in India is 11.10%.

(i) For the wind project installed by D.J. Malpani in Kerala Site

At the time of decision making the investment analysis (Annex 5, EB 92) guideline was available. Hence, the value for cost of equity is selected from Annex 5 of EB 92. The default value of Return on Equity for Group-1 projects in India is **11.06%**.

As per the above mentioned document, "In situations where an investment analysis is carried out in nominal terms, project participants can convert the real term values provided in the table below to nominal values by adding the inflation rate. The inflation rate shall be obtained from the **inflation forecast of the central bank of the host country for the duration of the crediting period**. If this information is not available, the target inflation rate of the central bank shall be used. If this information is also not available, then the average forecasted inflation rate for the host country published by the IMF (International Monetary Fund World Economic Outlook) or the World Bank for the next five years after the start of the project activity shall be used".

Default Value Benchmark:

(i) For the wind projects installed by D.J. Malpani in Madhya Pradesh and Gujarat Sites

As mentioned in EB 85 Annex 12 the cost of equity is determined by selecting the values provided in the Appendix, i.e. Default values for cost of equity (expected return on equity) is presented below:

Appendix A in EB 85 Annex 12 specifies default value of expected return on equity in real terms for Energy Industries (Group 1) in India = 11.10%

(ii) For the wind project installed by D.J. Malpani in Kerala Site

As mentioned in EB 92 Annex 5 the cost of equity is determined by selecting the values provided in the Appendix, i.e. Default values for cost of equity (expected return on equity) is presented below:

Appendix A in EB 92 Annex 5 specifies default value of expected return on equity in real terms for Energy Industries (Group 1) in India = 11.06%

The Required return on equity (benchmark) was computed in the following manner:

$$\text{Nominal Benchmark}^3 = \{(1 + \text{Real Benchmark}) * (1 + \text{Inflation rate})\} - 1$$

Where:

- Default value for Real Benchmark = 11.10% (as per Appendix of Annex 12, EB 85)

$$= 11.06\% \text{ (as per Appendix of Annex 5, EB 92)}$$

- Inflation Rate forecast for by Reserve Bank of India (RBI) (i.e. Central Bank of India) for India & in case where RBI Inflation forecast was not available Average Inflation rate forecast for India has been sourced from IMF web site.

Benchmark estimation:

(i) For the wind projects installed by D.J. Malpani in Madhya Pradesh and Gujarat Sites

Appendix in EB 85, Annex 12 specifies default value of expected return on equity in real terms for Energy Industries (Group 1) in India = 11.10%

(ii) For the wind project installed by D.J. Malpani in Kerala Site

Appendix in EB 92, Annex 5 specifies default value of expected return on equity in real terms for Energy Industries (Group 1) in India = 11.06%

Inflation Forecast for India as per RBI website is considered for benchmark calculation.

Since RBI publishes the inflation forecast for 5 years and 10 years, PP has considered the maximum 10 year inflation considering the renewable crediting period of total 30 years.

The decision dates for implementing the wind projects by D.J. Malpani are provided below and the benchmark is determined based on this decision made date.

³ As per Pg. 320 of Corporate Finance, Second Edition of Aswath Damodaran

For 4.5 MW wind project at Dhar site, Madhya Pradesh

Benchmark Calculations	Value	Sources Link or Title	Document Date	Decision Making Date
Default Value for India as per UNFCCC guidelines	11.10%	EB 85 Annex 12, Version 06 of methodological tool "Investment Analysis" Table 1 Appendix	24/07/2015	30/01/2016
Inflation forecast (WPI Mean) as per RBI for 10 yrs	3.80%	Table A.9: Annual Average Percentage Change ⁴	01/12/2015	
Benchmark (with 10 yrs Forecast)	15.32%			

For 7.5 MW wind project at Ghatiya site, Madhya Pradesh

Benchmark Calculations	Value	Sources Link or Title	Document Date	Decision Making Date
Default Value for India as per UNFCCC guidelines	11.10%	EB 85 Annex 12, Version 06 of methodological tool "Investment Analysis" Table 1 Appendix	24/07/2015	30/01/2016
Inflation forecast (WPI Mean) as per RBI for 10 yrs	3.80%	Table A.9: Annual Average Percentage Change ⁵	01/12/2015	
Benchmark (with 10 yrs Forecast)	15.32%			

For 6 MW wind project at Sadla site, Gujarat

Benchmark Calculations	Value	Sources Link or Title	Document Date	Decision Making Date
Default Value for India as per	11.10%	EB 85 Annex 12, Version 06 of methodological tool	24/07/2015	20/09/2016

⁴ <https://www.rbi.org.in/Scripts/PublicationsView.aspx?id=16710>

⁵ <https://www.rbi.org.in/Scripts/PublicationsView.aspx?id=16710>

UNFCCC guidelines		"Investment Analysis" Table 1 Appendix		
Inflation forecast (WPI Mean) as per RBI for 10 yrs	3.90%	Table A.9: Annual Average Percentage Change ⁶	09/08/2016	
Benchmark (with 10 yrs Forecast)	15.43%			

For 26 MW wind project at Savarkundla site, Gujarat

Benchmark Calculations	Value	Sources Link or Title	Document Date	Decision Making Date
Default Value for India as per UNFCCC guidelines	11.10%	EB 85 Annex 12, Version 06 of methodological tool "Investment Analysis" Table 1 Appendix	24/07/2015	20/09/2016
Inflation forecast (WPI Mean) as per RBI for 10 yrs	3.90%	Table A.9: Annual Average Percentage Change ⁷	09/08/2016	
Benchmark (with 10 yrs Forecast)	15.43%			

For 22 MW wind project at Kinfara site, Kerala

Benchmark Calculations	Value	Sources Link or Title	Document Date	Decision Making Date
Default Value for India as per UNFCCC guidelines	11.06%	EB 92 Annex 5, Version 06 of methodological tool "Investment Analysis" Table 1 Appendix	24/07/2015	05/12/2016

⁶ <https://www.rbi.org.in/Scripts/PublicationsView.aspx?id=17119>

⁷ <https://www.rbi.org.in/Scripts/PublicationsView.aspx?id=17119>

Inflation forecast (WPI Mean) as per RBI for 10 yrs	3.98%	Table A.9: Annual Average Percentage Change ⁸	09/08/2016	
Benchmark (with 10 yrs Forecast)	15.48%			

Sub-step 2c: Calculation and comparison of financial indicators (only applicable to Options II and III):

The Post tax Equity IRR is evaluated for the entire lifetime of the project activity, i.e. 25 years. It is calculated based on the cash outflows from and cash inflows into the project activity.

The IRR and Benchmark analysis are calculated in excel spreadsheet which is being checked and found correct by the assessment team.

Based on result of IRR excel spreadsheets, equity IRR is less than Benchmark.

This substantiates that the investment is not financially attractive (Equity IRR for the project activity is less than the Benchmark). Thus it can be easily concluded that project activity is additional & is not business as usual scenario.

b) Parameters and assumptions used:

The project activity is a renewable source of electricity generation and supplies the electricity to the INDIAN Electricity grid. The key parameters which determine the Equity IRR of the project activity are project cost, PLF and profitability estimates.

In the revised Joint PD and MR version 02, the project cost is based on the **offer letters**. The offer letters for project activity of each state is checked by the assessment team and found that the value as mentioned in IRR sheet is correct and appropriate for the region.

As offer letter were available to the individual project owner at the time of investment decision hence the same is deemed appropriate for IRR calculation. The details of project cost as per offer letter are as follows:

Site Name	Name of the Investor/Owner	Project Capacity (MW)	Project Cost (In Million)	Offer Letter Date
Dhar	D. J. Malpani	4.5 MW	315	20/10/2015
Ghatiya	D. J. Malpani	7.5 MW	525	20/10/2015

⁸ <https://www.rbi.org.in/Scripts/PublicationsView.aspx?id=17390>

Sadla	D. J. Malpani	6 MW	412.5	01/09/2016
Savarkundala	D. J. Malpani	26 MW	1787.5	01/09/2016
Kinfara	D. J. Malpani	22 MW	1457.5	25/11/2016

Validation team checked the offer letters of the project activity and found that consideration of the project cost in revised PDD version 02 is correct and it is in line with investment guideline as well as in compliance to VVS version 01.0 for the project activity. Hence, the project cost consideration is justified.

Moreover, the **actual cost of the project activity** is provided below and considering the same the project still do not breach the benchmark as detailed out in sensitivity analysis. If the actual cost is considered IRR still reduce and hence the same is considered conservative.

Site Name	Name of the Investor/Owner	Project Capacity (MW)	Project Cost (In Million)	Purchase Order Date
Dhar	D. J. Malpani	4.5 MW	297	25/02/2016
Ghatiya	D. J. Malpani	7.5 MW	486	25/02/2016
Sadla	D. J. Malpani	6 MW	360.79	28/10/2016
Savarkundala	D. J. Malpani	26 MW	1563.41	28/10/2016
Kinfara	D. J. Malpani	22 MW	1364	23/02/2017

Assessment of Plant Load Factor (PLF):

PROJECT OWNERS considered the Plant load factor from respective State electricity regulatory commission report of the state/3rd party report (available at the time of investment decision= Third party Engineering company) (to adhere as per Annex 11 EB 48), for expected electricity generation estimation. The third party engineering company contracted by the PROJECT OWNERSs for this project activity. PROJECT OWNERS has submitted the copies of the PLFs estimation report to the assessment team.

Validation team assessed the PLF assessment report and found that the PLF estimation by 3rd party engineering company is in line with Para 3 (b) Annex 11, EB 48 and acceptable to the assessment team. For the IRR evaluation PLF available at decision making is considered. For Emission reduction calculation PLF available at the decision making in considered. Assessment team confirms that all the project owners adhere to the guideline of Annex 11 EB 48.

The detail of PLF is as below:

Site Name	Name of the Investor/Owner	Project Capacity (MW)	PLF (%)= 3 rd party engineering company	Date
Dhar	D. J. Malpani	4.5 MW	19.7%	12/12/2015
Ghatiya	D. J. Malpani	7.5 MW	19.7%	12/12/2015

Sadla	D. J. Malpani	6 MW	24.5%	10/09/2016
Savarkundala	D. J. Malpani	26 MW	24.5%	10/09/2016
Kinfara	D. J. Malpani	22 MW	22%	18/11/2016

Assessment of Electricity Tariff:

The tariff is considered from SERC order for the project activity of each state available to them at the time of decision making.

Validation team assessed the tariff and found that same value was available during decision making and in conformity with investment guideline and VVS version 1.0.

Furthermore, assessment team has also checked the actual tariff in the power purchase agreement signed for further substantiation as these values are available during the validation stage. The IRR still do not cross the benchmark. The tariff details for individual project owners are given below:

Site Name	Name of the Investor/Owner	Tariff Rate (as per SERC= State electricity regulatory commission)	Tariff Rate (as per Power purchase agreement= PPA)	PPA Date
Dhar	D. J. Malpani	5.92	-	Not Signed
Ghatiya	D. J. Malpani	5.92	5.92	13/07/2016
Sadla	D. J. Malpani	4.19	4.19	03/11/2016
Savarkundala	D. J. Malpani	4.19	4.19	09/11/2016
Kinfara	D. J. Malpani	5.76	-	Not Signed

Assessment of O& M cost:

PROJECT OWNERS considered the Operation and Maintenance (=O&M) cost from the offer letters for the project of respective states for the same PP. The Offer letter has been used in the financial calculation as same was available during decision making and hence applicable. According to Investment guideline, the cost should be based on the input parameters available at the time of decision making and the project owners has submitted offer letters supporting this consideration. Therefore, considering the above assessment, validation team concluded that the O&M cost considered from respective offer letters in the computation of financial indicator is in conformity with guidance of VVS version 01. The detail of the O&M cost for individual project owners is given below:

Site Name	Name of the Investor/Owner	Project Capacity (MW)	O&M (In Million) (Without tax)	Date
Dhar	D. J. Malpani	4.5 MW	4.8	20/10/2015
Ghatiya	D. J. Malpani	7.5 MW	8	20/10/2015

Sadla	D. J. Malpani	6 MW	6.6	01/09/2016
Savarkundala	D. J. Malpani	26 MW	28.6	01/09/2016
Kinfara	D. J. Malpani	22 MW	24.2	25/11/2016

The actual Signed O&M agreements were also signed for individual PP and the values are mentioned in the below table. The IRR is still below the benchmark

Site Name	Name of the Investor/Owner	Project Capacity (MW)	O&M (In Million) (Without tax)	Date
Dhar	D. J. Malpani	4.5 MW	-	Not Signed
Ghatiya	D. J. Malpani	7.5 MW	-	Not Signed
Sadla	D. J. Malpani	6 MW	5.25	19/01/2017
Savarkundala	D. J. Malpani	26 MW	22.75	19/01/2017
Kinfara	D. J. Malpani	22 MW	-	Not Signed

Assessment of Tax computation:

The project developer has adopted book depreciation rates as per Schedule XIV of the Companies Act, 1956 for computing book profit and Income Tax Act 1961 stipulated for income tax calculation, which are in conformity with the accepted accounting principles adopted by the company and income tax laws in the host country. The block of assets has been computed for depreciation purpose as per the accepted accounting principles. Tax liability has been calculated as per the income tax rules and the rulings given. In computing the income tax liability, the project developers have considered Tax holiday (u/s 80IA of the Income Tax Act, 1961). Accelerated depreciation on plant and machinery is also sourced from IT act. The tax rates assumed corresponds to the tax rate prevailing at the time of taking decision (conformity to Investment guideline). Hence, these assumptions are appropriate during decision making context.

Cross checking parameters:

The cost of wind turbines, electricity tariff, depreciation, Salvage value and tax rate have been checked with Offer letters, tariff order, Income Tax Act, power purchase agreement.

Name of the parameter	DOE assessment			
Project Cost	The proposed project activity consist of five different project site of the same investor			
	Name of the Investor/Owner	Project Capacity (MW)	Project Cost (In Million)	Project cost in Million per MW

	D. J. Malpani	4.5	315	70
	D. J. Malpani	7.5	525	70
	D. J. Malpani	6	412.5	68.75
	D. J. Malpani	26	1787.5	68.75
	D. J. Malpani	22	1457.5	66.25

The project cost has been considered from Offer Letter and was available at the time decision made for the project activity.

The DOE has also checked the actual cost of the each project site from Purchase Order and found that few project sites, the reduction in project cost is within threshold limit of sensitivity analysis. Since the comparison is done with actual project cost and hence decrease of the project cost in future is not possible. Thus the project activity is additional with actual project cost. The PO has been checked for actual project cost.

Site Name	Name of the Investor/Owner	Project Capacity (MW)	Project Cost (In Million)- Actual from PO	Project Cost (In Million) per MW- Actual from PO
Dhar	D. J. Malpani	4.5	297	66
Ghatiya	D. J. Malpani	7.5	486	64.8
Sadla	D. J. Malpani	6	360.79	60.1
Savarkundala	D. J. Malpani	26	1563.41	60.1
Kinfara	D. J. Malpani	22	1364	62

The difference in actual project cost for different project site is due to time difference, manufacturer, different EPC contractor, negotiation skills of individual PP etc.

The assessment team also checked different states tariff orders and found that project cost considered for project is found to be appropriate.

Based on sectoral scope expert and local knowledge, the project cost considered as per Offer Letter for the proposed project activity is found to be appropriate for wind projects. Also since the actual cost is available to DOE and IRR is still within benchmark and thus the same is acceptable.

The IRR as per the assumption from the Offer Letter is as follows:

Site Name	Name of the Investor/Owner	Project Capacity (MW)	Project Cost (In Million)	IRR	Benchmark
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	Dhar	D. J. Malpani	4.5	315	6.75%	15.32%
	Ghatiya	D. J. Malpani	7.5	525	7.0%	15.32%
	Sadla	D. J. Malpani	6	412.5	5.90%	15.43%
	Savarkundala	D. J. Malpani	26	1787.5	5.98%	15.43%
	Kinfara	D. J. Malpani	22	1457.5	11.03%	15.48%
	The IRR as per the actual project cost is defined as below:					
	Site Name	Name of the Investor/Owner	Project Capacity (MW)	Actual project cost as per the PO	IRR	Benchmark
	Dhar	D. J. Malpani	4.5	297	7.36%	15.32%
	Ghatiya	D. J. Malpani	7.5	486	7.82%	15.32%
	Sadla	D. J. Malpani	6	360.79	7.26%	15.43%
	Savarkundala	D. J. Malpani	26	1563.41	7.33%	15.43%
	Kinfara	D. J. Malpani	22	1364	12.20%	15.48%
	As described above actual project cost with benchmark, the project is still additional. Since the comparison is done with actual project cost, the increase of the IRR in future is not possible. Thus assessment team is of the opinion that project is still additional with the consideration of actual project cost for the project activity.					
O&M cost and Escalation in the operational expense =5(%)- Standard practice in India	The proposed project activity consist of five different project site of the same investor					
	Name of the Investor/Owner		Project Capacity (MW)	O&M (In Million)		
	D. J. Malpani		4.5	4.8		
	D. J. Malpani		7.5	8		
	D. J. Malpani		6	6.6		
	D. J. Malpani		26	28.6		
	D. J. Malpani		22	24.2		
	The O&M cost has been considered from Offer Letter and was available at the time decision made for the project activity.					
	The DOE has also checked the actual O&M contract for each project site and found the					

changes in O&M cost is within threshold limit. Thus the project activity is additional with actual O&M cost.

Site Name	Name of the Investor/Owner	Project Capacity (MW)	O&M (In Million) (Without tax)- Actual
Dhar	D. J. Malpani	4.5	
Ghatiya	D. J. Malpani	7.5	
Sadla	D. J. Malpani	6	5.25
Savarkundala	D. J. Malpani	26	22.75
Kinfara	D. J. Malpani	22	

Even after consideration of O&M cost as zero, the project activity is additional.

The assessment team also checked different states tariff orders and found that O&M cost and its escalation considered for project is found to be appropriate.

IRR value as per the assumptions from the Offer Letter is as below:

Name of the Investor/Owner	Project Capacity (MW)	O&M (In Million)	IRR	Benchmark
D. J. Malpani	4.5	4.8	6.75%	15.32%
D. J. Malpani	7.5	8	7.0%	15.32%
D. J. Malpani	6	6.6	5.90%	15.43%
D. J. Malpani	26	28.6	5.98%	15.43%
D. J. Malpani	22	24.2	11.03%	15.48%

IRR value based on the actual O&M agreements signed is as below:

Site Name	Name of the Investor/Owner	Project Capacity (MW)	O&M (In Million) (Without tax)- Actual	IRR	Benchmark
Dhar	D. J. Malpani	4.5			15.32%
Ghatiya	D. J. Malpani	7.5			15.32%
Sadla	D. J. Malpani	6	5.25	8.01%	15.43%
Savarkundala	D. J. Malpani	26	22.75	8.07%	15.43%

	Kinfara	D. J. Malpani	22			15.48%																								
	Even after consideration of O&M cost as zero, the project activity is additional. Benchmark for the project as described above along with actual O&M value, the project is still additional. Based on sectoral scope expert and local knowledge, the project O&M cost and its escalation considered as per Offer Letter for the proposed project activity is found to be appropriate for wind projects. Also since the O&M cost is available to DOE and IRR is still within benchmark and thus the same is acceptable.																													
Tariff	The proposed project activity consist of five different project site of same Investor The Tariff rate has been considered from respective state tariff order and was available at the time decision made for the project activity. The DOE has also checked the actual PPA for each project site and found there are no changes in tariff rate and is within threshold limit. Thus the project activity is additional with actual Tariff rate. The projects for which PPA is not signed yet, the actual tariff rate will be same as per SERC tariff order. Thus for Dhar and Kinfara, same SERC tariff is expected. <table><tr><th>Site Name</th><th>Name of the Investor/Owner</th><th>Tariff Rate (as per SERC)</th><th>Tariff Rate (as per PPA)</th></tr><tr><td>Dhar</td><td>D. J. Malpani</td><td>5.92</td><td>-</td></tr><tr><td>Ghatiya</td><td>D. J. Malpani</td><td>5.92</td><td>5.92</td></tr><tr><td>Sadla</td><td>D. J. Malpani</td><td>4.19</td><td>4.19</td></tr><tr><td>Savarkundala</td><td>D. J. Malpani</td><td>4.19</td><td>4.19</td></tr><tr><td>Kinfara</td><td>D. J. Malpani</td><td>5.76</td><td>-</td></tr></table> The tariff order of respective state has been checked and found that tariff rate considered for the project activity are appropriate. http://www.mperc.nic.in/26032013-Wind-tariff-order.pdf http://www.gercin.org/uploaded/document/07c74229-5dc4-4406-89d3-25a82fa0931b.pdf http://www.erckerala.org/regulations/KSERC%20(Renewable%20Energy)%202015%20-11.11.15.pdf The tariff considered is levellised tariff and hence there is no any escalation. This is found to be appropriate and found to be accepted. IRR value as per the actual PPA signed between Individual project owners and State electricity Board is as below:						Site Name	Name of the Investor/Owner	Tariff Rate (as per SERC)	Tariff Rate (as per PPA)	Dhar	D. J. Malpani	5.92	-	Ghatiya	D. J. Malpani	5.92	5.92	Sadla	D. J. Malpani	4.19	4.19	Savarkundala	D. J. Malpani	4.19	4.19	Kinfara	D. J. Malpani	5.76	-
Site Name	Name of the Investor/Owner	Tariff Rate (as per SERC)	Tariff Rate (as per PPA)																											
Dhar	D. J. Malpani	5.92	-																											
Ghatiya	D. J. Malpani	5.92	5.92																											
Sadla	D. J. Malpani	4.19	4.19																											
Savarkundala	D. J. Malpani	4.19	4.19																											
Kinfara	D. J. Malpani	5.76	-																											

	<table><tr><th>Site Name</th><th>Name of the Investor/Owner</th><th>Tariff Rate (as per PPA)</th><th>IRR</th></tr><tr><td>Dhar</td><td>D. J. Malpani</td><td>5.92</td><td>6.75%</td></tr><tr><td>Ghatiya</td><td>D. J. Malpani</td><td>5.92</td><td>7.0%</td></tr><tr><td>Sadla</td><td>D. J. Malpani</td><td>4.19</td><td>5.90%</td></tr><tr><td>Savarkundala</td><td>D. J. Malpani</td><td>4.19</td><td>5.98%</td></tr><tr><td>Kinfara</td><td>D. J. Malpani</td><td>5.76</td><td>11.03%</td></tr></table> Since the IRR is still below benchmark with the consideration of Actual Power purchase agreement signed which is valid for total operational lifetime of the project, assessment team confirms that the project is still additional with actual Tariff rate. Moreover, in the above table the order from State electricity tariff order is checked and it is confirmed that PPA signed with the rate as mentioned in the Tariff order and hence increase of the same is not possible. Based on sectoral scope expert and local knowledge, the project tariff rate considered as per state tariff order for the proposed project activity is found to be appropriate for wind projects.	Site Name	Name of the Investor/Owner	Tariff Rate (as per PPA)	IRR	Dhar	D. J. Malpani	5.92	6.75%	Ghatiya	D. J. Malpani	5.92	7.0%	Sadla	D. J. Malpani	4.19	5.90%	Savarkundala	D. J. Malpani	4.19	5.98%	Kinfara	D. J. Malpani	5.76	11.03%
Site Name	Name of the Investor/Owner	Tariff Rate (as per PPA)	IRR																						
Dhar	D. J. Malpani	5.92	6.75%																						
Ghatiya	D. J. Malpani	5.92	7.0%																						
Sadla	D. J. Malpani	4.19	5.90%																						
Savarkundala	D. J. Malpani	4.19	5.98%																						
Kinfara	D. J. Malpani	5.76	11.03%																						
PLF	The proposed project activity consist of five different project site of same investor <table><tr><th>Name of the Investor/Owner</th><th>Project Capacity (MW)</th><th>PLF (%)</th></tr><tr><td>D. J. Malpani</td><td>4.5</td><td>19.7%</td></tr><tr><td>D. J. Malpani</td><td>7.5</td><td>19.7%</td></tr><tr><td>D. J. Malpani</td><td>6</td><td>24.5%</td></tr><tr><td>D. J. Malpani</td><td>26</td><td>24.5%</td></tr><tr><td>D. J. Malpani</td><td>22</td><td>22%</td></tr></table> Validation team assessed the 3rd Party PLF Report. Same report has been used in the financials and the emission reduction calculation. PLF estimation by 3rd party engineering company is in line with Para 3 (b) Annex 11, EB 48 and acceptable to the assessment team. The tariff order of respective state has been checked and found that PLF considered for the project activity in within the range of sensitivity analysis and found to be appropriate. http://www.mperc.nic.in/26032013-Wind-tariff-order.pdf http://www.gercin.org/uploaded/document/07c74229-5dc4-4406-89d3-25a82fa0931b.pdf http://www.erckerala.org/regulations/KSERC%20(Renewable%20Energy)%202015%20-11.11.15.pdf Based on sectoral scope expert and local knowledge, the project PLF considered as per 3rd Party PLF Report for the proposed project activity is found to be appropriate for wind projects.	Name of the Investor/Owner	Project Capacity (MW)	PLF (%)	D. J. Malpani	4.5	19.7%	D. J. Malpani	7.5	19.7%	D. J. Malpani	6	24.5%	D. J. Malpani	26	24.5%	D. J. Malpani	22	22%						
Name of the Investor/Owner	Project Capacity (MW)	PLF (%)																							
D. J. Malpani	4.5	19.7%																							
D. J. Malpani	7.5	19.7%																							
D. J. Malpani	6	24.5%																							
D. J. Malpani	26	24.5%																							
D. J. Malpani	22	22%																							

	NO further assessment is required as the Values are directly procured from Income Tax Act, 1961 which is standard guideline for Tax value in India.
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The documents supporting the financial calculations, in the opinion of Validation Team, are therefore authentic and conform to the guidance given by EB. The PD having been incorporated, the input costs considered conform to guidance on investment analysis issued by EB. All the input parameters considered in computation, the basis, and correctness and appropriate thereof are checked and found correct.

Assessment of correctness of computation:

The assessment involved checking the data input taken from Offer letters, power purchase agreement, tariff order, adoption of correct accounting principle and arithmetical accuracy. Validation Team checked the documents and ensured that appropriate input has been taken in the project cost and projections. The arithmetical accuracy was also found to be correct.

The equity IRR has been computed for a period of 25 years (=Operational lifetime of the project (for wind), which is the life time of the project and is in conformity with the Investment guideline. As required by Investment guideline the expected realization on the sale of assets at the end of the operating life has been taken as salvage value in the terminal year. In computing the IRR, the project developer has taken into account profit after tax, depreciation tax shield and salvage value (in the terminal year). The principle adopted conforms to the accepted accounting and taxation principles.

Validation team also confirms that rest of the input parameters are considered appropriately and are in line with guidance appendix of EB85 Annex 12. Therefore, from the above arguments/ justifications it is evident that the project is not business as usual scenario and requires VCS benefits to sustain.

Sensitivity analysis:

The Guidance Investment analysis requires the robustness of the conclusion arrived at to be proved through a sensitivity analysis by varying the critical assumptions to a reasonable variation. The project developer has identified Plant Load Factor (PLF), Project cost, Electricity tariff and O&M cost as critical assumptions. These critical parameters constitute more than 20% of either total project costs or total project revenues.

Since the project cost is being taken as per the Offer letter, being available at the time of investment making decision, hence the cost is subject to variation. However the same can be compared with actual values as per the purchase orders and the purchase order value is less than the cost mentioned in the DPR. The tariff is determined by previous year's electricity bill which is subject to minor variation. All other expenses are much less than 20% of the total cost. Hence, only PLF needs to be subjected to reasonable variation. Nevertheless, following factors have been subjected to sensitivity analysis:

- (a) PLF
- (b) O&M Cost

- (c) Project Cost
- (d) Tariff Rate

The sensitivity analysis reveals that even under more favourable conditions, the IRR without CDM revenue would not cross the benchmark return as given in the following table:

Sensitivity Analysis for 4.5 MW Wind project at Dhar Site, Madhya Pradesh

Sensitivity Analysis	Equity IRR			
Variation %	-10%	Normal	10%	Breaching Value
PLF	5.40%	6.75%	8.02%	75.41%
O&M	7.01%	6.75%	6.48%	-485.10%
Project Cost	7.86%	6.75%	5.81%	-47.72%
Tariff Rate	5.40%	6.75%	8.02%	75.41%

Final Result:

Equity IRR without CDM	Benchmark (Equity IRR)
6.75%	15.32%

Sensitivity Analysis for 7.5 MW Wind project at Ghatiya Site, Madhya Pradesh

Sensitivity Analysis	Equity IRR			
Variation %	-10%	Normal	10%	Breaching Value
PLF	5.68%	7.00%	8.25%	73.50%
O&M	7.25%	7.00%	6.74%	-472.14%
Project Cost	8.13%	7.00%	6.05%	-46.52%
Tariff Rate	5.68%	7.00%	8.25%	73.50%

Final Result:

Equity IRR without CDM	Benchmark (Equity IRR)
7.00%	15.32%

Sensitivity Analysis for 6 MW Wind project at Sadla Site, Gujarat

Sensitivity Analysis	Equity IRR			
Variation %	-10%	Normal	10%	Breaching Value
PLF	4.65%	5.90%	7.08%	92.18%
O&M	6.14%	5.90%	5.65%	-636.36%
Project Cost	6.95%	5.90%	5.02%	-51.97%
Tariff Rate	4.65%	5.90%	7.08%	92.18%

Final Result:

Equity IRR without CDM	Benchmark (Equity IRR)
5.90%	15.43%

Sensitivity Analysis for 6 MW Wind project at Sadla Site, Gujarat

Sensitivity Analysis	Equity IRR			
Variation %	-10%	Normal	10%	Breaching Value
PLF	4.76%	5.98%	7.15%	91.99%
O&M	6.22%	5.98%	5.74%	-635.00%
Project Cost	7.03%	5.98%	5.11%	-51.86%
Tariff Rate	4.76%	5.98%	7.15%	91.99%

Final Result:

Equity IRR without CDM	Benchmark (Equity IRR)
5.98%	15.43%

Sensitivity Analysis for 26 MW Wind project at Kinfara Site, Kerala

Sensitivity Analysis	Equity IRR			
Variation %	-10%	Normal	10%	Breaching Value
PLF	8.67%	10.66%	12.72%	22.10%
O&M	10.97%	10.66%	10.34%	-168.50%
Project Cost	12.63%	10.66%	9.14%	-20.07%
Tariff Rate	8.67%	10.66%	12.72%	22.10%

Final Result:

Equity IRR without CDM	Benchmark (Equity IRR)
10.66%	15.48%

Sensitivity Analysis assessment:

Probability to breach the benchmark:
Sensitivity Parameter 1 : PLF
PLF considered in financials for is as per Third Party PLF report in line with “Guidelines for the reporting and validation of Plant load factors” stated in EB48 Annex11 option 3(b). Hence, variation in PLF of more than 10% is unlikely to happen as the PLF has been reported as per the Third Party Report based on long term data.
Sensitivity Parameter 2 : O&M
The sensitivity analysis reveals that O&M will breach the benchmark at negative values and is hypothetical case. Since the O&M cost is subject to escalation (as evidence by the O&M agreement) and also subject to inflationary pressure, any reduction in the O&M costs is highly unlikely. Hence, the reduction in the O&M cost is highly unlikely.

Sensitivity Parameter 3 : Project Cost

Project Cost for financial analysis is considered from DPR of the project activity, being available at the time of investment making decision to go ahead with the project activity. The actual project cost is lower than the Offer letter. Since the Purchase Order cost is firm, there is no possibility of project cost going below this level. However, Sensitivity is carried out for threshold level below which benchmark is not breached.

Sensitivity Parameter 4 : Tariff Rate

The tariff is determined by PPA/ State electricity regulatory commission report which is fixed for entire lifetime of the project activity. Hence, there is no probability to get variation for the same. However, Sensitivity is carried out for +/-10% even then the benchmark is not breached.

Assessment team also confirmed the breaching values for individual parameters (=respective state project of same project owner) and thus confirms that the project is still additional

Site Name	Name of the Investor/Owner	Project Capacity (MW)	3 rd Party PLF	Tariff order PLF	Variation in PLF	Breaching Value for PLF
Dhar	D. J. Malpani	4.5	19.7%	19.7%	0.0%	75.41%
Ghatiya	D. J. Malpani	7.5	19.7%	19.7%	0.0%	73.50%
Sadla	D. J. Malpani	6	24.5%	24.5%	0.0%	92.18%
Savarkundala	D. J. Malpani	26	24.5%	24.5%	0.0%	91.99%
Kinfara	D. J. Malpani	22	22%	22%	0.0%	22.10%

Site Name	Name of the Investor/Owner	Project Capacity (MW)	Offer Letter Cost	Actual PO Cost	Variation in project cost	Breaching value for Project Cost
Dhar	D. J. Malpani	4.5	315	297	-5.71%	-47.72%
Ghatiya	D. J. Malpani	7.5	525	486	-7.43%	-46.52%
Sadla	D. J. Malpani	6	412.5	360.79	-12.54%	-51.97%
Savarkundala	D. J. Malpani	26	1787.5	1563.41	-12.54%	-51.86%
Kinfara	D. J. Malpani	22	1457.5	1364	-6.42%	-20.07%

Site Name	Name of the Investor/Owner	Project Capacity (MW)	SERC Tariff	PPA Tariff	Variation in Tariff	Breaching value in Tariff Rate
Dhar	D. J. Malpani	4.5	5.92	-	-	75.41%

Ghatiya	D. J. Malpani	7.5	5.92	5.92	0.00%	73.50%
Sadla	D. J. Malpani	6	4.19	4.19	0.00%	92.18%
Savarkundala	D. J. Malpani	26	4.19	4.19	0.00%	91.99%
Kinfara	D. J. Malpani	22	5.76	-	-	22.10%

Site Name	Name of the Investor/Owner	Project Capacity (MW)	Offer Letter O&M cost/MW	Actual O&M or SERC O&M cost/MW	Variation in O&M	Breaching value in O&M
Dhar	D. J. Malpani	4.5	1.07	0.5	-53.27%	-485.10%
Ghatiya	D. J. Malpani	7.5	1.07	0.5	-53.27%	-472.14%
Sadla	D. J. Malpani	6	1.1	0.88	-20.45%	-636.36%
Savarkundala	D. J. Malpani	26	1.1	0.88	-20.45%	-635.00%
Kinfara	D. J. Malpani	22	1.1	1.0	-9.09%	-168.50%

It can be observed from sensitivity table that in various scenarios wherein there are changes in tariff, O&M cost, electricity generation and project's capital cost, the equity IRR does not cross the benchmark. Thus, it can be concluded that revenue from sale of VERs is important to alleviate this gap and hence the project has been considered to be additional.

Moreover, Annex 3 of the EB 22 states that national and/or sectoral policies and circumstances have to be accounted for when considering the baseline scenario. Paragraph 7(a) states that, only those national and/or sectoral policies or regulations under paragraph 6(a), i.e., type E+ policy that increase GHG emissions, that have been implemented before adoption of the Kyoto Protocol by the COP (decision 1/CP.3, 11/12/1997), shall be taken into account when developing a baseline scenario. The Electricity Act of 2003 promoted cogeneration and generation of electricity from renewable sources of energy by providing suitable measures for connectivity with the grid and sale of electricity (Refer Section 86(1) of Electricity Act 2003). Therefore, it could be seen that the provincial and sectoral policies are E- i.e., policies that decrease GHG emissions and are after November 2001. Hence the baseline scenario of electricity generation by grid connected fossil fuel dominated power plants is in accordance with Annex 3 of EB 22.

The baseline mentioned in Section D.8.5 above is in compliance with all the applicable regulatory policies and laws. Additionally, the Project Participant is under no compulsion to opt for any particular technology or even a renewable mode of power generation. There is no governmental body or EB policy which requires a particular kind of fuel to be chosen and there is no legal requirement to which the above alternative does not conform.

The common practice analysis is carried out step by step as per "Methodological tool: Common Practice, version 03.1" para 5. Stepwise approach for common practice is as follows:

Thus common practise analysis is conducted below:

1. Applicable Geographical Area (Para 9): The Madhya Pradesh, Kerala, and Gujarat state as per the respective project activity has been considered as the applicable geographical area for this

project. PP had considered the state of Madhya Pradesh, Kerala, and Gujarat as per the project geo-graphical area due to regulatory regime since applicable power tariff structure for renewable energy projects is unique for all the states across national boundary of India; which is based on Electricity Act 2003 (EA 2003), section 82 which clearly mentions “*Every State Government shall, within six months from the appointed date, by notification, constitute for the purposes of this Act, a Commission for the State to be known as the (name of the State) Electricity Regulatory Commission*” Appropriateness of the same has been checked and confirmed from EA 2003 (<http://www.cercind.gov.in/08022007/Act-with-amendment.pdf>^{40/}).

Furthermore, following significant points on the State specific policy & regulatory framework on the renewable energy projects with special emphasis to wind power projects have been validated:

- Electricity Act 2003 (EA 2003) has changed the legal and regulatory framework for the renewable energy sector in India. The EA 2003 mandates policy formulation to promote renewable sources of energy by the federal government, the State governments and the State Electricity Regulatory Commissions (=SERCs) within their jurisdictions.
- The Electricity Act 2003 introduced some enabling provisions conducive to accelerated development of grid connected renewable energy sources. Under Section 61(h), promotion of cogeneration and generation of electricity from renewable sources of energy has been made the explicit responsibility of SERCs, which are bound by law to take these considerations into account while drafting their terms and conditions for tariff regulations. Nearly all SERCs have issued their tariff regulations incorporating suitable clauses, which will enable them to provide a preferential treatment to renewable energy (RE) during the tariff determination process. The SERCs determine the tariff for all renewable energy projects across the States, and the state-owned power Distribution Companies (DISCOMs) ensure grid connectivity to the renewable energy project sites.
- EA 2003 has initiated the adoption of the National Tariff Policy, 2006 as one of the key policies, National Tariff Policy (2006) framed under the Section 3 of the EA 2003. As per the excerpt from National Tariff Policy, 2006; pursuant to provisions of section 86(1)(e) of the EA 2003, the Appropriate Commission shall fix a minimum percentage for purchase of energy from such sources taking into account availability of such resources in the region and its impact on retail tariffs. Such percentage for purchase of energy should be made applicable for the tariffs to be determined by the SERCs latest by April 1, 2006.
- As mandated under section 86(1)(e) of the Electricity Act (2003), by June 2012, 26 SERCs had fixed quotas (in terms of % of electricity being handled by the power utility) to procure power from renewable energy sources. The mandate, which is called a Renewable Purchase Specification (RPS), varies from 0.5% to 14% in various states over varying time-scales. Few states have come out with technology specific RPSs. Besides, the state regulators determine the tariff for all RE projects in the states and ensure connectivity to the grid through extension of power evacuation from the RE project sites.
- At present thirteen SERCs have declared preferential feed-in tariffs (FITs) for purchase of electricity generated from wind power projects established in respective states, which varies from state to state in India. All the SERCs have adopted a 'cost plus' methodology to fix the feed-in

tariff, which varies across the states depending upon the state resources, project cost and more importantly the tariff regulations of SERCs. Wind power related tariff policies in different states also has difference in regulatory and policy incentives. Several states have implemented fiscal and financial incentives for renewable energy generation, including; energy buy back (i.e. a guarantee from an electricity company that they will buy the renewable power produced); preferential grid connection and transportation charges and electricity tax exemptions.

Therefore the investment climate for the renewable energy projects varies from State to State within India due to state specific local policy & regulatory framework as outlined by the State Electricity Regulatory Commissions of the respective state. This difference in investment condition leads to essential distinction among wind energy projects between different States of the host country India

Thus, the specific geographical area i.e. state of Madhya Pradesh, Kerala, and Gujarat as per the project for the common practice analysis of the proposed project activity is considered and thus the same is acceptable to the assessment team.

2. Measure (Para 10): The project activity reduces greenhouse gas emissions by generating electricity using renewable energy source-wind. Therefore, the project activity falls under the following measure:
 - (b) Switch of technology with or without change of energy source including energy efficiency improvement as well as use of renewable energies.
3. Output (Para 11): The project activity produces electricity. Therefore, electricity is considered as output of the project activity.
4. Different Technologies (Para 12): The project activity uses wind energy for producing electricity and hence as per Para 12(a), the technologies which use energy source/ fuel other than wind will be considered as the different technologies for the project activity.

The step wise approach to provide common practice analysis as per the guideline is as follows:

Step (1): calculate applicable capacity or output range as +/-50% of the total design capacity or output of the proposed project activity.

Range	Capacity	Unit
+50%	99	MW
Capacity of the proposed project activity	66	MW
-50%	33	MW

Since the project activity is 66MW, the output range of +/- 50% has been considered as 99 MW (Higher range for comparison) to 33 MW (Lower range for Comparison) which is assessed to be correct.

Step (2): identify similar projects (both CDM and non-CDM) which fulfil all of the following conditions:

a) Assessment team noted that as the projects are located in Madhya Pradesh, Kerala and Gujarat state of India, therefore, projects in the geographical area of Madhya Pradesh, Kerala and Gujarat state have been chosen for analysis. Each state have different policies regarding renewable energy, hence Rajasthan state is considered as geographical region for common practise analysis. The distinction from choosing the state to entire geographical boundary is already explained above in the report and thus the applied geographical area is acceptable to the assessment team.

b) Assessment team noted that the project activity is a green-field wind power project and uses measure (b) "Switch of technology with or without change of energy source including energy efficiency improvement as well as use of renewable energies". Therefore, projects applying same measure (b) are candidates for similar projects.

c) Assessment team confirms during the site visit that the energy source used by the project activity is Wind. Hence, only Wind energy projects have been considered for analysis.

d) Assessment team confirms during the site visit that the project activity produces electricity; therefore, all power plants that produce electricity are candidates for similar projects.

e) Since the project activity is 66MW, the output range of +/- 50% has been considered as 99 MW (Higher range for comparison) to 33 MW (Lower range for Comparison) which is assessed to be correct.

f) The start date of the project activity is 28/03/2016. Therefore projects, which have started commercial operation before 28/03/2016, have been considered for analysis.

Numbers of Similar projects (CDM and non-CDM) identified, which fulfil above-mentioned conditioned are:

Particulars	No. of Projects	Source
N_{Wind}	17	Directory - Indian Wind Power published by CECL, Bhopal -2016

Sources: Directory - Indian Wind Power published by CECL, Bhopal and refer CPA sheet

N_{wind}= 17 (Assessment team confirms the data presented in the joint PD and MR is correct by the cross check of the sources-both present in the PD and independent search)

Assessment team checked the Indian Wind Power Directory- 2016, 16th Edition was considered to determine the similar projects. The details are checked and found correct by the assessment team.

Step (3): Within the projects identified in Step 2, identify those that are neither registered CDM project activities, project activities submitted for registration, nor project activities undergoing validation. Note their number N_{all} .

CDM project activities, which have got registered or are under validation have been excluded in this step. As per the requirement of step 3, CDM project activities, which have got registered or are under validation have been excluded in this step. After excluding the registered and under validation projects the total number of projects is 2. The source of check for the same is cdm.unfccc.int

$N_{all} = 2$ (Assessment team confirms the data presented in the joint PD and MR is correct by the cross check of the sources-both present in the PD and independent search)

Step (4): Within similar projects identified in Step 3, identify those that apply technologies that are different to the technology applied in the proposed project activity. Note their number N_{diff} .

As per the tool on Common Practice, the project activities have been separated from the different technologies on the basis two criteria:

1. Size of Installation – Since project activity is large scale project, small and micro scale projects are considered as different technology project. Based on this criteria, there are no any different technology project out of similar identified projects.

2. Investment climate on the date of the investment decision – For proposed project activity, there are no any different technology project considered out of similar identified projects.

Hence, projects where either of the conditions is satisfied those projects are counted for calculating N_{diff} projects.

$N_{diff} = 0$ (Assessment team confirms the data presented in the joint PD and MR is correct by the cross check of the sources-both present in the PD and independent search)

Step (5): Calculate factor $F = 1 - N_{diff}/N_{all}$ representing the share of similar projects (penetration rate of the measure/technology) using a measure/technology similar to the measure/technology used in the proposed project activity that deliver the same output or capacity as the proposed project activity.

Calculate $F = 1 - N_{diff}/N_{all}$

$$F = 1 - (0/2) = 1$$

As per methodological tool “common practise” version 03.1, the proposed project activity is a “common practice” within a sector in the applicable geographical area if the factor F is greater than 0.2 and $N_{all} - N_{diff}$ is greater than 3.

Thus if both conditions are fulfilled, then project activity will be a common practise otherwise, the project activity is treated as not a common practise.

Outcome of Common Practise analysis:

As,

- i. $F = 1$; is greater than 0.2
- ii. $N_{all} - N_{diff} = 2$; is not greater than 3

Thus, the proposed project activity is not a “common practice” within a sector in the applicable geographical area.

Assessment team confirms from the above discussions show that wind power development is not a common practice and the project activity is not financially attractive; hence the project activity is additional.

No commercially sensitive information has been excluded from the public version of the project description.

Contribution to sustainable development:

Ministry of Environment and Forests, has stipulated economic, social, environment and technological well-being as the four indicators of sustainable development. The project contributes to sustainable development using the following ways.

- **Social well-being:** The project would help in generating employment opportunities during the construction and operation phases. The project activity will lead to development in infrastructure in the region like development of roads and also may promote business with improved power generation.
- **Economic well-being:** The project is a clean technology investment in the region, which would not have been taken place in the absence of the VCS benefits the project activity will also help to reduce the demand supply gap in the state. The project activity will generate power using zero emissions wind based power generation which helps to reduce GHG emissions and specific pollutants like SO_x, NO_x, and SPM associated with the conventional thermal power generation facilities.
- **Technological well-being:** The successful operation of project activity would lead to promotion of wind based power generation and would encourage other entrepreneurs to participate in similar projects
- **Environmental well-being:** Wind being a renewable source of energy, it reduces the dependence on fossil fuels and conserves natural resources which are on the verge of depletion. Due to its zero emission the project activity also helps in avoiding significant amount of GHG emissions.

During the site visit it was concluded that the project is implemented as per the instruction of the PD. During the current monitoring period it was observed that no unforeseen situation evolved which can

impact the operation of the project activity. Scheduled maintenance was carried out as per the instruction of the manufacturer and the same is acceptable to the assessment team.

CAR 01 was raised during the validation process regarding detail missing in section1 of the VCS PD as per the requirement of VCS PD template. Please refer Appendix 2 of this report for the detail closure of the CAR.

3.2 Participation under Other GHG Programs

During the site visit the Project Proponent confirmed that they have not applied under any other GHG programs to avail revenues from emission reductions achieved from this particular project activity.

For current monitoring period, there is no any claim of GHG emission reductions with other GHG program.

The present project activity is not participating in other Environmental credits, other GHG programs and has not been rejected by other GHG programs.

The project is not involved in any other form of GHG emission program and VERs generated from this verification will not be used for other trading program to avoid any kind of double counting. The same is confirmed by the individual project owners during the verification site visit. Assessment team also conducted independent review regarding the same and found that the statement/declaration of the Project owners is accurate and project is not involved in any other kind of GHG trading for the present verifications/monitoring period. Assessment team also checked other GHG program web site (cdm.unfccc.int, www.v-c-s.org, <https://www.goldstandard.org/>) and confirm that the Project has no intend to generate any other form of GHG-related environmental credit for GHG emission reductions or removals. The project activity are willing to get registered under VCS program. Assessment team also crosschecked that no Project owner is claiming REC; the same can be verified with the Renewable Energy Certificates accreditation body of India⁹. Further, if any Project owner is availing REC benefits in future, the Project owners will claim either VCU or REC and there will not be any double accounting for the same monitoring period. CAR 02 was raised during the validation process. Please refer Appendix 2 of this report for the detail closure of the CAR.

3.3 Application of Methodology

3.3.1 Title and Reference

The project activity as part of the proposed project activity will be large scale project activity with power generation capacity more than 15 MW. Accordingly the following methodologies is used for each of the project activity instance based on its capacity:

The methodology for large scale project activity will be the approved methodology for large-scale CDM project activities. The details of the methodology are as follows:

Methodology : ACM0002

⁹https://recregistryindia.nic.in/index.php/general/publics/accredited_regens_pdf

Project Type : Type-I: Renewable Energy Projects

Title : Grid-connected electricity generation from renewable sources --- Version 17.0, Sectoral Scope: 01,

<https://cdm.unfccc.int/methodologies/DB/8W400U6E7LFHHYH2C4JR1RJWWO4PVN>

Version No : Version 17

Reference : CDM Methodologies:

The project activity also takes reference from following Tools from the tools prescribed by applied methodology:

- **Tool for the demonstration and assessment of additionality** --- Version 07.0.0, EB 70, Annex 8
<https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v7.0.0.pdf>
- **Tool to calculate the emission factor for an electricity system** --- Version 06.0
<https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v5.0.pdf>

3.3.2 Applicability

The following steps will show the applicability of the project under this methodology.

The project status is corresponding to the methodology ACM 0002. Applicability of ACM 0002 is discussed below:

ACM 0002 version 17:

Applicability	DOE assessment
This methodology is applicable to grid-connected renewable power generation project activities that: • install a Greenfield power plant; • involve a capacity addition to (an) existing plant(s); • involve a retrofit of (an) existing operating plants/units; • involve a rehabilitation of (an) existing plant(s)/unit(s) or • involve a replacement of (an) existing plant(s)/unit(s).	Assessment team confirmed during the validation and verification site visit that the project activity is installation of a new grid connected renewable energy power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (Greenfield plant) and hence this criterion is applicable.
The project activity may include renewable energy power plant/unit of one of the following types: hydro power plant/unit with or without reservoir, wind power plant/unit, geothermal power plant/unit, wind power	The proposed project activity will be an installation of a new grid connected wind power plant and hence this condition is met. Assessment team checked the same during

plant/unit, wave power plant/unit or tidal power plant/unit;	the onsite visit and found correct.
In the case of capacity additions, retrofits, rehabilitations or replacements (except for wind, wind, wave or tidal power capacity addition projects the existing plant/unit started commercial operation prior to the start of a minimum historical reference period of five years, used for the calculation of baseline emissions and defined in the baseline emission section, and no capacity expansion, retrofit, or rehabilitation of the plant/unit has been undertaken between the start of this minimum historical reference period and the implementation of the project activity;	The proposed project activity do not involve any capacity additions, retrofits or replacements and therefore this condition is not applicable. Assessment team checked the same during the onsite visit and found correct.
In case of hydro power plants, one of the following conditions shall apply: • The project activity is implemented in existing single or multiple reservoirs, with no change in the volume of any of the reservoirs; or • The project activity is implemented in existing single or multiple reservoirs, where the volume of the reservoir(s) is increased and the power density calculated using equation (3), is greater than 4 W/m²; or • The project activity results in new single or multiple reservoirs and the power density, calculated using equation (3), is greater than 4 W/m².	The proposed project activity is a grid connected wind power project. This condition is applicable only for hydro power plants and not applicable for wind projects. Hence this criterion is not applicable. Assessment team checked the same during the onsite visit and found correct.
The project activity is an integrated hydro power project involving multiple reservoirs, where the power density for any of the reservoirs, calculated using equation (3), is lower than or equal to 4 W/m², all of the following conditions shall apply: • The power density calculated using the total installed capacity of the integrated project, as per equation (4), is greater than 4 W/m²; • Water flow between reservoirs is not used by any other hydropower unit which is not a part of the project activity; • Installed capacity of the power plant(s) with power density lower than or equal to 4 W/m² shall be; ✓ Lower than or equal to 15 MW; and ✓ Less than 10 per cent of the total installed capacity of integrated hydro power project.	The proposed project is a grid connected wind energy power project. This condition is applicable only for hydro power plants and not applicable for wind projects. Assessment team checked the same during the onsite visit and found correct.
In the case of integrated hydro power projects, project	The proposed project activity is a grid connected wind power project. This

proponent shall: • Demonstrate that water flow from upstream power plants/units spill directly to the downstream reservoir and that collectively constitute to the generation capacity of the integrated hydro power project; or • Provide an analysis of the water balance covering the water fed to power units, with all possible combinations of reservoirs and without the construction of reservoirs. The purpose of water balance is to demonstrate the requirement of specific combination of reservoirs constructed under CDM project activity for the optimization of power output. This demonstration has to be carried out in the specific scenario of water availability in different seasons to optimize the water flow at the inlet of power units. Therefore this water balance will take into account seasonal flows from river, tributaries (if any), and rainfall for minimum five years prior to implementation of CDM project activity.	condition is applicable only for hydro power plants and not applicable for wind projects. Assessment team checked the same during the onsite visit and found correct.
Methodology is not applicable to the following • Project activities that involve switching from fossil fuels to renewable energy sources at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site; • Biomass fired power plants/units	The project activity will be installation of a new grid connected wind power project and does not involve switching from fossil fuel to renewable energy and hence this criterion is not relevant to the project activity. This project activity does not involve any biomass based power plants and hence this criterion is not applicable to the project activity. Assessment team checked the same during the onsite visit and found correct.
In the case of retrofits, rehabilitations, replacements, or capacity additions, this methodology is only applicable if the most plausible baseline scenario, as a result of the identification of baseline scenario, is “the continuation of the current situation, that is to use the power generation equipment that was already in use prior to the implementation of the project activity and undertaking business as usual maintenance”.	The project activity will be a new grid connected wind power plant and not a retrofits, replacement or capacity additions and therefore this criterion is not applicable to the project activity. Assessment team checked the same during the onsite visit and found correct.
Applicability conditions of “Tool to calculate the emission factor for an electricity system”	
This tool may be applied to estimate the OM, BM and/or CM when calculating baseline emissions for a	This condition is applicable. OM, BM and CM are estimated using the tool for

project activity that substitutes grid electricity that is where a project activity supplies electricity to a grid or a project activity that results in savings of electricity that would have been provided by the grid (e.g. demand-side energy efficiency projects).	calculating baseline emissions. Assessment team checked the same during the onsite visit and found correct.
Under this tool, the emission factor for the project electricity system can be calculated either for grid power plants only or, as an option, can include off-grid power plants. In the latter case, the conditions specified in "Appendix 2: Procedures related to off-grid power generation" should be met. Namely, the total capacity of off-grid power plants (in MW) should be at least 10 per cent of the total capacity of grid power plants in the electricity system; or the total electricity generation by off-grid power plants (in MWh) should be at least 10 per cent of the total electricity generation by grid power plants in the electricity system; and that factors which negatively affect the reliability and stability of the grid are primarily due to constraints in generation and not to other aspects such as transmission capacity.	Since project activity is grid connected, this condition is applicable and the emission factor has been calculated accordingly. Assessment team checked the same during the onsite visit and found correct.
In case of CDM projects the tool is not applicable if the project electricity system is located partially or totally in an Annex I country.	The project activity will be located in India, a non-Annex I country. Therefore, this criterion is not applicable for the project activity. Assessment team checked the same during the onsite visit and found correct.
Under this tool, the value applied to the CO ₂ emission factor of biofuels is zero.	The project activity will be grid connected renewable energy project and CO ₂ emission factor is not considered for biofuels. Assessment team checked the same during the onsite visit and found correct.

3.3.3 Project Boundary

Means of validation	The project boundary as depicted in the PD version 01 is checked during the validation site visit and also during the interview with the plant official.
Findings	No Findings raised
Conclusion	The spatial extent of project boundary diagram (including the metering system) referred by the methodology is now mentioned in the PDD as per the requirement of applied methodology (for ACM 0002 version 17) and thus the same is acceptable to the assessment team. The below table mentions the emission source:

	Sources	GHGs involved	Description
Baseline Emissions	INDIAN Grid	CO ₂	Carbon Dioxide
Project Emissions	NA	NA	NA

3.3.4 Baseline Scenario

Client: Baseline Scenario									
Means of validation	The baseline scenario as depicted in the PD version 01 is checked during the validation site visit and also during the interview with the plant official.								
Findings	No findings were raised.								
Conclusion	Assessment team checked as per the applicable methodology, a Greenfield power plant is defined as “a new renewable energy power plant that is constructed and operated at a site where no renewable energy power plant was operated prior to the implementation of the project activity”. As the project activity falls under the definition of a Greenfield power plant, the baseline scenario as per applied methodology (ACM0002) is the following: As per para 23 of ACM0002 version 17.0; If the project activity is the installation of a Greenfield power plant <i>“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”.</i> Hence, the baseline for the project activity is the equivalent amount of power to the INDIAN grid. The combined margin ($EF_{grid,y}$) is the result of a weighted average of two emission factor pertaining to the electricity system: the operating margin (OM) (having weightage 25%) and build margin (BM) (having weightage 75%). Calculations for this combined margin must be based on data from an official source of CEA database (where available) version 12 and made publically available. The combined margin of the INDIAN National Grid used for the project activity is as follows: <table><tr><th>Parameter</th><th>Value</th><th>Nomenclature</th><th>Source</th></tr><tr><td></td><td></td><td></td><td></td></tr></table>	Parameter	Value	Nomenclature	Source				
Parameter	Value	Nomenclature	Source						

	EF _{grid,CM,y}	0.9653 tCO ₂ /MWh	Combined margin CO ₂ emission factor for the project electricity system in year y	Calculated as the weighted average of the operating margin (0.75) & build margin (0.25) values, sourced from Baseline CO ₂ Emission Database, Version 12.0 published by Central Electricity Authority (CEA), Government of India.
	EF _{grid,OM,y}	0.9843 tCO ₂ /MWh	Operating margin CO ₂ emission factor for the project electricity system in year y	Calculated as per "Tool to calculate the emission factor for an electricity system, version 06.0.0" as 3-year generation weighted average using data for the years 2013-14, 2014-15, 2015-16. The data are obtained from "CO ₂ Baseline Database for Indian Power Sector" version 12.0, published by the Central Electricity Authority, Ministry of Power, and Government of India.
	EF _{grid,BM,y}	0.9083 tCO ₂ /MWh	Build margin CO ₂ emission factor for the project electricity system in year y	Calculated as per "Tool to calculate the emission factor for an electricity system, version 06.0.0" BM is calculated ex-ante based on the most recent information available at the time of submission of PDD and is fixed for the entire crediting period. The data is obtained from "CO ₂ Baseline Database for Indian Power Sector" version 12.0, published by the Central Electricity Authority, Ministry of Power, and Government of India.
Validation Team, therefore, concludes that the PDD conforms to the guidance given by EB via VVS version 01 for the project activity.				

3.3.5 Additionality

Means of validation	The Offer letter, PPA, Commissioning Certificates are checked to confirm the capacity and additionality of the project
Findings	CAR 03 was raised during the validation process. Please refer Appendix 2 of the report for the closure of the CAR.
Conclusion	Additionality Assessment for large scale project In line with VCS Standard version 3.7, the additionality of the Project activity is ascertained in line with the applicable guidance from the UNFCCC. The demonstration of additionality for the proposed Project activity is being carried out in accordance with the additionality tool provided by the UNFCCC i.e. "Tool

	for demonstration and assessment of Additionality" Version 07.0.0,. The tool provides a step-wise approach to demonstrate additionality which is displayed below: Step 0: Demonstration whether the proposed project activity is the first-of-its-kind The proposed project activity is not the first-of-its-kind. Hence not applicable. Step 1: Identification of alternatives to the project activity consistent with current laws and regulations Sub-step 1a: Define alternatives to the project activity: Identify realistic and credible alternative(s) available to the project participants or similar project developers that provide outputs or services comparable with the proposed VCS project activity. The purpose of the project activity is to generate electrical power using wind energy and feed the electricity generated to the grid. Hence, the following alternatives are considered: Alternative 1: The proposed project activity not undertaken as a VCS project activity. The PP could proceed with the implementation of the project without Carbon credit benefits. The electricity produced from the renewable energy project would have been sold to the grid. This is in compliance with all applicable legal and regulatory requirements and can be a part of the baseline. However, the Project activity is not feasible without revenues from sale of Carbon Credits. This argument has been discussed in step 2 of the Additionality section. Alternative 2: No proposed project activity and equivalent amount of energy would have been produced by the grid electricity system through its currently running power plants and by new capacity addition to the grid i.e. Continuation of the present situation. The PP would have continued without investment in Project activity with usual business activities. The grid would continue with the fossil fuel based power projects and this would result in GHG emissions. Hence, the new capacity add-on from a fossil fuel based power plant is appropriate, realistic & credible baseline alternative for the project activity. Outcome of Sub-step 1a: All the realistic alternatives for the project activity have been enlisted above. Sub-step 1b: Consistency with mandatory laws and regulations:
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	The alternative(s) shall be in compliance with all applicable legal and regulatory requirements, even if these laws and regulations have objectives other than GHG reductions, e.g. to mitigate local air pollution. (This sub-step does not consider national and local policies that do not have legally-binding status.). The relevant national laws and regulations pertaining to generation of energy in India are: • Electricity Act 2003 • National Electricity Policy 2005 • Tariff Policy 2006 The Project activity conforms to all the applicable laws and regulations in India: • Power generation using wind energy is not a legal requirement or a mandatory option. • There are state and sectoral policies, framed primarily to encourage wind power projects. These policies have also been drafted realizing the extent of risks involved in the projects and to attract private investments. • The Indian Electricity Act, 2003 (May 2007 Amendment) does not influence the choice of fuel used for power generation. • There is no legal requirement on the choice of a particular technology for power generation. Outcome of Sub-step 1b: Hence, both the alternatives enlisted above are found to comply with the mandatory laws and regulations taking into account the enforcement of the legislations in the region or country and EB decisions on national and/or sectoral policies and regulations. However, Alternative 2 has been selected as the appropriate baseline alternative for this project activity. Step 2: Investment analysis The detail analysis is presented above in the report.
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3.3.6 Quantification of GHG Emission Reductions and Removals

Means of validation	The emission reduction sheet, CEA database and Joint PD and MR version 02 is checked by the assessment team.
Findings	CAR 04 was raised during the validation process. Please refer Appendix 2 for the closure of the report.
Conclusion	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 17. <u>Baseline Emission (BE_y):</u> $BE_y = EG_{PJ,y} \times EF_{grid\ CM,y} \text{-----}(1)$

Where

BE_y = Baseline Emissions in year y; (tCO₂)

$EG_{pj,y}$ = Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year y (MWh)-

$EF_{grid, CM, y}$ = Grid emission factor (MWh/tCO₂)

PROJECT OWNERS has estimated the baseline energy generation considering the capacity of the project activity, yearly generation hour and plant load factor. 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.

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 12.0 which is sourced from CEA, 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.

For estimating the operating margin emission factor, PROJECT OWNERS calculated ex-ante Simple Operating Margin (OM). As per the "Tool to calculate the emission factor for an electricity system": for grid power plants, use a 3-year generation-weighted average, based on the most recent data available at the time of submission of the CDM-PDD to the DOE for validation. Hence, PROJECT OWNERS considered the weighted average of latest net electricity generation and import of electricity and associated emission from CEA version 12. The value of operating margin considered as 0.9843tCO₂/MWh and the value of build margin as 0.9083tCO₂/MWh (based on the latest one year data). The weighting for both operating margin is taken as 0.75 and build margin as 0.25 for wind power generation projects. Validation team checked the estimation procedure and considered data and found transparent and conservative. Emission factor of the project considered is mentioned below:

$EF_{grid, y} = 0.9653\text{tCO}_2\text{e/MWh}$ and it is fixed ex ante for the crediting period.

Considering this process, combined margin emission factor has been considered and same value is confirmed correct.

Project Emissions:

As Wind technology is a renewable energy source and as per the ACM 0002 version 17 there are no project related emissions associated with it, therefore, $PE_y = 0$.

Leakage Emissions:

As per ACM 0002 version 17, there is no leakage emission.

Emission Reductions:

	The project activity reduces carbon dioxide emissions through displacement of grid electricity generation with predominantly fossil fuel based power plants¹⁰ 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: $ER_y = BE_y - PE_y$: As per ACM 0002 Where, BE_y = Baseline emissions in the year y in tCO_{2e} PE_y = Project emissions in the year y. LE_y = Emissions due to leakage in the year y. As per ACM 0002 $PE_y = 0$ for the project activity as per the methodology Therefore, $ER_y = BE_y$ for the project activity.
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3.3.7 Methodology Deviations

The project activity used ACM 0002 version 17 which is as latest as per UNFCCC website and thus no deviation is sought regarding the methodology. The project complies with all the requirement of the methodology and thus deviation to the methodology is not a requirement for the present project activity.

3.3.8 Monitoring Plan

Means of validation	Assessment team checked the monitoring practice onsite and also checked the guideline of respective State electricity regulatory commission.
Findings	CAR 05 was raised during the validation process. Please refer Appendix 2 of this report for the closure of the CAR.
Conclusion	<u>Parameters determined ex-ante:</u> Baseline emission factor of INDIAN Grid is establish ex-ante based on Tool to calculate the grid emission factor version 06, using a combined approach consisting 75 % operating margin and 25 % build margin. The emission coefficient from official data published in Central Electricity Authority (CEA) CO₂ Baseline database version 12 available to the project participant at the time of submission of Joint VCS PD and MR for validation and global stakeholder's consultation process. CEA is an official source of Ministry of Power, Government of India have worked out baseline as CO₂ baseline database. The assumption were verified by the validation team and found to be correct. <u>Parameters determined ex-post:</u> The parameters monitored ex-post involves net electricity supplied to the grid (calculated from electricity exported and imported) to the INDIAN grid by the

¹⁰ http://www.cea.nic.in/power_sec_reports/general_review/0304/tables.pdf

	project activity. As per the Joint MR and PD version 02, JMR reports from respective state electricity board/DISCOM will be the source of data during verification for each of the respective states. The DOE will use the same source for verification of emission reductions As per the ACM 0002 version 17 "Monitoring shall consist of metering the net electricity supplied by the project activity to the grid. Measurement results shall be cross-checked with records of the Invoices". In accordance with the methodology requirement, net electricity supplied by the project activity is obtained from JMR sheets from respective state electricity board/DISCOM which provide input values ($EG_{\text{export},y}$ $EG_{\text{import},y}$), used for calculation of $EG_{\text{pj},y}$ by the project activity and form the basis for emission reduction calculation. Electricity export to the grid and import from the grid is metered by main and check tri-vector energy meters. The main meter reading is taken jointly on a fixed day of every month for the preceding month at the delivery point and signed by the representatives of state utility and O&M personnel. In the event of failure of main meter, the check meter will be used in monitoring the electricity data. The agency is experienced in the monitoring system and is managing O&M of numerous other wind farm projects. The validation team therefore is of the opinion that the project participant through the O&M agency is capable of implementing the monitoring plan in the context of the project activity. Calibration of all the meters is done by state electricity board officials as per the industry standards. However, the calibration will be done once in a 5 year¹¹ for all the project activity. The meters will be of accuracy class 0.2 for the respective states. The meter accuracy class and calibration interval is under purview of state electricity board and PP do not have any control on it. It is also noted that apportioning procedure is under control of state electricity board and PP do not have any control on it. The Calibration agency follows the national guideline for calibration and the traceability is also established regarding the same. The national guideline is under the purview of National Accreditation Board for Testing and Calibration Laboratories (http://www.nabl-india.org/) and all the Calibration agency follows the same. Assessment team found that for the present project activity the calibration is done by an accredited calibration agency by National Accreditation Board for Testing and Calibration Laboratories and thus the Calibration certificate is found correct. The available parameter to PP is the net electricity supplied to grid and same parameter is mentioned as monitoring parameter. The Net electricity exported to the grid will be cross checked against the invoice raised by the PP towards the DISCOM. The energy meter recording the export and import from the grid at substation is under the control and supervision of state electricity board officials. Similarly O&M contractor is responsible for monitoring of the generation data at CMS. It is reported that the data will be kept for 2 years following the end of the crediting period.
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¹¹ http://powermin.nic.in/whats_new/pdf/Metering_Regulations.pdf, page 12

The responsibilities and authorities of project management, data handling and recording, measurement methods and QA/QC procedure have been systematically established and formalized and the same was verified during the site visit.

3.4 Non-Permanence Risk Analysis

Not applicable for the present project activity.

4 SAFEGUARDS

4.1 No Net Harm

The bundled project activity promotes environmental and socio-economic well-being as it results in zero GHG emissions due to installation and operation of clean, renewable energy technology for electricity generation. CAR 06 was raised during the validation process. Please refer Appendix 2 in the report for the closure of the CAR.

As project is a renewable energy project hence there is no negative environmental and socio impact effect and the same can be summarized in the below table:

S.No.	Indicator	Assessment team opinion
1	Air quality	The project generates clean energy which replaces the fossil fuel intensive electricity generation. Also report on “Developmental Impacts and Sustainable Governance Aspects of Renewable Energy Projects” prepared by MNRE dated September 2013. This report clearly mentioned that wind farms operations do not result in direct air pollution. Adequate measures were taken to mitigate the envisaged impacts like spraying water on the road side to reduce dust level, etc. This was confirmed by the local stakeholders. Therefore, it is validated that mitigation measures were robustly implemented on ground for air quality issues project will have a positive impact on air quality.
2	Water quality and quantity	The project has no effect on water quality and quantity because it neither generates any waste nor consume any water. It was validated during on-site assessment

		that there was no requirement of water for operations of Wind turbine and the only usage of water was for drinking and sanitation purpose. The consumption of fresh water during construction was also pretty much limited as confirmed by the local stakeholders. Hence the parameter is indicated as neutral and the same is acceptable to the DOE
3	Soil condition	There are negligible impacts envisaged during operation of the project activity. For mitigating the impacts during construction, various mitigation measures were taken which is validated from the plant records of PP and the interview with local villagers. The top soil excavated during construction, was stockpiled and used for compaction. The roads were not paved and soling was done with excavated earth & rock material, so land disturbance could be minimized. It was also confirmed that, the vegetation done at site helps for soil erosion. The same is confirmed during the stakeholder meetings during onsite visit. Therefore, it can be concluded that the project has no effect on soil conditions during its operation because it has no waste coming out.
4	Biodiversity	During the validation site visit it was observed that the condition of ground vegetation will be gradually improved; No rare species has been found in the around area. The project site is not on the

		migration route of migratory bird. As Such Wind turbine do not have any obstruction in the path of migratory birds. With the implementation of Project, the greening water will be increased significantly; the biodiversity in the vicinity will be improved with the vegetation improvement. NO negative impact envisaged.
5	Employment Generation	The project activity employed local population as skilled workers as well as security guards which were envisaged during the validation site visit. The personnel employed by the project activity are also provided trainings and exposed to various awareness programs therefore a positive indicator has been accepted.
6	Livelihood of the poor	The project is associated with infrastructure development like roads in the nearby areas and promoting economic activities like grants to local school and communities temples etc. Also, project employed local villagers as guards for the security of Wind turbines. Positive impact envisaged. .

4.2 Environmental Impact

Means of validation	The guideline provided by Ministry of Environment and Forest (=MOEF) is checked by the assessment team http://envfor.nic.in/legis/eia/so1533.pdf
Findings	No findings raised
Conclusion	The project activity is expected to have positive impacts and no significant adverse environmental impacts are foreseen. Since, the project activity is an electricity generation from renewable source (i.e. wind energy) therefore no negative impact are envisaged. There is no mandatory legal requirement for carrying out an environmental impact assessment in the host country. The

	Ministry of Environment and Forests (MoEF), Government of India (GoI) notification ¹² dated September 14, 2006 regarding the requirement of Environment Impact Assessment (EIA) studies states that any project developer in India needs to file an application to the Ministry of Environment and Forests (including a public hearing and an EIA) in case the proposed industry or project is listed in a predefined list. The list includes thirty nine project activities that require EIA studies. The wind power projects are not included in this list and thus an EIA study is not required.
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4.3 Local Stakeholder Consultation

.Means of validation	The local stakeholder consultation Minutes of Meeting (=MOM), attendance sheet is checked by the assessment team. During the validation site visit assessment team also interviewed some of the stakeholder present during the meeting with PP.																												
Findings	CAR 07 was raised during the validation process. Please refer below Appendix 2 for the closure of the CAR																												
Conclusion	As per the VCS requirements, it is necessary to invite the relevant stakeholders, prior of the validation process. The detail of the invitation date and stakeholder meeting date is as below: <table><tr><th>Sl. No</th><th>Project Investor</th><th>Project Site</th><th>State</th><th>Notice Date</th><th>Meeting Date</th></tr><tr><td>1</td><td rowspan="5">D. J. Malpani</td><td>Dhar</td><td rowspan="2">Madhya Pradesh</td><td>08/02/2016</td><td>15/02/2016</td></tr><tr><td>2</td><td>Ghatiya</td><td>08/02/2016</td><td>16/02/2016</td></tr><tr><td>3</td><td>Sadla</td><td rowspan="2">Gujarat</td><td rowspan="2">04/10/2016</td><td rowspan="2">12/10/2016</td></tr><tr><td>4</td><td>Savarkundla</td></tr><tr><td>5</td><td>Kinfara</td><td>Kerala</td><td>12/01/2017</td><td>20/01/2017</td></tr></table> All the stakeholders have been invited through public notice to attend the stakeholders meeting. The local stakeholders’ consultation meeting was attended by local persons including local villagers, local vendors and technology suppliers. The stakeholders identified by the project participant were local villagers who are the major population of the particular area, local communities and gram panchayat (Village head), WTG supplier, project proponent representatives, O&M Team and other people involved in the project. Validation team verified the list of participants who attended the stakeholder meeting and feedback	Sl. No	Project Investor	Project Site	State	Notice Date	Meeting Date	1	D. J. Malpani	Dhar	Madhya Pradesh	08/02/2016	15/02/2016	2	Ghatiya	08/02/2016	16/02/2016	3	Sadla	Gujarat	04/10/2016	12/10/2016	4	Savarkundla	5	Kinfara	Kerala	12/01/2017	20/01/2017
Sl. No	Project Investor	Project Site	State	Notice Date	Meeting Date																								
1	D. J. Malpani	Dhar	Madhya Pradesh	08/02/2016	15/02/2016																								
2		Ghatiya		08/02/2016	16/02/2016																								
3		Sadla	Gujarat	04/10/2016	12/10/2016																								
4		Savarkundla																											
5		Kinfara	Kerala	12/01/2017	20/01/2017																								

¹² <http://envfor.nic.in/legis/eia/so1533.pdf>

	questionnaire and confirms the stakeholders identified are relevant. The validation team also verified the minutes of meeting to note that no negative comments were received and the same was cross checked with the information obtained during follow up interviews with the stakeholder's. Thus Validation team is of the opinion that the stakeholder meeting was adequate and appropriate. Assessment team also noted during the validation site visit that PP has already put a grievance register onsite in where stakeholders can write there complain if any. The complaint if found genuine will be immediately resolve by PP with the best reasonable level of knowledge and satisfaction of the stakeholders. The process is found genuine and thus PP ensured that ongoing process of Stakeholders benefits and complain can be taken care after and during operation of the power plant.
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4.4 Public Comments

Assessment team checked the project was listed on VCS web site on 17/04/2017 (http://www.vcsprojectdatabase.org/#/pipeline_details/PL1679). Public comment period was not applicable to this project. Hence, assessment team confirms that the same is correct and appropriate.

5 VERIFICATION FINDINGS

5.1 Accuracy of GHG Emission Reduction and Removal Calculations

Means of verification	The verification team assessed whether the data and calculations of GHG emission reductions achieved resulting from the Joint VCS PD+ MR. The verification team has checked whether calculations of baseline GHG emissions, project GHG emissions and leakage GHG emissions have been carried out in accordance with the formulae and methods described in the monitoring plan of the CDM PDD
Findings	CAR 10 was raised during the verification process. Please refer Appendix 2 of this report for the detail closure of the CAR.
Conclusion	The baseline Emissions for a given year is calculated by multiplying the energy baseline (EB) with the regional grid emission factor. The grid in this case would be the 'INDIAN Grid' Formula Used (As per the PD):- $BE_y = EG_{pj,y} * EF_{grid,CM,y}$ Where BE_y = Baseline emission for year 'y' $EG_{pj,y}$ = Energy Baseline; and $EF_{grid,CM,y}$ = Emission factor for INDIAN Grid The verification team has checked the entire monthly JMR from respective state electricity board/DISCOM (primary source) and invoices (cross check) applicable for the monitoring period as per the project activity applied for verifications and found all the parameters are monitored and recorded as per the monitoring plan in the PD. The verification team has crosschecked the emission reduction sheet and monitoring report data with the JMR from respective state electricity board/DISCOM and invoice bills and found all the values are matching.

5.2 Quality of Evidence to Determine GHG Emission Reductions and Removals

Means of verification	The verification team checked the break down log for the monitoring period. During the verification site visit the feeder wise location of the WTGs is also checked. The Calibration details are also checked.
Findings	CAR 09 raised during the verification process which was closed successfully. Please refer Appendix 2 of this report for the detail closure of the CAR.
Conclusion	The metering arrangement is tri-vector bi-directional energy meters (main and check) at the State Electricity Board (SEB) substation. These meters record several parameters including electricity exported & imported. Moreover, the meters are located at the HT side of the transformer and are of accuracy class of 0.2S for each project activity applied for verification. These electricity meters are being used by state electricity board for JMR (Joint Meter Reading) electricity generation statements. The Net electricity supplied to the grid is then calculated from export and import values. The net electricity exported to the grid is also cross checked from the invoices raised to respective state electricity board which is in line with Methodology requirement for large scale project. Hence assessment team confirmed that the value of net electricity exported to the grid as used in emission reduction calculation is correct. Electricity export to the grid and import from the grid is metered by main and check tri-vector energy meters. The main meter reading is taken jointly on a fixed day of every month for the preceding month at the delivery point and signed by the representatives of state utility and O&M personnel. In the event of failure of main meter, the check meter will be used in monitoring the electricity data. The agency is experienced in the monitoring system and is managing O&M of numerous other wind farm projects. The validation team therefore is of the opinion that the project participant through the O&M agency is capable of implementing the monitoring plan in the context of the project activity. Calibration of all the meters is done by state electricity board officials as per the industry standards. However, the calibration is done once in a 5year¹³. The energy meter recording the export and import from the grid at substation is under the control and supervision of state electricity board officials. Similarly O&M contractor is responsible for monitoring of the generation data at CMS. The Calibration agency follows the national guideline for calibration and the traceability is also established regarding the same. The national guideline is under the purview of National Accreditation Board for Testing and Calibration Laboratories (http://www.nabl-india.org/) and all the Calibration agency follows the same. Assessment team found that for the present project activity the calibration is done by an accredited calibration agency by National Accreditation Board for Testing and Calibration Laboratories and thus the Calibration certificate is found correct. It is reported that the data will be kept for 2 years following the end of the crediting period.

¹³ http://powermin.nic.in/whats_new/pdf/Metering_Regulations.pdf, page 12

	The responsibilities and authorities of project management, data handling and recording, measurement methods and QA/QC procedure have been systematically established and formalized and the same was verified during the site visit. On-site visit and interview with O&M personnel also confirms that the operational and organizational chart as mentioned in Joint PD+MR is as per the site practice and thus assessment team confirms that the details are correct. The break down log is checked and found that the Wind turbine undergone scheduled maintenance and break down. No unforced error observed and feeder wise Wind turbine location is also checked and found correct.
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6 VALIDATION AND VERIFICATION CONCLUSION

LGAI Technological Center, S.A. (Applus+ Certification) has been engaged by M/s D J Malpani to perform the Joint validation and verification of the “Bundled Wind Power Project in Madhya Pradesh, Gujarat and Kerala by D.J. Malpani”.

The management of the project participant is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions on the basis set out within the project's Monitoring Plan in the Joint PD and MR and the approved methodology ACM 0002 version 17.

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

- The projects description compliance with, the requirements of Article 12 of the Kyoto Protocol, the CDM Modalities and Procedures as agreed in the Marrakech Accords under decision 3/CMP.1, the annexes to this decision, subsequent decisions and guidance made by COP/MOP & CDM Executive Board and other relevant rules, including the Host Country legislation and sustainability criteria along with VCS guideline and standard version 3.7.
- The project's baseline and additionality is assessed against ACM 0002 version 17 for the project.
- The project's monitoring plan is assessed against ACM 0002 version 17 for the project activity.
- A risk based approach has been followed to perform this validation activity. The review of the project description and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews with Project Owner have provided *LGAI Technological Center, S.A. (Applus+ Certification)* with sufficient evidence for positive validation opinion as per the requirement of VCS.

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

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

Verification period: 28/03/2016 to 23/12/2017 (both days included).

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

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
2016	14,343	0	0	14,343
2017	62,037	0	0	62,037
Total	76,380	0	0	76,380

The calculation of Actual vs Estimated VERs is as below:

Annual Estimated ER calculation (365 days)	127,207
Estimated ER for current monitoring period	221,654
Actual ER calculation	76,380
Difference between estimated and actual	-65.54%

ER

Hence, actual VERs is -65.54% less than the estimated value. This is due to low PLF factor for the respective project sites of current monitoring period.

APPENDIX 1: DOCUMENTS REVIEWED DURING VALIDATION AND VERIFICATION

No.	Author	Title	References to the document	Provider
1	NA	Commissioning certificates of the wind turbine implemented in the project site.	Commissioning certificates of the respective states.	PROJECT OWNERS
2	NA	Contract of the other entity with the DOE	Contract of the other entity with the DOE	PROJECT OWNERS
3	NA	Technical specifications of Wind Panels generators from manufacturers	Manufacturer technical specifications	PROJECT OWNERS
5	NA	Emission Calculation sheet- Estimated- Version 01 Emission Calculation sheet- Actual-	23/01/2018 23/01/2018	PROJECT OWNERS

		Version 01 Emission reduction Sheet- Actual Version 02	19/02/2018	
6	NA	The operational lifetime of the project activity from the manufacturer =(Technical specefication s)	Manufacturer technical specifications	PROJECT OWNERS
7	NA	SERC ordres: http://mperc.gov.in/ http://www.georc.org/ www.erckerala.org RBI: Reserve Bank of India www.rbi.org.in Ministry of Environment and forest: www.envfor.nic.in UNFCCC www.cdm.unfccc.org	Reference link is provided.	Independent Search

		ccc.int CEA: Central electricity authority www.cea.nic.in Income tax act 1961 http://law.incometaxindia.gov.in/DIT/ VCS: Verified Carbon Standard www.v-c-s.org		
08	NA	Tools/ guidelines used in the project activity Tool to determine the remaining lifetime of the project activity in line with Annex	UNFCCC CDM web site	UNFCCC

		x 15 EB 50 • Tool to calculate the emission factor for an electricity system version 06 • Glossary of CDM terms version 07 • VCS verification report template version 03		
09	NA	JMR records for the complete monitoring period	JMR records	PROJECT OWNERS

10	NA	Joint PD+MR version 01	15/01/2018	PROJECT OWNERS
		Joint PD+MR version 02	23/01/2018	
		Joint PD+MR Version 03	19/02/2018	
11	NA	Invoices for the complete monitoring period	Invoice	PROJECT OWNERS
12	NA	Break down details of the complete monitoring period	Log sheet	PROJECT OWNERS
13	NA	Calibration details of the project undergoing verifications	Please referee Appendix 5 of this report	PROJECT OWNERS
14	NA	Financial Analysis and common practice Analysis sheet.	23/01/2018	PROJECT OWNERS

15	NA	PLF reports for Individual project owners		Site Name	Project Capacity (MW)	PLF (%)= 3rd party engineering company	Date	PROJECT OWNERS
				Dhar	4.5 MW	19.7%	12/12/2015	
				Ghatiya	7.5 MW	19.7%	12/12/2015	
				Sadla	6 MW	24.5%	10/09/2016	
				Savarkundala	26 MW	24.5%	10/09/2016	
				Kinfara	22 MW	22%	18/11/2016	
16	NA	Purchase orders		Site Name	Project Capacity (MW)	Project Cost (In Million)	PO Date	PROJECT OWNERS
				Dhar	4.5 MW	297	25/02/2016	
				Ghatiya	7.5 MW	486	25/02/2016	
				Sadla	6 MW	360.79	28/10/2016	
				Savarkundala	26 MW	1563.41	28/10/2016	
				Kinfara	22 MW	1364	23/02/2017	
17	NA	Offer letters		Site Name	Project Capacity (MW)	Offer Letter Date	PROJECT OWNERS	
				Dhar	4.5 MW	20/10/2015		
				Ghatiya	7.5 MW	20/10/2015		
				Sadla	6 MW	01/09/2016		
				Savarkundala	26 MW	01/09/2016		

			Kinfara	22 MW	25/11/2016		
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APPENDIX 2: CLARIFICATION REQUESTS, CORRECTIVE ACTION REQUESTS, FORWARD ACTION REQUEST (CAR/CL/FAR)

FOR VALIDATION:

CAR ID	01	Section no.	1	Date: 19/01/2018
Description of CAR				
During the document review it was observed that following details are missing in VCS PD				
1. A summary description of the technologies/measures (e.g., plant, equipment, process, or management or conservation measure) included in the project and the status of their implementation. 2. The relevant implementation dates (e.g., dates of construction, commissioning, and continued operation periods). 3. The total GHG emission reductions or removals generated in this monitoring period. 4. The Capacity of the project as mentioned in the listed VCS PD is not correct.				
Corrective action is sought for the same.				
Project participant response				Date: 23/01/2018
1. The technologies/measures and included in VCS PD. The commissioning dates and status are included in VCS PD. 2. The implementation status i.e. commissioning dates are mentioned in VCS PD. 3. The total GHG emission reductions generated during current monitoring period is mentioned in VCS PD. 4. The total capacity of project activity is 66 MW and same is mentioned in revised VCS PD.				
Documentation provided by project participant				
Revised VCS PD				
DOE assessment				Date: 16/02/2018

Following are the observations of the DOE:

1. The technologies/measures and now included in VCS PD. The commissioning dates and status are included in VCS PD.
2. The implementation status i.e commissioning dates are mentioned in VCS PD.
3. The total GHG emission reductions generated during current monitoring period is mentioned in VCS PD.
4. The total capacity of project activity is 66 MW and same is mentioned in revised VCS PD.

CAR is thus closed.

CAR ID	02	Section no.	3	Date: 19/01/2018
Description of CAR				
As per 1.12.3- 1.12.4 it was observed that the some project proponent is applied for REC benefits. Please provide appropriate link for the same and also proper documents to confirm that the PP will not claim other form of environmental credit for the monitoring period concerned. Moreover, PP should also produce documentary evidence that it has not participated in any other form of GHG emission for the current monitoring period. Corrective action is sought for the same and documents are required to be submitted for further analysis.				
Project participant response				Date: 23/01/2018
The PP is not availing any REC benefits for the project activity. The project activity WTGs are not registered under REC mechanism and same can be seen from web link of REC generators. https://www.recregistryindia.nic.in/index.php/general/publics/registered_regens The PP undertaking for no any REC benefits and no any double accounting for current monitoring period is provided to DOE.				
Documentation provided by project participant				
PP undertaking for no REC benefits, no double accounting				
DOE assessment				Date: 16/02/2018
The undertaking for double counting is checked and found correct by the assessment team. Project is not availing ant REC benefits and the same is checked from the REC registry by the assessment team. The				

link is as below:

https://www.recregistryindia.nic.in/index.php/general/publics/registered_regens

Based on the above observations CAR is closed.

CAR ID	03	Section no.	2.5	Date: 19/01/2018
Description of CAR				
During the desk review of the PDD and onsite visit document verifications, APPLUS team observed following inconsistency in the additionality determination :				
1. The Insurance amount is considered from As per TAC order 2001, Sheet No. 31. The same is not appropriate as the Board decision for individual project owner is around 2016. 2. Loan Application and sanction letter is missing 3. MAT has been provided throughout. Please clarify whether the company is in MAT bracket and expected to be in MAT bracket throughout the operating life of the project. Kindly please submit the latest audit report 4. Third party PLF report and conformity to Annex 11 EB 48 is missing 5. Deration after 10 years of operation is considered. Please explain or provide evidence for the same 6. The amount of O&M price as mentioned for Dhar project is 5.546 (in Million). However, the offer letter mentions the rate as Rs. 16, 00,000 per WEC per Annum (Exclusive of any Taxes). Kindly please explain the calculation. Please individually do the exercise for other IRR sheets as per the offer letter or DPR 7. The project Cost including Erection and Commission for the Dhar site mentions the cost as One Hundred Seventy Eight Crores Fifty Lakhs Only. However, IRR sheets mentions the cost as 315 (in millions). Please clarify the discrepancy and also for other site kindly mention the same in the reply and in IRR sheet. 8. Source for Land cost is missing for Dhar site. Kindly also explain the same for other IRR sheet 9. Common Practice analysis supporting documents and source of data is missing.				
Additionality section of the VCS PD version 01 is reserved till the documents and replies are submitted.				
Project participant response				Date: DD/MM/YYYY
1. The CERC order 2012, http://www.cercind.gov.in/2012/orders/RE_35_2012.pdf is the latest				

available source for insurance which mentioned 1% of capital cost for insurance, however PP has considered the 0.15% of capital cost as a conservative purpose. The transparent note is mentioned in IRR sheets and also in VCS PD.

2. Only Kerala site project activity involves debt and equity component and 70% loan and 30% equity is the standard accounting practise in India. For other projects, there is 100% equity component and same is considered for IRR analysis.

For Kerala project site, the debt and equity ratio has been considered from Kerala State Electricity Regulatory Commission (Renewable Energy) Regulations, 2015.
[http://www.erckerala.org/regulations/KSERC%20\(Renewable%20Energy\)%202015%20-11.11.15.pdf](http://www.erckerala.org/regulations/KSERC%20(Renewable%20Energy)%202015%20-11.11.15.pdf)

3. The MAT is not applicable for the PP and project activity. The same has been confirmed from PPs other registered projects like UN10136, UN10165, UN9871, UN6437, UN5794 and UN3742. For proposed project activity, the corporate tax is applicable and same has been considered for all years of project activity. Hence MAT is not applicable for the proposed project activity.

MAT is calculated u/s 115JB of the income tax Act which is 18.5%, however PP is eligible for corporate tax and same is considered in IRR calculations.

Every company should pay higher of the tax calculated under the following two provisions of Tax liability as per the Normal provisions of income tax act (tax rate 30% plus 3% Edu cess plus surcharge (if applicable) or Tax liability as per the MAT provisions given in Sec 115JB (18.5 % of Book Profits Plus 3 % edu cess plus surcharge if applicable). Thus PP has applied corporate tax for the project activity.

4. The third party PLF report is submitted to DOE.
5. The TERI report has been submitted to DOE for deration of generation. Also MREC order dated 24/11/2003 has accepted the deration of wind turbine is 5% after 10 years. Also the PP's UN10136, UN10165 projects considered the deration for wind turbines. Thus for proposed project activity, PP has considered the same for IRR calculations. Even after neglecting the deration, the project activity remains additional.
6. There are 3 WTGs for Dhar site and each WTG have 16 Lakhs of O&M cost exclusive of tax. Thus with inclusion of tax, the O&M cost comes as 55.4 Lakhs i.e 5.54 million INR. The similar calculations are mentioned in each project site IRR sheet.
7. The wind projects requires around 7 crore per MW, thus for 4.5 MW Dhar project, 31.5 crore or 315 million cost is required. The IRR sheet has mentioned the same based on offer letter and is reasonable. As per actual agreement, the WTG supply cost is 26 crore 70 Lakhs and for erection & commissioning 2 crore 40 lakhs INR and 60 lakhs for Land cost. Thus total actual cost of Dhar site project is 29 crore 70 lakhs which is 5.71% lower than the offer cost. This variation is considered in sensitivity analysis. The same approach has been followed for other sites. The supporting documents for project cost are submitted to DOE.

8. Land cost has been considered from offer letter from supplier. The offer letter mentioned 40 lakhs per WTG as land cost and same is considered for IRR calculations. The actual Land agreement for Dhar site is also submitted to DOE which mentioned the 20 lakhs per WTG. The variation is covered in sensitivity analysis. The same approach has been followed for other sites. The supporting documents are provided to DOE. Wherever there is comprehensive project cost is available to PP and no separate land cost available, then that comprehensive project cost is not considered in IRR calculations.
9. The common practise analysis sheet has been provided to DOE. The Wind power directory 2016 has been referred to identify the list of projects for common practise analysis.

Documentation provided by project participant

Revised VCS PD

IRR sheets

ER estimation and Actual ER sheet

DOE assessment

Date: 16/02/2018

Following are the observations of the DOE:

1. Assessment team checked The CERC order 2012 and found that 1 % is allowed as capital cost for insurance however PP considered 0.15% as capital cost which is conservative. The explanation is acceptable and thus CAR is closed.
2. Assessment team observed that only Kerala site project activity involves debt and equity component and 70% loan and 30% equity is the standard accounting practise in India. For other projects, there is 100% equity component and same is considered for IRR analysis. Hence there is no requirement of loan sanction letter. Moreover, for Kerala project site, the debt and equity ratio has been considered from Kerala State Electricity Regulatory Commission (Renewable Energy) Regulations, 2015.

[http://www.erckerala.org/regulations/KSERC%20\(Renewable%20Energy\)%202015%20-11.11.15.pdf](http://www.erckerala.org/regulations/KSERC%20(Renewable%20Energy)%202015%20-11.11.15.pdf)

3. Assessment team noted that the MAT is not applicable for the PP and project activity. The same has been confirmed from PPs other registered projects like UN10136, UN10165, UN9871, UN6437, UN5794 and UN3742. For proposed project activity, the corporate tax is applicable and same has been considered for all years of project activity. Hence MAT is not applicable for the proposed project activity.

MAT is calculated u/s 115JB of the income tax Act which is 18.5%, however PP is eligible for corporate tax and same is considered in IRR calculations.

Every company should pay higher of the tax calculated under the following two provisions of Tax

liability as per the Normal provisions of income tax act (tax rate 30% plus 3% Edu cess plus surcharge (if applicable) or Tax liability as per the MAT provisions given in Sec 115JB (18.5 % of Book Profits Plus 3 % Education cess plus surcharge if applicable). Thus PP has applied corporate tax for the project activity. CAR is thus closed.

4. The 3rd party PLF reports for all the sites are checked and found correct by the assessment team. CAR is thus closed.
5. Assessment team observed that the MREC order dated 24/11/2003 has accepted the deration of wind turbine is 5% after 10 years. Also the PP's UN10136, UN10165 projects considered the deration for wind turbines. Thus for proposed project activity, PP has considered the same for IRR calculations. Even after neglecting the deration, the project activity remains additional. CAR is thus closed
6. Assessment team noted that there are 3 WTGs for Dhar site and each WTG have 16 Lakhs of O&M cost exclusive of tax. Thus with inclusion of tax, the O&M cost comes as 55.4 Lakhs i.e 5.54 million INR. The same approach is followed for other site as well. CAR is thus closed
7. Assessment team noted that the wind projects requires around 7 crore per MW, thus for 4.5 MW Dhar project, 31.5 crore or 315 million cost is required. The IRR sheet has mentioned the same based on offer letter and is reasonable. As per actual agreement, the WTG supply cost is 26 crore 70 Lakhs and for erection & commissioning 2 crore 40 lakhs INR and 60 lakhs for Land cost. Thus total actual cost of Dhar site project is 29 crore 70 lakhs which is 5.71% lower than the offer cost. This variation is considered in sensitivity analysis which is acceptable to the assessment team. The same approach is followed for other site as well. CAR is thus closed
8. Land cost has been considered from offer letter from supplier. The offer letter mentioned 40 lakhs per WTG as land cost and same is considered for IRR calculations. The variation of actual cost is taken care in sensitivity analysis and thus the same is acceptable to the DOE. The same approach is followed for other sites as well. CAR is thus closed.
9. The common practice analysis is checked and found correct by the assessment team. The guideline on common practice is followed and thus the same is acceptable to the DOE. CAR is thus closed.

CAR ID	04	Section no.	3	Date: 19/01/2018
Description of CAR				
Assessment team found during desk review is that emission reduction sheet is provided however section CEA database used is version 11. The latest version available is version 12. Corrective action is sought for the same.				
Project participant response				Date: 23/01/2018
The VCS PD was listed on VCS registry on April 2017 and at the time of listing the project, version 11 of CEA database was latest available and hence same is considered for project activity. The latest version of CEA database version 12 is published in May 2017, and was not available during listing the VCS PD. Hence version 11 of CEA database is applied for the project activity.				
Documentation provided by project participant				
Revised VCS PD				
ER estimation and Actual ER sheet				
DOE assessment				Date: 16/02/2018
The explanation is acceptable to the assessment team as version 11 of CEA database was available to PP during the Joint PD and MR submission to DOE. Hence, version 11 is used for emission factor calculation. CAR is thus closed.				

CAR ID	05	Section no.	4	Date: 19/01/2018
Description of CAR				
The state wise monitoring procedure is not described and thus the monitoring section is reserved.				
Project participant response				Date: 23/01/2018
The project activity is located in Madhya Pradesh, Gujarat and Kerala states of India. In Indian scenario the monitoring, metering arrangement, apportioning procedure, calibration frequency and feeder arrangement is under control of respective state electricity board and PP do not have any control on it. Thus there is possibility of changes in monitoring procedures, meters, feeders for the project activity. PP is getting the net electricity supplied to grid and based on this value invoice will be raised by PP. Hence these details are not mentioned in VCS PD. As per methodology, the net electricity supplied to grid is monitored parameter and same is mentioned in VCS PD. The JMR and invoices for each state has been provided to DOE for the parameter net electricity supplied				

to grid.

Documentation provided by project participant

Revised VCS PD

DOE assessment

Date: 16/02/2018

The JMR sheets and invoices are submitted to the DOE. The JMR sheets is used in every state as the source of export and import for Net electricity calculation. The invoices are then cross checked by the DOE to match with the JMR values.

The Calculation of Net electricity exported to the grid is not in the control of project participant and the same is done by respective state electricity grid. As per the sectoral knowledge of DOE goes this is acceptable and thus CAR is closed.

CAR ID	06	Section no.	5.1	Date: 19/01/2018
Description of CAR				
The no Net harm details are missing in the VCS PD. Moreover, as VCS PD claims that there are no negative impacts on air, water, soil quality and ambience are envisaged due to the project activity however supporting and explanation of the same is missing.				
Project participant response				Date: 23/01/2018
There are no any negative environmental and socio economic impacts due to wind projects. The report on "Developmental Impacts and Sustainable Governance Aspects of Renewable Energy Projects" prepared by MNRE dated September 2013. This report clearly mentioned that wind project activity operations do not result in direct air pollution, noise pollution. Please refer below web link http://mnre.gov.in/file-manager/UserFiles/report-on-developmental-impacts-of-RE.pdf				
Documentation provided by project participant				
Revised VCS PD				
DOE assessment				Date: 16/02/2018
Assessment team conforms that since the project is a renewable energy project and thus do not have any impacts on air pollution, noise pollution. Moreover, as per the directive of MNRE, Govt of India renewable project do not have direct impact on air or noise pollution. Thus assessment team conforms that there are no any negative environmental and socio economic impacts due to wind projects. CAR is thus closed.				

CAR ID	07	Section no.	5.3	Date: 19/01/2018
Description of CAR				
During the desk review related to stakeholder consultation following observation is made by the APPLUS project team:				
1. The site photograph of LSHC meeting is not provided to the DOE.				
Corrective action is this sought for the same.				
Project participant response				Date: 23/01/2018
The site photographs are submitted to DOE.				
Documentation provided by project participant				
Site photographs				
DOE assessment				Date: 16/02/2018
The local stakeholder MOM, attendance sheets are checked and found correct by the assessment team. Moreover, assessment team checked the stakeholder meeting photographs and also had an interaction during the site visit. All the stakeholders are happy with the implementation of the project activity in each state and thus assessment team conforms that stakeholders meeting is carried out adequately. CAR is thus closed.				

FOR VERIFICATION:

CAR ID	08	Section no.	6	Date: 19/01/2018
Description of CAR				
During the site visit and subsequent document review it was observed that the details of feeder wise WTG location is missing in the MR. Corrective action is sought in the respective section of the MR.				
Moreover, the actual value is yellow highlighted in the MR. Corrective action sought for the same.				
Project participant response				Date: 23/01/2018
The project activity is located in Madhya Pradesh, Gujarat and Kerala states of India. In Indian scenario the monitoring, metering arrangement, apportioning procedure, calibration frequency and feeder arrangement is under control of respective state electricity board and PP do not have any control on it. Thus there is possibility of changes in meters, feeders for the project activity. PP is getting the net electricity supplied to grid and based on this value invoice will be raised by PP. Hence these details are				

not mentioned in VCS PD.

The VCS PD is revised with mention of above information. The yellow highlighted text is removed and actual value of net electricity supplied is mentioned in revised VCS PD and MR.

Documentation provided by project participant

Revised VCS PD

DOE assessment

Date: 16/02/2018

The explanation is acceptable to the DOE. CAR is thus closed.

CAR ID	09	Section no.	6	Date: 19/01/2018
Description of CAR				
The breakdown details of the WTGs are missing in the MR. Moreover, the supporting document regarding the breakdown details are also not provided to the assessment team. Corrective action is sought in the respective section of the MR and supporting documents for further analysis.				
Project participant response				Date: 23/01/2018
The breakdown details are provided to DOE in excel sheet. There is no any impact on the project activity due to break down. The JMR reflects actual net electricity supplied to grid and same is used for ER calculations. Thus break down do not have any impact on ER calculations.				
Documentation provided by project participant				
Breakdown details				
DOE assessment				Date: 16/02/2018
The breakdown details log sheets is checked by the assessment team and it is observed that scheduled maintenance is observed in each state as per the manufacturer's recommendation. No unforeseen incident observed by the DOE and thus CAR is closed.				

CAR ID	10	Section no.	6	Date: 19/01/2018
Description of CAR				
The Invoices for complete monitoring period for individual project owner is missing. The assessment on emission reduction calculation is thus reserved until the documents are submitted. The comparison of actual VER and estimated VER is missing for the monitoring period.				
Project participant response				Date: 23/01/2018
The invoices are submitted to DOE for cross checking purpose. The comparison of actual emission reduction with estimated emission reductions are mentioned in ER sheet. The actual ER are less than estimated ER due to low PLF and few WTGs were commissioned at later period of monitoring period.				
Documentation provided by project participant				
Revised VCS PD Revised ER sheet				
DOE assessment				Date: 16/02/2018
The invoices are now submitted to the assessment team. The same is checked with the JMR values and found correct. The comparison of actual emission reduction with estimated emission reductions are mentioned in ER sheet. The actual ER are less than estimated ER due to low PLF and few WTGs were commissioned at later period of monitoring period. CAR is thus closed.				

APPENDIX 3: COMPETENCE OF TEAM MEMBERS AND TECHNICAL REVIEWERS**Verification team member**

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk review	On-site inspection	Interview(s)	Verification findings
1.	Team Leader/Lead Assessor	OR	DAS	SUKANTA	TQC-Outsourced entity	Yes	Yes	Yes	Yes

Technical reviewer and approver of the verification and certification report

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer (TR)	IR	Xue	Denny	LGAI TC (APPLUS+ CERTIFICATIONS)
2.	Approver	IR	Sendin	Juan	LGAI TC (APPLUS+ CERTIFICATIONS)

Short CVs of the Team:

1. Mr. Sukanta DAS, has done M. SC in (Electronics and Photonics) and M. Tech in (Energy technology) from Tezpur Central University/ Indian Institute of technology Bombay in India. He is a certified lead auditor for ISO 14001 EMS LA and ISO 9001 QMS LA from International registry for Certified Auditors (IRCA) and Certified Lean Management practitioner from Quality Council of India (QCI). He has more than Nine (9) years of working experience at TUV NoRD/ Re-consult/CRA/APROJECT OWNERSLUS certifications under various categories of projects stating from Renewable to waste to supercritical projects. He was JI/ CDM Lead Assessor in TUV NoRD and was involved in more than 100 CDM validation and verifications activities in Gold Standard, VCS, CDM projects as a team leader/technical reviewer / validator / verifier covering the sectoral scope 1, 13 technical areas 1.2/1.1/13.1. Currently he is associated with True Quality Certifications Private Limited and is empanelled with APROJECT OWNERSLUS certification to carry out GHG audit.
2. Hanshen (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 1.5 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.

APPENDIX 4: ABBREVIATIONS

Abbreviations	Full texts
APERC	Andhra Pradesh electricity regulatory commission.
BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction(s)
CEA	Central Electricity Authority
CL	Clarification request
CM	Combined Margin
CMS	Central Monitoring system
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent

DNA	Designated National Authority
DOE	Designated Operational Entity
DR	Document Review
EF	Emission Factor
EIA	Environmental Impact Assessment
ER	Emission Reductions
FAR	Forward Action Request
GHG	Greenhouse gas(es)
GERC	Gujarat Electricity regulatory commission
GWP	Global Warming potential
APERC	Andhra Pradesh Electricity regulatory commission
MPERC	Madhya Pradesh Electricity regulatory commission
JMR	Joint Metering reading
RBI	Reserve Bank Of India
SERC	State Electricity regulatory commission

APPENDIX 5: CALIBRATION DETAILS OF THE PROJECT ACTIVITY (UNDERGONE VERIFICATION)

The Main and Check Meter details for Dhar Site, Madhya Pradesh are as follows:

The WTGs are commissioned on 31/03/2016 and calibration is done prior to commissioning date for this site

Meter Details for WTG ID: TIR- 11			
Main Meter		Check Meter	
Make	Secure	Make	Secure
Meter Sl. No	XD500605	Meter Sl. No	XD500606
Accuracy Class	0.2 s	Accuracy Class	0.2 s
Calibration Date ¹⁴	19/03/2016	Calibration Date	21/03/2016

Meter Details for WTG ID: ADD- 01 & ADD- 06			
Main Meter		Check Meter	
Make	Secure	Make	Secure
Meter Sl. No	XD500602	Meter Sl. No	XD500603
Accuracy Class	0.2 s	Accuracy Class	0.2 s
Calibration Date ¹⁵	21/03/2016	Calibration Date	19/03/2016

The Main and Check Meter details for Ghatiya Site, Madhya Pradesh are as follows:

¹⁴ The frequency of calibrating the energy meter is once in 5 year. As the calibration of the Main Meter was on 19/03/2016 and the Check Meter was calibrated on 21/03/2016, the calibration certificate for the Main Meter is valid till 18/03/2021 and for the Check Meter, the calibration certificate is valid till 20/03/2021.

¹⁵ The frequency of calibrating the energy meter is once in 5 year. As the calibration of the Main Meter was done on 19/03/2016 and the Check Meter was calibrated on 21/03/2016, the calibration certificate for the Main Meter is valid till 18/03/2021 and for the Check Meter, the calibration certificate is valid till 20/03/2021.

The WTGs are commissioned on 28/03/2016 and 29/03/2016 and calibration is done prior to commissioning date for this site.

Meter Details for WTG ID: RGP2- 08 & RGP2- 09 at Feeder-1			
Main Meter		Check Meter	
Make	Secure	Make	Secure
Meter Sl. No	XD500608	Meter Sl. No	XD500609
Accuracy Class	0.2 s	Accuracy Class	0.2 s
Calibration Date ¹⁶	24/03/2016	Calibration Date	
Meter Details for WTG ID: RGP2- 18, RGP2- 03 & RGP2- 07 at Feeder-2			
Main Meter		Check Meter	
Make	Secure	Make	Secure
Meter Sl. No	Y0056943	Meter Sl. No	Y0056944
Accuracy Class	0.2 s	Accuracy Class	0.2 s
Calibration Date ¹⁷	24/03/2016	Calibration Date	24/03/2016

The Main and Check Meter details for Gujarat sites are as follows:

The WTGs are commissioned on 30/03/2017 and 31/03/2017 and calibration is done prior to commissioning date for this site

Meter-1		Meter-2	
Make	Secure	Make	Secure
Meter Sl. No	GJ 3710 A	Meter Sl. No	GJ 3711 A

¹⁶ The frequency of calibrating the energy meter is once in 5 year. As the calibration has been done on 24/03/2016, the calibration certificate is valid till 23/03/2021.

¹⁷ The frequency of calibrating the energy meter is once in 5 year. As the calibration has been done on 24/03/2016, the calibration certificate is valid till 23/03/2021.

Accuracy Class	0.2 s	Accuracy Class	0.2 s
Calibration Date ¹⁸	30/01/2017	Calibration Date	30/01/2017

The Main and Check Meter details for Kinfara site, Kerala are as follows:

The WTGs are commissioned on 28/03/2017 and calibration is done prior to commissioning date for this site

Meter Details for Feeder- 1			
Main Meter		Check Meter	
Make	L & T	Make	L & T
Meter Sl. No	16088079	Meter Sl. No	16088085
Accuracy Class	0.2 s	Accuracy Class	0.2 s
Calibration Date ¹⁹	25/03/2017	Calibration Date	25/03/2017
Meter Details for Feeder- 2			
Main Meter		Check Meter	
Make	L & T	Make	L & T
Meter Sl. No	16088074	Meter Sl. No	16088092
Accuracy Class	0.2 s	Accuracy Class	0.2 s
Calibration Date ²⁰	27/03/2017	Calibration Date	27/03/2017

¹⁸ The frequency of calibrating the energy meter is once in 5 year. As the calibration has been done on 30/01/2017, the calibration certificate is valid till 29/01/2022.

¹⁹ The frequency of calibrating the energy meter is once in 5 year. As the calibration has been done on 25/03/2017, the calibration certificate is valid till 24/03/2022.

²⁰ The frequency of calibrating the energy meter is once in 5 year. As the calibration has been done on 27/03/2017, the calibration certificate is valid till 26/03/2022.