

VALIDATION REPORT

GRID CONNECTED WIND ENERGY PROJECT IN GUJARAT



Document Prepared By LGAI Technological Center, S.A. (Applus+ Certification)

Project Title	Grid Connected Wind Energy Project in Gujarat
Version	02.1
Report ID	VCS.VAL.1968

Report Title	Validation report of Grid Connected Wind Energy Project in Gujarat
Client	CLP India Private Limited
Pages	54
Date of Issue	16/12/2019
Prepared By	LGAi Technological Center, S.A. (Applus+ Certification)
Contact	Campus UAB – Ronda de la Font del Carme, s/n 08193 Bellaterra – Barcelona (Spain) Tel.: +34 93 567 20 08 Fax.: +34 93 567 20 01 www.appluscertification.com agustin.calle@applus.com carla.debat@applus.com
Approved By	Juan Sendin Caballero, LGAI Technological Center S.A. (Applus+ Certification) B.U. Managing Director
Work Carried Out By	Lead Auditor & Technical Expert: Vivek Kumar Ahirwar Technical Reviewer & Technical Expert: Simon Shen

Summary:

LGAI Technological Center, S.A. (Applus+ Certification) has been contracted by CLP India Private Limited (Project proponent and the focal point of communication with VERRA) to conduct the validation of the project - "Grid Connected Wind Energy Project in Gujarat" (hereinafter also referred to as Project Activity), with regard to the relevant requirements of VCS programme guidelines and standard (VCS standard version 3.7, & VCS program guide version 3.7). Relevant requirements of the UNFCCC for CDM project activities, as well as criteria for consistent project operations, monitoring and reporting has been applied for validation.

The purpose of a validation is to have an independent third party assessment of the project design. In particular, the project's baseline, monitoring plan, and the project's compliance with relevant VCS criteria are validated in order to confirm that the project design, as documented, is sound and reasonable and meets the identified criteria. Validation is a requirement for all VCS projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of Verified Carbon Units (VCUs).

The validation includes confirming the implementation of the monitoring plan of the validated VCS PD (Project pipeline ID 1968) and the application of the monitoring methodology as per ACM0002 version 19.0: "Grid-connected electricity generation from renewable sources". Project Proponent has very recently won this project under competitive reverse bidding process conducted by Solar Energy Corporation of India Ltd., Govt. of India. Presently, project proponent has just initiated the land identification, micro-setting and project construction planning. Thus, PP has considered start date of the project would be 01/06/2021 or the commissioning date of the first WTG whichever occurs later. As actual project location has not finalized at the time of validation, thus validation team as decided not to visit the site. Same would be confirmed at the time of first verification. A Forward Action Request (FAR) has also raised in this regard.

The VCS Project activity is promoted by CLP India Private Limited (CLP). CLP is developing a 250.8 MW wind project in Devbhoomi Dwarka district in the state of Gujarat, India. The main purpose of this project activity is to generate electricity through renewable energy source and to sale the same to Indian grid. The project activity would utilize wind energy to generate clean power with a view to bring in greenhouse gas emission reductions. The project activity has been planned to be implemented with capacity of 250.8 MW (114*2.2 MW) which would use Siemens Gamesa SG122 machine and utilize wind power to generate clean power with a view to bring in greenhouse gas emission reductions.

The project activity would involves generation of electricity by using the renewable energy source (i.e. wind) supplying to the Indian electricity grid. Thus, the project aims to displace electricity produced by fossil fuel power plants by harnessing wind energy. Therefore, the project would reduce greenhouse gas emissions and thereby contributes to sustainable development. The project being a renewable energy generation activity, leads to reduction in fossil fuel dominated electricity generation. The project activity results in reductions of greenhouse gas (GHG) emissions that are real, measurable, and verifiable and also plays beneficial role in the mitigation of climate change.

The project proponent has applied the baseline and monitoring methodology ACM0002, Version 19.0.0: "Grid-connected electricity generation from renewable sources". The project activity involves installation of 250.8 MW wind power project in the above mentioned location in the state of Gujarat (India).

The proposed project activity is a Green field project which results in an estimated GHG emission reduction of 759,489 tCO₂e per year (the calculated annualized average value as per ex-ante calculation) and a total of 7,594,890 tCO₂e over 10 years of the crediting period. The power generated by the project will be replacing the equivalent amount of electricity from the Grid system of India, which is dominated by fossil fuel based grid connected power plants.

A risk based approach has been followed to perform this validation. In this course of validation 06 Corrective Action request (CARs), 01 Clarification request (CLs) and 01 Forward Action Request (FAR) were raised and successfully closed.

The review of the project design documentation and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews and stakeholders have provided Applus+ Certification with sufficient evidence to validate the fulfillment of the stated criteria.

In detail the conclusions can be summarized as follows:

- The project is in line with all relevant host country criteria (India) and all relevant VCS and UNFCCC requirements for CDM
- The project additionality is sufficiently justified in the VCS PD document.
- The monitoring plan is transparent and adequate.
- The calculation of the emission reductions is carried out in a transparent and conservative manner, so that the calculated emission reductions of 7,594,890 tCO₂e are most likely to be achieved within the 10 years crediting period. Further, due to expected longer technical lifetime of the project, project can be further renewed under VCS crediting period.

Validation Conclusion:

The conclusions of this report show, that the project, as it was described in the project documentation, is in line with all criteria applicable for the validation. This validation is based on the information made available to Applus+ Certification and the engagement conditions are detailed in this report. No restrictions or uncertainties were identified related to the validation.

Applus+ Certification confirms that the project is implemented in accordance with the validated VCS PD. The monitoring system is in place and the expected emission reductions are calculated without material misstatements. Our opinion relates to the projects GHG emissions and the resulting GHG emission reductions reported and related to the valid and registered project baseline and monitoring and its associated documents. Based on the information seen and evaluated we confirm that the implementation of the project will result in 759,489 tCO₂e emission reduction per year during 10 years crediting period 01/06/2021 to 31/05/2031.

Table of Contents

1	Introduction	6
1.1	Objective.....	6
1.2	Scope and Criteria	6
1.3	Level of Assurance	7
1.4	Summary Description of the Project.....	7
2	Validation Process	8
2.1	Method and Criteria.....	8
2.2	Document Review	8
2.3	Interviews	9
2.4	Site Inspections.....	9
2.5	Resolution of Findings	10
2.5.1	Forward Action Requests.....	11
3	Validation Findings.....	11
3.1	Project Details	11
3.2	Application of Methodology	15
3.2.1	Title and Reference	15
3.2.2	Applicability.....	15
3.2.3	Project Boundary	19
3.2.4	Baseline Scenario.....	19
3.2.5	Additionality	20
3.2.6	Quantification of GHG Emission Reductions and Removals	36
3.2.7	Methodology Deviations.....	38
3.2.8	Monitoring Plan.....	38
3.3	Non-Permanence Risk Analysis.....	43
4	Safeguards.....	43
4.1	No Net Harm	43
4.2	Environmental Impact.....	43
4.3	Local Stakeholder Consultation.....	43
4.4	Public Comments.....	44
5	Validation conclusion.....	44
	APPENDIX 1: Document Reference	46

APPENDIX 2: Abbreviations.....	48
APPENDIX 3: Competency Statement.....	49
APPENDIX 4: Findings Overview.....	51

1 INTRODUCTION

1.1 Objective

Applus+ Certification has been contracted by CLP India Private Limited (Project proponent), to undertake the validation of the renewable energy project titled “Grid Connected Wind Energy Project in Gujarat” The validator has reviewed the project description, monitoring methodology and implementation plan of the project.

The purpose of this validation is to have an independent third party assessment of whether the project activity conforms to the qualification criteria set out in the VCS Version 3.7 standard to attain real, measurable, additional and permanent emission reductions. The validation statement/opinion is a written assurance that:

- The project complies with all the applicable VCS requirements and has the ability to generate the emission reductions stated over the project's crediting period.
- The validation followed the requirements of the current version of the VCS Standard Version 3.7 and VCS program guide 3.7 to ensure the quality and consistency of the validation work and the report.
- The project has resulted in emission reductions as declared by the organisation or GHG project's GHG assertion;
- The data reported is accurate, complete, consistent, transparent and free of material error or omission.

1.2 Scope and Criteria

The validation scope is given as an independent and objective review of the project design, the project's baseline study and monitoring plan which is included in the VCS PD and other relevant supporting documents.

The scope of work covered in the validation is described below:

- To validate whether the project activity meets the requirements of VCS Standard Version 3.7, VCS Validation and VCS program guide 3.7 including additionality, proof of title and compliance with local laws.
- To evaluate whether the baseline and monitoring plan are in conformance with the applied methodology from the VCS approved GHG program
- To confirm that the information presented are completed, consistent, transparent and free of omission or material error
- Background investigation and follow up interviews
- Issuance of draft validation report with CARs, CRs & FARs, if any
- Final validation opinion

The information in the VCS PD is reviewed against the criteria of VCS Standard 3.7, the VCS program guide 3.7 and the approved baseline and monitoring CDM methodology ACM0002, version 19.0.

Applus+ Certification has performed validation based on a risk based approach focusing mainly on the significant risks to meet the qualification criteria and the ability to generate Verified Carbon Units (VCUs).

1.3 Level of Assurance

The 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 project activity comprises installation of a grid connected wind power based power project with a total capacity of 250.8 MW. The proposed project activity is a renewable wind electricity generation project and supplying power to the unified Indian Grid system. The power generated by the project will be replacing the equivalent amount of electricity from the Indian Grid system of India, which is dominated by fossil fuel based grid connected power plants. The project activity will be implemented in multiple locations in the district of Dwarka, in the state of Gujarat, India. Project is at very initial stage of implementation and land identification is on progress. The project activity is expected to be commissioned on 01/06/2021.

The Letter of Award (LoA)/07/ is reviewed by the validation team and found to be appropriate.

2 VALIDATION PROCESS

2.1 Method and Criteria

For Validation:

The validation process is undertaken by validation team that involves the following:

- The desk review of documents and evidences submitted by the project proponent in context of the reference VCS rules and guidelines,
- Reporting audit findings with respect to clarifications and non-conformities and the closure of the findings, as appropriate and
- Preparing a draft validation report
- Resolution of outstanding issues and the issuance of final validation report and opinion

In order to ensure transparency, a validation protocol was prepared for the project according to the VVS for PAs version 02.0 validation requirements and VCS Standard version 3.7. The Clarification Requests (CR) were issued where additional information was needed to clarify issues, and Forward Action Requests (FAR) for issues relating to project implementation that required review during the first verification of the project activity.

2.2 Document Review

For Validation:

The validation team has conducted the validation using the VCS Standard and the ACM0002 version 19.0 methodology as the reference criteria. The validation team had done the completeness check of VCS PD submitted by the PP as per the VCS standard Version 3.7 requirements was reviewed. Furthermore, a desk review was also carried out to assess the following:

- Information of project details in compliance with VCS PD template
- Appropriateness of methodology ACM0002 version 19.0 applied to the project activity
- Compliance with relevant laws and regulations
- Correctness of application of baseline and monitoring methodology
- Demonstration of additionality
- Monitoring plan described in the VCS PD
- Stakeholder consultation
- Proof of listing of project under pipeline

- Calculation of grid emission factor, etc. where applicable.

The VCS PD version 01 dated 02/10/2019 /1/ was initially reviewed and the PP requested to submit the revised documents along with the supporting information and documents. The revised documents and additional supporting documents were further assessed by the validation team during desk review. During the validation process, the revised VCS PD (version 02) /1/ and the supporting documents were assessed to confirm the actions taken by the PP to the CARs and CLs issued.

The validation team has reviewed the final version of the VCS PD (i.e. Version 2.0 dated 01/12/2019) to confirm that all changes agreed have been incorporated adequately. It was verified by the validation team that the project was listed in the VCS pipeline in line with the requirements (Section 3, Registration and Issuance process, version 3.8) Ref: https://www.vcsprojectdatabase.org/#/pipeline_details/PL1968

2.3 Interviews

The assessment team has carried out interviews in order to verify the information included in the project documentation and to gain additional information regarding the compliance of the project with the VCS requirements. The assessment team has telephonically interviewed the representatives of the PP to confirm selected information and to clarify issues identified during the document review. Representatives of the PP and O&M contractor were also interviewed to confirm the monitoring procedure to be implemented after project commissioning. The names and designations of the personnel interviewed are mentioned in section 2.4 below.

The main topics covered during the interview are as follows:

- General Aspects of the project
- Project Implementation
- Equipment and operation
- Staff Training procedures
- Calibration procedures
- Monitoring & Measuring System
- Data collection, recording and archiving procedure
- QA/QC procedures
- VCS documentation
- Emission reduction calculations

2.4 Site Inspections

Project Proponent has very recently won this project under competitive reverse bidding process conducted by Solar Energy Corporation of India Ltd., Govt. of India. Presently, project proponent has just initiated the land identification, micro-setting and project construction planning.

As project implementation not yet started, thus, assessment team has decided not to visit the project site. Thus, as part of the validation, assessment team has taken telephonic interview on 19/11/2019 of PP and other stockholders.

Further, assessment team has raised FAR and as per that the verifying VVB shall verify the implementation of the project in accordance the description provided in the validated PD assess the site condition during the during the first verification process.

2.5 Resolution of Findings

The objective of this step is to identify, discuss and conclude on the issues related to the project description, technical specification, baseline and additionality, monitoring parameter and monitoring plan, implementation status and operations of the project activity that could impair the capacity of the project activity to achieve emission reductions or influence the monitoring and reporting of emission reductions. This is done based on the desk review and telephonic discussion. The validation team prepares and/or updates a validation protocol (internal document) that records the conformities and non-conformities, which may be of following types;

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

- Non-compliance with the project description, applicability of monitoring methodology and its tools, additionality tools and has not been sufficiently documented by the project participants, or if the evidence provided to prove conformity is insufficient;
- Non-compliance with the monitoring plan, the methodology or the standardized baseline are found in monitoring and reporting and has not been sufficiently documented by the project participants, or if the evidence provided to prove conformity is insufficient;
- Modifications to the implementation, operation and monitoring of the registered project activity has not been sufficiently documented by the project participants;
- Mistakes have been made in applying assumptions, data or calculations of emission reductions that will impact the quantity of emission reductions;

Issues identified in a FAR during validation to be verified during verification or previous verification(s) have not been resolved by the project participants.

Clarification request (CR) is raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met. All CARs and CRs raised by the Applus+ Certification during validation and verification shall be resolved prior to submitting a request for registration and issuance.

During the current validation, 06 Corrective Action request (CARs) 01 Clarification request (CRs) and 01 Forward Action request (FAR) were raised and successfully closed.

All the findings that are raised and communicated to project participant during the validation are included under Appendix 4. The section also includes the response, if provided, by the project participants and an assessment by the validation team if it was closed out or otherwise.

2.5.1 Forward Action Requests

Forward Action Request (FAR) raised to assess the project implementation requirement when the monitoring and reporting require attention and/or adjustment for the next verification period. FARs does not relate to VCS requirements for issuance of ERs achieved during subject monitoring. FARs subject to project implementation plan.

Applus+ Certification has raised 01 FAR during this validation process to access the project implementation, monitoring plan, capacity of plant at the time of 1st verification.

3 VALIDATION FINDINGS

3.1 Project Details

Project type, technologies and measures implemented, and eligibility of the project:

As per the project type defined by the UNFCCC and VCS standard version 3.7 Guidelines, the project activity is falls under type-I (Renewable energy projects) and the list of Sectoral the sectoral scope 1 - Energy Industries (renewable/ non-renewable sources).

The project activity consists of the installation of 250.8 MW wind power project in the state of Gujarat. This is a proposed project activity, which is currently under pre-construction stage and pre- commissioning stage. Hence, the proposed start date of the project is a futuristic date which is considered as per “Scheduled COD”, which is 01/06/2021. This is checked and confirmed from the LoA issued by Solar Energy Corporation of India Ltd., Govt. of India. /07/ of the project activity.

The proposed project activity is a Green field project which results in an estimated GHG emission reduction of 759,489 tCO₂e per year (the calculated annualized average value as per ex-ante calculation) and a total of 7,594,890 tCO₂e over 10 years of the crediting period.

The project would use wind energy technology by Siemens-Gamesa and implement 114 numbers of WTGs of SG122 model with a capacity of 2.2 MW each. The technical details of the technologies are mentioned below:

Turbine model	Siemens-Gamesa SG122
OPERATING DATA	
Rated power	2.2 MW
Nacelle weight	88.5 T
Blade	
Length	60 m
Wight	14 T
Break	Mechanical, disc brake

Turbine model	Siemens-Gamesa SG122
ROTOR	
Diameter	122 meters
Swept area (m ²)	11,690
Wind speed in operation (r/min)	13.07
GENERATOR	
Type	Double-fed with coil rotor and slip rings
Voltage	690 V _{AC}
Frequency	50Hz

The average life time of the WTGs under project activity is considered as 25 years in line with tariff order issued by the Gujarat state electricity regulatory commission.

The purpose of the project activity is to generate the electricity by the utilization of wind energy and is being supplied to Indian grid. The project activity will generate greenhouse gas (GHG) emission reductions by avoiding GHG emissions which otherwise would have been generated by the operation of grid connected power plants and by the addition of new sources. Hence the project accomplishes VCS conditions.

Project proponent and other entities involved in the project:

The project activity is developed by CLP India Private Limited and having overall operational control and ownership of the Project activity. CLP is the “Project Proponent” and the “Sole Focal Point” for all the communications with the DOE, VCS Board and Registry; and to take all the necessary actions for the project under VCS mechanism as and when required.

Project start date:

As per VCS guidelines, the project start date is the date on which the project is commissioned. Further, this is a proposed project activity, which is currently under pre-construction and pre-commissioning stage. Hence, the proposed start date of the project is a futuristic date which is considered as per “Scheduled COD” in line with the SECI LoA, which is 01/06/2021.

Project crediting period-

The crediting period of the project activity is considered for 10 years (renewable). The first crediting period is from 01/06/2021 to 31/05/2031.

Project scale and estimated GHG emission reductions or removals:

The estimated annual emission reductions for the project activity are 759,489 tCO₂e per year (proposed annualized average value) is higher than 300,000 tCO₂e. Hence the category is applicable under “Large Project”.

Project location:

The proposed wind project, located in Gujarat, is approximately 45 km to the west of Jam Khambhalia, and 80 km southwest of city Jamnagar, Gujarat, India.

Conditions prior to project initiation:

This greenfield project activity involves installation of new 250.8 MW wind energy based plant for generating electricity. In the absence of the project activity, the equivalent power generation would have taken place from the fossil fuel dominated Indian Grid. Prior to implementation of this project activity, there were no project activities at site. Same amount of electricity was generated from other grid connected power plant. The main emission in the pre-project scenario is the power plants connected to the Indian Grid, and main GHG involved is CO₂.

Project compliance with applicable laws, statutes and other regulatory frameworks:

The project is a voluntary initiative by the project proponent and has not been implemented to meet any local / national laws or regulatory compliances. The project activity is in compliance with current laws and regulations and there are no legal and/or regulatory requirements that prevent the project implementation. There is following act/regulations prevailing in the state:

1. Electricity Act 2003 (<https://www.gercin.org/electricityact-2003/>)
2. GERC RE regulations (<https://www.gercin.org/regulation-category/re-regulations/>)
3. Gujarat ACT NO. 24 OF 2003 (<https://www.gercin.org/gujaratact-2003/>)

Also the validation team has confirmed that there is no such compliance requirement with an emission trading program or any binding limits on GHG emissions for the project activity in India (host country) as it is a non-annex 1 country.

CLP India won this project under competitive reverse bidding process conducted by Solar Energy Corporation of India Ltd. Govt. of India. The project has received necessary approvals for development and commissioning from the state nodal agencies and is in compliance to the local laws and regulations. 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

Ownership and other programs-**Right of use**

The Project is developed and owned by CLP India Private Limited, who is project proponent and the focal point of this VCS project, and to receive VCUs and remain focal point of communication at the registry /27/.

The ownership of the project activity is verified through the following documents:

- Letter of Award (LoA) for the project activity in the name of CLP India Private Limited issued by Solar Energy Corporation of India Ltd. (SECI), Govt. of India/07/

Emissions trading programs and other binding limits

The project is not participating in other emission trading programs. The letter of undertaking/23/ has been furnished by project participant confirming that net GHG emission reductions or removals generated by the project will not be used for compliance with an emissions trading program or to meet binding limits on GHG emissions.

Other forms of environmental credit sought or received and eligible to be sought or received:

The project seeking registration under the VCS (Pipeline ID-1968) and not listed under REC mechanism/20/ as verified from <https://recregistryindia.nic.in/index.php/publics/index> .

Participation under other GHG programs:

Project is seeking registration under VCS only (Pipeline ID-1968). The PP has submitted the declaration/23/ which states that the net GHG emission reductions generated by the project activity will not be used for compliance with any other emissions trading program or to meet binding limits on GHG emissions for the same monitoring period.

Rejection by other GHG programs:

The project has not been rejected by other GHG programs.

Assessment on Sustainable development

The project activity would help to reduce the demand-supply gap in the country and also help in contributing to the sustainable development by using wind energy as the source of power generation and reduction of GHG emissions.

Ministry of Environment and Forests and Climate Change 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.

Additional information relevant to the project, including:

- **Eligibility criteria for grouped projects**

The project activity is not a grouped project, hence not applicable to the project activity.

- **Leakage management for AFOLU projects**

Not applicable to the project activity.

- **Commercially sensitive information**

No commercially sensitive information has been excluded from the public version of the project description. (Project is currently at pre-development and pre-commissioning stage)

Conclusion:

In view of the assessment of VCS PD/01/ and supporting documents as listed in Appendix 1 of this report, the validation team is able to confirm that the description contained in the VCS PD of the project activity provides the reader with a clear understanding of the precise nature of the project activity and the technical aspects of its implementation. Consequently, Applus+ Certification confirms that the project description of the project contained in the VCS PD/01/ to be complete and accurate. The VCS PD complies with the relevant forms and guidance for completing the VCS PD.

3.2 Application of Methodology

3.2.1 Title and Reference

The project activity has applied CDM approved methodology ACM0002 version 19.0.

Title: Grid-connected electricity generation from renewable sources

Tools referenced in the applied methodology:

- Tool to calculate the emission factor for an electricity system - Version 07.0 (EB 100, Annex 04)
- Methodological Tool- Tool for the demonstration and assessment of additionality - Version 07.0.0 (EB 70, Annex 08)
- Methodological tool for Investment analysis, Version-09.0 (EB 101, Annex 11)

3.2.2 Applicability

All applicability conditions of the updated version of the methodology (ACM0002 version 19.0) are met. Thus the methodology is deemed fully applicable for the new crediting period and no request for deviation with regards to the applicability of the methodology is required. All applicability conditions are completely and correctly included in the VCS PD.

Criteria-1.

This methodology is applicable to grid-connected renewable energy power generation project activities that: (a) Install a Greenfield power plant; (b) Involve a capacity addition to (an) existing plant(s); (c) Involve a retrofit of (an) existing operating plants/units; (d) Involve a rehabilitation of (an) existing plant(s)/unit(s); or (e) Involve a replacement of (an) existing plant(s)/unit(s).

Validation assessment:

- Project activity is Greenfield wind power project, supplying electricity to national grid. This is verified thorough the LoA issued by Solar Energy Corporation of India Ltd. (SECI), Govt. of India/7/.

Thus the criterion is fulfilled by the proposed project activity.

Criteria-2:

The methodology is applicable under the following conditions:

(a) 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, solar power plant/unit, wave power plant/unit or tidal power plant/unit;

(b) In the case of capacity additions, retrofits, rehabilitations or replacements (except for wind, solar, 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.

Validation assessment:

The project activity is the installation of a greenfield wind power plant. This is confirmed through LoA issued by Solar Energy Corporation of India Ltd. (SECI), Govt. of India/7/

Thus, the criterion (a) is applicable and (b) is not applicable for the proposed project activity.

Criteria-3:

The methodology is not applicable to:

(a) 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;

(b) Biomass fired power plants/units.

Validation assessment:

The project activity is the installation of a new wind power plant and does not involve switching from fossil fuels to renewable energy sources at the site of the project activity. This is confirmed through LoA issued by Solar Energy Corporation of India Ltd. (SECI), Govt. of India/7/.

Thus the criterion is not applicable for the proposed project activity.

Criteria-4:

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."

Validation assessment:

The project activity does not involve any capacity additions, retrofits or replacements of an existing facility because it is a Greenfield wind power generation project activity; same has been confirmed from physical inspection during the validation site visit.

Thus the criterion is not applicable for the proposed project activity.

The project activity is the installation of a wind based Power Generation project; it is not a hydro project, thus all conditions related to hydro plants are not applicable to the project activity (and not included in this section).

Thus, it can be concluded that the applied methodology ACM0002, version 19.0 is applicable to the project activity.

Further, the applied methodology refers to latest available versions of the following tools;

1. Tool to calculate the emission factor for an electricity system

The VCS PD /01/ refers and correctly applies the latest version of tool to calculate the emission factor for an electricity system, version 07.0 /05/. Also in the final version of the VCS PD, the PP has referred the CEA Baseline CO₂ Emission Database version 14, dated December 2018. This is the latest available database at the time of revised version of the VCS PD submission for validation of the project activity. The location of the project in the state of Gujarat in India. As per CEA Baseline CO₂ Emission Database/14/, the state of Gujarat comes under the Indian grid, the geographic and system boundaries of which are clearly identified; information on the characteristics of the grid is available. Thus, the tool is applicable for the project activity.

2. Tool for the demonstration and assessment of additionality

The latest version 7.0.0 of the "Tool for the demonstration and assessment of additionality"/10/ has been used by the PP. Since the additionally tool is included in an approved methodology, additionality tool needs to be applied for the project activity. Also PP is neither proposing new methodology nor proposing alternative methods to demonstrate additionality for consideration by the Executive Board. This it is concluded that the Tool for the demonstration and assessment of additionality is applicable for the project activity.

3. Combined tool to identify the baseline scenario and demonstrate additionality

The PP has used the “Tool to demonstration and assessment of additionality” in demonstration of additionality and the baseline has been developed in accordance with the applied baseline methodology. Hence, the combined tool is not used by the project participant.

4. Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion

Since there is no fossil fuel combustion involved in the project site or in the project boundary, this tool is not applicable to the proposed project activity and not used/applied by the project participant.

3.2.3 Project Boundary

The project boundary is given by the applied methodology, ACM0002, version 19.0.0:

“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.”

The purpose of this project activity is to generate electricity using renewable sources (wind) and export it to state grid of Gujarat which part of Indian grid, thereby displacing the grid generated electricity. The project boundary includes the wind project, sub-stations, grid and all power plants connected to grid, which has been illustrated in the Section 2.3 of the VCS PD /01/ and gives clear understanding of the project boundary; thus it is appropriate and acceptable to validation team.

The consideration, by the PP, of only CO₂ gas for the baseline emissions is conservative and also in line with the methodology. The exclusion of CH₄ & N₂O in the baseline scenario is appropriate. The project activity involves the generation of electricity using wind energy. Hence, there are no project emissions associated with this project activity. Hence, the exclusion of CO₂, CH₄ & N₂O in the project scenario are appropriate. There are no other sources of project emissions. Hence, the project participant has considered the project emissions as zero for project activity; this is in line with the methodology.

The assessment team is able to conclude that the project boundary and selected sources are applied as per the methodology and the applicable VCS criteria

3.2.4 Baseline Scenario

The project activity involves the installation of a newly built and grid-connected renewable power plant and supplying the generated electricity to Indian grid, hence, according to the applied methodology ACM0002, version 19.0.0, the baseline scenario is determined properly as:

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

The latest available version for “Tool to calculate the emission factor for an electricity system” is version 07.0 /05/ and the PP has correctly referred to the same in the section 3.1 of the final VCS PD /1/ for determining baseline grid emission factor and it is found to be correct.

The calculation for the operating margin and combined margin for the Indian Grid is readily available and published by the Central Electricity Authority, Government of India/14/. The CEA power sector data is referred by all CDM project in India in the ER calculation and it is yearly updated with recent data. The project activity has referred the CEA Baseline Carbon Dioxide Emission Database is version 14/14/ dated December 2018, which was the latest version available during submission of the PD.

The PP has used the simple operating margin calculation. The simple operating margin is calculated as an average of the latest available three years (at the time of revised PD submission for validation) i.e. 2015-16, 2016-17 and 2017-18. The value for weighted average operating margin has been validated and used as 0.9610 tCO₂/MWh. The Build margin for the Indian grid is considered as 0.8644 tCO₂/MWh. The weighted average combined margin has been calculated by the PP, considering the 75% weighted for operating margin and 25% for build margin; this is in accordance with the tool. The weighted average combined margin emission factor for the project activity comes to 0.93684 tCO₂/MWh. The PP has provided the calculation for the same in the ER calculation sheet and it was validated by the validation team. The baseline emission factor for the electricity system has been calculated on ex-ante basis and will remain fixed for the entire project crediting period.

The discussion on baseline is comprehensive in the VCS PD section 3.1 and it is in line with the applied baseline and monitoring methodology ACM0002 version 19.0.0. Also the identified baseline for the project activity is the most likely scenario of what would have occurred in the absence of the project activity and is confirmed by TA expert on the team; thus it is accepted. The project participant has included all sources and references used for baseline determination for the project activity in the PD/1/ and the identified baseline is justified appropriately by the project participant. The Baseline scenario and baseline emission calculations are found as per ACM0002 version 19.0.0/4/. The combined margin approach is the ex-ante approach as per tool to calculate the emission factor for an electricity system. Based on the requirements of paragraph 83 of the VVS version 02.0 /9/, the validation team confirm that:

- a) All the assumptions and data used by the PP are listed in the VCS PD, including their references and sources;
- b) All documentation used is relevant for establishing the baseline scenario and correctly quoted and interpreted in the PD;
- c) Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence and can be deemed reasonable;
- d) Relevant national and/or sectoral policies and circumstances are considered and listed in the PD;
- e) The approved baseline methodology has been correctly applied to identify the most reasonable baseline scenario and the identified baseline scenario reasonably represents what would occur in the absence of the proposed project activity.

3.2.5 Additionality

The proposed project activity is a large scale project and the additionality of the project activity was demonstrated on the basis of the “Tool for the demonstration and assessment of the additionality”, Version 07.0.0, approved by the CDM EB 70 and required by the methodology ACM0002, Version 19.0.0.

PP has adopted the step-wise approach for demonstrating and assessing the additionality of the project activity as follows:

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

The proposed project activity is a wind power project located in Gujarat which is using the latest available and proven technology. Thus, this project activity is not a first-of-its-kind project. The additionality of the project activity has demonstrated by using the investment analysis and the same has been discussed in the following steps. Thus, same is acceptable to the validation team.

Outcome of Step 0: *This project activity is not a first-of-its-kind project.*

Step1. Identification of alternatives to the proposed project activity consistent with current laws and regulations

As per the applied methodology ACM0002 version 19.0; Para 22, if the project activity is the installation of a Greenfield power plant, the baseline scenario is electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid connected power plant and by the addition of new generation sources. As the baseline scenario is prescribed by applied methodology, hence no further analysis is carried out to identify alternatives.

As the project activity involves the installation of a newly built and grid-connected renewable power plant that exports the generated electricity to the Indian grid system in India, hence, according to the methodology ACM0002 version 19.0, the baseline scenario is determined properly as:

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

The approved methodology that is applied prescribes the baseline scenario, and the same has been opted in this project, therefore, no further analysis on baseline is required. The relevant National Acts/17/ and regulations pertaining to generation of energy in India are:

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

The above mentioned National Acts and regulations pertaining to generation of energy in India 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. Thus, same is acceptable to the validation team.

Outcome of Sub-step 1b: The alternative for this project activity has been prescribed by the ACM0002. Hence, no further analysis is required for identification of alternatives.

Step 2: Investment Analysis

For the proposed project activity, the PP has demonstrated investment barrier through step 2 of “Tool for the demonstration and assessment of additionality” (version 07.0.0).

Sub-step 2a: Determine appropriate analysis method

As per “Tool for the demonstration and assessment of additionality” (version 07.0.0), for financial analysis of the project, the following three options are available:

Option I : Simple cost analysis

Option II : Investment comparison analysis

Option III : Benchmark analysis

The project will generate revenues from sale of electricity, therefore Option I is not applicable. Option II also does not apply since there is no comparable investment alternative available to the project participant. The most appropriate financial analysis method is therefore option III: the benchmark analysis, where the returns on investment in the project activity are compared to benchmark returns that are available to any investors in the country.

Sub-step 2b: Option III. Apply benchmark analysis

The investment analysis using Benchmark analysis approach (Option III) has been chosen to assess the additionality of this project activity. Further, this method illustrates the evaluation of the Project during the decision to undertake the project was taken and management approval.

Choice of Financial Indicator:

As allowed by the Methodological tool for Investment analysis (version 09.0), post tax Equity Internal Rate of Return (IRR) was selected as the financial indicator to assess the attractiveness of the project.

The PP has selected equity IRR (post-tax) as the financial indicator for the Benchmark Analysis. The appropriateness of the financial indicator has been verified by the assessment team, it was confirmed that the equity IRR is a widely accepted financial metric used by many corporations and financial institutions for investment decision-making and is a long-established benchmark for investment decisions in the Indian power sector. The PP has selected Return on equity as the benchmark which is in line with Methodological tool-Investment Analysis version 09, which is was the latest version available at the time of decision making for particular project developer. Equity IRR calculated as per default value mentioned in methodological tool for investment analysis (version 3.0) as given in table below:

Benchmark	Values	Source
Return on Equity	9.79%	Methodological tool: Investment analysis Version 09.0 https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-27-v9.0.pdf
Inflation based on CPI Combined: excluding Food and Beverages, Pan, Tobacco and Intoxicants and Fuel and Light (Median)	4.40%	https://www.rbi.org.in/Scripts/PublicationsView.aspx?id=18974
Benchmark	14.62%	

Choice of Benchmark:

As per paragraph 15 of the 'investment analysis tool' version 09.0,

"The applied benchmark shall be appropriate to the type of IRR calculated. Local commercial lending rates or WACC are appropriate benchmarks for a project IRR. Required/expected returns on equity are appropriate benchmarks for equity IRR. Benchmarks supplied by relevant national authorities are also appropriate. The DOE shall validate that the benchmarks used are applicable to the project activity and the type of IRR calculation presented."

As per the above guideline the required/expected returns on equity are appropriate benchmarks for equity IRR. In accordance with the para 20 of the Investment Analysis tool, version 09.0.

'If the benchmark is based on parameters that are standard in the market, the cost of equity should be determined either by: (a) selecting the values provided in Appendix; or by (b) calculating the cost of equity using CAPM. The default values in the Appendix A are based on long term historical returns and therefore may also be applied by projects with a start date prior to the adoption of default values by the Board.'

The project proponent has referred the latest version of investment guidelines/tool available at the time of conceptualization of particular sub-project for determination of respective "Benchmark", as described below in details.

Calculations of Default Benchmark:

Guidelines on the para 16 of the Investment Analysis tool, version 09.0 is referred for calculation of benchmark because it was the latest version of guidelines valid and available at the time of decision making.

In accordance with the paragraph 16 of the Investment Analysis tool, version 09.0 "In situations where an investment analysis is carried out in nominal terms and the available IRR benchmarks are in real terms, project participants shall convert the real term values of benchmarks 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".

As mentioned in para 6 of Appendix of the Investment Analysis tool, version 09.0, specifies default value of expected return on equity in real terms for Energy Industries (Group 1) in India = 9.79%

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

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

Where:

- Default value for Real Benchmark i.e. 9.79%
- Inflation Rate forecast by Reserve Bank of India (RBI) (i.e. Central Bank) for India

¹ As per Pg. 320 of Corporate Finance, Second Edition of Aswath Damodaran

Benchmark estimation:

para 6 of Appendix of the Investment Analysis tool, version 09.0 specifies default value of expected return on equity in real terms for Energy Industries (Group 1) in India = 9.79%

Further, long term median forecasts for growth and inflation rate forecast issued by RBI which was available during decision making = 4.40%

$$\begin{aligned}\text{Thus, Benchmark} &= \{(1+9.79\%)(1+4.4\%)\}-1 \\ &= 14.62\%\end{aligned}$$

Hence value of benchmark is arrived as 14.62%.

The data, rationales, assumptions and justifications mentioned in the VCS PD/01/ and investment analysis excel sheets/03/ were checked against the local knowledge of the validation team, sectoral scope expertise, regulatory and applicable legal requirements in the Host country India. The documents were also verified by the financial expert.

The input parameters in the financial analysis have been taken as per the values and assumptions applicable and available at the time of decision to invest in the project activity in line with Paragraph 10, investment analysis tool version 09.0 /27/.

The approach used in the VCS PD/01/ has been assessed based on a document review, whilst the following relevant documents have been reviewed:

- Board resolution for the project activity dated 07/08/2019/13/
- IRR and Benchmark Analysis calculation sheets for the project/3/
- Gujarat Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 30/08/2018/19/

During discussion with the PP, the additionality of the project activity has been discussed with representatives of the PP and finally the data, rationales, assumptions; justifications and documentation provided have been checked using local knowledge and sectoral and financial expertise of the Assessment Team, and cross checked by:

- Letter of Award/7/
- Offer letters received from the respective technology and service provider/11/

The individual financial parameters used for calculations of equity IRR of the project activity have been discussed in below section in detail;

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.

Key assumptions used for calculating post-tax Equity IRR applicable at the time of investment decision are mentioned below:

Particulars	Value	Unit	Source/Remarks
Capacity of the WTG	2.2	MW	Technical proposal received from WTG supplier at the time of decision making
Total No. of WTG	114.0	Nos.	Management Decision dated 07/08/2019
Capacity of the project	250.8	MW	Management Decision dated 07/08/2019
PLF	36.90	%	Wind Resource and Energy Assessment report by 3 rd party independent agency dated 19/07/2019
Project cost	16,030.40	INR Million	Calculated based on offer letters received at the time of decision making
Debt	70	%	GERC Tariff Order dated 30/08/2016 (Ref pg 25)
Equity	30	%	https://demo.kreatetechnologies.com/gerc/wp-content/uploads/document/07c74229-5dc4-4406-89d3-25a82fa0931b.pdf)
Interest rate	11.80	%	GERC Tariff Order dated 30/08/2016 (Ref pg 25)
Debt Repayment tenure	10	years	https://demo.kreatetechnologies.com/gerc/wp-content/uploads/document/07c74229-5dc4-4406-89d3-25a82fa0931b.pdf)
Moratorium	0	year	
Total Operation and Maintenance charges	1.70	INR Million / WTG	Proposal received from WTG Supplier and service provider at the time of decision making
Escalation in WTG O&M	4.00	%	Proposal received from WTG Supplier and service provider at the time of decision making
Escalation in by Service provider	5.00	%	Commercial Offer from Service Provider at the time of decision making
Tariff	2.85	INR/kWh	RfS document for Setting up of 1800 MW ISTS-Connected Wind Power Projects (Tranche-VIII) dated 26/06/2019
Depreciation Rate (Book)	4.75	%	Companies Act Schedule XIV
IT Depreciation Rate	7.69	%	Appendix IA of IT Rules
Income tax rate	34.94	%	Calculated
MAT rate	21.55	%	Calculated
Salvage Value	10	%	GERC Tariff Order dated 30/08/2016 (Ref pg 18)
Depreciable cost of Project	90	%	https://demo.kreatetechnologies.com/gerc/wp-content/uploads/document/07c74229-5dc4-4406-89d3-25a82fa0931b.pdf)

Particulars	Value	Unit	Source/Remarks
Working Capital			
For Fixed Charges			
O&M Charges (Month of O&M Charges)	1	Month	GERC Tariff Order dated 30/08/2018 (Ref pg 25) (https://demo.kreatetechnologies.com/gerc/wp-content/uploads/document/07c74229-5dc4-4406-89d3-25a82fa0931b.pdf)
Receivables for Debtors	2	Months	
For Variable Charges			
Interest On Working Capital	11.8%	%	
Tax Rates			
Financial Year	FY 2019-20		
Income tax rate (%)	30.00	%	Indian IT Act for FY 2019-20 (https://www.indiabudget.gov.in/finance_bill.php)
MAT (%)	18.50	%	
Surcharge (%)	12.00	%	
Health and Education cess (%)	4.00	%	
Goods and Services Tax (GST)	18.00	%	https://cbic-gst.gov.in/gst-goods-services-rates.html

Project Cost:

The Project cost for the project activity has been considered from the technical proposal received from WTG Supplier dated 16/07/2019 and commercial offer received from service provider (responsible for installation of transmission infrastructure, land identification and aggregation, security infrastructure, store development, development of civil infrastructure etc.) dated at the time of decision making. The project cost includes cost of materials and equipment, labour and services, identification, selection and allocation of land, cost for obtaining all government permissions and infrastructure development charges. Considering all the charges, project cost is coming out INR 16,030.40 Million. Validation team has checked all the offer letters available at the time of decision making and found to be appropriate and it is accepted.

Further, Project Proponent has very recently won this project under competitive reverse bidding process conducted by Solar Energy Corporation of India Ltd., Govt. of India. Presently, project proponent has just initiated the land identification, micro-setting and project construction planning. Thus, actual cost of the project is not available at the validation stage. Thus, the variation is well covered in sensitivity analysis considering +/- 10% variation in the project cost and results are summarized in this report.

Operation and Maintenance Cost and its escalation:

To estimate the project return (IRR), PP has considered the operation and maintenance cost of INR 1.7 Million/WTG per year with 3 years of free O&M period and subsequently 4% escalation every year for WTG supplier. Further, PP has considered O&M cost of INR 0.43 Million/WTG per year with 5% escalation from 2nd year onward from service provider. These costs were available at the time of decision making of the project. The appropriateness of same has been checked with the offer letters received from the respective parties and found to be consistent and it is accepted.

Plant Load Factor:

The Plant Load Factor is considered as indicated in the above table as per the third-party assessment report. In this project, PP has considered 36.9% PLF to calculate the project return inline with third-party assessment report. This is found to be in line with paragraph 3 (b) of Annex 11 of EB 48 and it is accepted. To further crosscheck appropriateness of PLF considered for the project activity, GERC tariff order dated 30/08/2016 is checked which is the latest available document at the time of decision making and on page 16 of the order indicates PLF of 24.5% for new wind power project in Gujarat. Thus, it is concluded that project specific PLF considered by the PP is appropriate and conservative; and the same has been considered in IRR calculations for the project activity. This is found to be appropriate and it is accepted. Also, this parameter is considered under +/-10% sensitivity.

Electricity Tariff:

PP has owned this project by competitive reverse bidding process by SECI, Govt. of India. Thus, at the time of decision making, PP has considered the ceiling tariff (highest tariff) to analyse the project additionality. Thus, according to the RfS document for Setting up of 1800 MW ISTS-Connected Wind Power Projects (Tranche-VIII) dated 26/06/2019, ceiling tariff for this project was INR 2.85/kWh. Further, after competitive reverse bidding process, PP has won the project at INR 2.83/kWh.

The Project participant had considered the tariff rate specific to this project in line with the data available at the time of decision making (as indicated in the above table), the electricity tariff fixed for 25 years of project's lifetime. Since the source documents referred for, tariff rate was the latest available and applicable documents at the time of conceptualization of the project activity, paragraph 10 of investment analysis tool version 09.0 is followed and it is accepted. Thus, it is concluded that electricity tariff considered for the project activity is found to be appropriate and it is accepted.

Debt to Equity Ratio:

The project activity is funded by 30% equity and 70% debt. This is in line with the Paragraph 10, investment analysis tool version 09.0, which talks about typical debt/equity finance structure in the sector in the country. Typical debt-equity ratio is 70:30 in wind energy sector and this is checked from GERC tariff order dated 30/08/2016/29/ which is latest available at the time of investment decision.

Life Time of project activity:

The lifetime of the project activity is 25 years which has been considered from the GERC tariff order dated 30/08/2016 /29/. This is consistent with the lifetime of wind power projects and has been confirmed by the technical expert. The crediting period of the proposed project activity is 10 years (renewable) as mentioned in the joint VCS PD/01/. However, the period of assessment considered for the investment analysis is 25 years. This has been confirmed from the IRR-benchmark spread sheet submitted by the PP. Hence the considered assessment period of 25 years meets the requirement of paragraph 6 of investment analysis tool version 09.0.

Interest rate on term loan:

PP has considered 11.8% rate of interest rate for this project activity. The interest on term loan considered for the investment analysis as per GERC tariff order dated 30/08/2016 /29/. This was available to the PP at the time of the investment decision. Hence the considered rate is appropriate and in line with applicable guidance in paragraph 10 of investment analysis tool version 09.0.

Loan tenure, Repayment period and Moratorium period:

The PP has considered loan tenure and debt repayment period as 10 years, with no moratorium period of as per the GERC tariff order; dated 30/08/2016 /29/. The considered repayment schedule was available to the PP at the time of investment decision and hence found to be acceptable.

Book Depreciation Rate and Income Tax Depreciation Rate:

The Depreciation on plant and machinery is calculated at 4.75% as per the Straight Line Method (SLM) as per the Companies Act, Schedule XIV, Item II (i) (a) published by the Government of India/23/. Furthermore, the PP has considered 10% as salvage value and 90% as depreciable component on plant and machinery as per publicly available source (GERC tariff order, dated 30/08/2016 and Schedule XIV, The Companies Act 1956/22/), which is found justified. The income tax depreciation rate of 7.69% has been considered as per the Income Tax, depreciation rates for power generating units published by the Government of India.

(Source: <https://www.incometaxindia.gov.in/charts%20%20tables/depreciation%20rates.htm>)

As the Income tax India website is official data, it eliminates any ambiguity that there could have been in this regard. Thus, same are acceptable to the assessment team.

Income Tax and MAT:

PP has considered Income Tax as 34.94% (inclusive of Surcharge 12%, Health & Education Cess 4%) and MAT 18.50% respectively (Including surcharge and education cess) in investment analysis for the project activity and values are sourced from dept. of Income Tax, Govt. of India. This is as per tax rates applicable to a domestic company in India. The appropriateness of the same has been checked and confirmed by financial expert involved in the project activity. As the Income tax India website is official data, it eliminates any ambiguity that there could have been in this regard. Thus, same are acceptable to the assessment team.

Residual (Salvage) Value:

Salvage value is considered as 10% of the total project cost (excluding cost of land lease, erection and commissioning charges as well as transportation charges) as per the GERC tariff order, dated 30/08/2016. These have been added back to the cash flow. As the land is purchase and it is being non-depreciable item, it is added back to the cash flow. However, PP considered 10% of cost of plant and machinery and 100% land cost as residual (salvage) value for the project activity conservatively). This is further validated as per the accounting practises and same has been also cross checked from Section 205 (2b and c) of Companies Act 1956 on the publically available web-link (<http://www.indiankanoon.org/doc/1422372/>) which allows a depreciable cost of ninety five per cent which implies a consideration of 5% of salvage value as a standard accounting practice. Thus, the consideration by the PP of 10% salvage value is conservative and hence appropriate for the purpose. The appropriateness of this is confirmed by the financial expert involved in the project activity; thus, it is accepted.

Conclusion:

The values considered for all the above discussed parameters were available at the time of investment decision and hence are valid and applicable to the project activity. All input values have been be consistently mentioned and applied in all calculations. This meets the requirement of paragraph 10 of investment analysis tool version 09.0. The assessment team confirms that in the calculation of equity IRR only the portion of investment costs which is financed by equity has been considered as the net cash outflow and the portion of the investment costs which is financed by debt has not been considered a cash outflow. This meets the requirement of paragraph 14 of investment analysis tool version 09.0. Based on the above parameters, the post-tax Equity IRR for the each sub-project of the project activity is calculated.

Organization Name	Equity IRR without Carbon Revenue	Benchmark (Equity IRR)
CLP India Pvt. Ltd.	9.08 %	14.62 %

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. Based on result of IRR excel spreadsheets, equity IRR is less than Benchmark. This substantiates that the investments are not financially attractive (Equity IRR for the project activity is less than the Benchmark). Thus, it can be easily concluded that project activities are additional & is not business as usual scenario.

Sub-step 2d: Sensitivity Analysis

Addressing Guidance 27 of Tool 27, Investment Analysis, only variables, including the initial investment cost, that constitutes more than 20% of either total project costs or total project revenues should be subjected to reasonable variation and the results of this variation should be presented in the PD and be reproducible in the associated spreadsheets. Guidance also states, "All parameters varied need not necessarily be subjected to both negative and positive variations of the same magnitude". The Annex also states, as a general point of departure, variations in the sensitivity analysis should at least cover a range of +10% and –10%, unless this is not deemed appropriate in the context of the specific project circumstances.

The tariff has already determined after competitive reverse bidding which is fixed for entire life of the project and hence it need not be subjected to variation. All other expenses are much less than 20% of the total cost. Hence, only generation needs to be subjected to reasonable variation. Nevertheless, following factors have been considered in to sensitivity analysis:

- Plant Load Factor
- Electricity Tariff
- Project Cost
- O&M Cost

The rationale of sensitivity is, "The ultimate objective of the sensitivity analysis is to determine the likelihood of the occurrence of a scenario other than the scenario presented, in order to provide a cross-check on the suitability of the assumptions used in the development of the investment analysis." The results of sensitivity analysis show that even with a variation of +10% & -10% in project cost, O&M cost, PLF and Tariff Rate, Equity IRR is significantly lower than the benchmark and it is evident from the results given above; the project remains additional even under the most favourable conditions.

Variation %	-10%	0%	10%	Variation required to breach benchmark
Electricity Tariff	6.79%	9.08%	11.42%	23.20%
Plant Load Factor	6.79%	9.08%	11.42%	23.20%
Project Cost	11.56%	9.08%	7.13%	-19.42%
O&M Cost	9.40%	9.08%	8.76%	-195.50%

To evaluate the additionality of the project, electricity tariff structure is sourced from ceiling (maximum) tariff mentioned in "RfS document for Setting up of 1800 MW ISTS-Connected Wind Power Projects (Tranche-VIII) dated 26/06/2019" for tariff based competitive bidding process". According to this selection document, Solar Energy Corporation of India (SECI) considered the levelized tariff of INR 2.85 as the ceiling tariff for prospective bidders who willing to participate in the selection process. Since the tariff is fixed for a period of 25 years, i.e. lifetime of the project, revenue generation is also fixed for the entire lifetime of the project and considering this tariff rate, equity IRR is coming out 9.08%. Thus, considering this tariff rate, in any scenario, equity IRR would not cross the benchmark. Further, sensitivity analysis of +10% to -10% have been conducted and in both the cases equity IRR is less than the benchmark. Sensitivity analysis shows that project would cross the benchmark if electricity tariff increased by 23.20% which is not possible in as tariff rate is already fixed by competitive bidding process for the entire life time of the project.

However, after competitive bidding, 250.8 MW project was awarded to CLP India Pvt. Ltd. and Letter of Award (LOA) has been issued at the tariff rate of INR 2.83 per unit which would be fixed for a period of 25 years. Considering this tariff, equity IRR is coming out 8.92%. Thus, the financial indicator crossing the benchmark could be ruled out.

- The plant load factor (PLF) affects the equity IRR of the project activity as increase in the PLF would leads to an increase in export of electricity and the revenues associated with the project

activity. For this project, 36.90% PLF has been considered to demonstrate the additionality of the project in line with the 3rd party PLF assessment report. Further, sensitivity analysis of +10% to -10% have been conducted and in both the cases equity IRR is less than the benchmark. Sensitivity analysis shows that project would cross the benchmark, if in any favorable scenario, PLF increased by 23.20%.

- To assess the additionality, project cost has been considered from the offer letters submitted by the respective service providers and WTG supplier. According to the same, project cost is worked out INR 16,030.40 million. Further, negotiations with the respective service providers and WTG supplier are ongoing. Thus, actual project cost is not available at this point of time. Thus, sensitivity analysis of +10% to -10% have been conducted and in both the cases equity IRRs are less than the benchmark. If the project cost decreased by 19.42%, then equity IRR would cross the benchmark.
- The O&M costs associated with the project has a major impact on the financial returns of the project. Two major suppliers are involved in this project, viz. the WTG supplier (responsible for installation and operation of WTGs) and service provider (responsible for other major activities like land identification and development and other civil construction and maintenance etc.). To assess the additionality of this project, total O&M cost was considered inline with the offer letters submitted by the respective service providers and WTG supplier with yearly escalation. Considering the same, equity IRR is coming out 9.08%. Thus, actual O&M costs are not available at this point of time. Thus, sensitivity analysis of +10% to -10% have been conducted and in both the cases equity IRRs are less than the benchmark. Thus, financial analysis predicts that if the O&M cost decrease by 195.5%, then only project would be financially viable. Further, decrease of O&M cost more than 100% is not possible. Thus, in any scenario project will not breach the benchmark return.

The sensitivity analysis shows that there is unlikely any case in which the variation of a parameter can make the equity IRR without VCS reach the benchmark.

In view of the above discussion the assessment team has concluded that the project activity is additional and it is found to be financially not viable.

Outcome of Step 2:

In view of the above discussion the assessment team has concluded that the project activity is additional and it is found to be financially not viable.

Step 3: Barrier analysis

Barrier analysis has not been used.

Step 4: Common practice analysis

PP has demonstrated common practice analysis as per “Common practice tool” version 03.1. The stepwise approach to validate common practice analysis for the project activity is discussed as below;

As per paragraph 13 of “Tool for the demonstration and assessment of additionality” – Version 7.0.0, project activity belong to measure “Switch of technology with or without change of energy

source including energy efficiency improvement as well as use of renewable energies”; hence sub-step 4a) of the tool is applicable for the project activity.

Common practice analysis has been carried out as per Methodological tool “Common Practice”, version 03.1 EB84, Annex 7”. In the context of the project activity, the following parameters are defined as per Part I. Definitions of the Guidelines on Common Practice:

1. Applicable Geographical Area (Para 9): The host country, i.e. India has been considered as the applicable geographical area for this project.

The PP has submitted the excel spread sheet of common practise analysis as per steps below for projects identification for similar and different projects and found to be appropriate.

2. Measure (Para 10): The project activity reduces greenhouse gas emissions by generating electricity using renewable energy source. 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 common practice analysis is carried out as per Stepwise approach for common practice. Stepwise approach for common practice 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%	376.2	MW
Capacity of the proposed project activity	250.8	MW
-50%	125.4	MW

The capacity of the project activity is 250.8 MW; hence applicable output range is 125.4 MW to 376.2 MW.

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

- The projects are located in the applicable geographical area;

- The projects apply the same measure as the proposed project activity;
- The projects use the same energy source/fuel and feedstock as the proposed project activity, if a technology switch measure is implemented by the proposed project activity;
- The plants in which the projects are implemented produce goods or services with comparable quality, properties and applications areas (e.g. clinker) as the proposed project plant;
- The capacity or output of the projects is within the applicable capacity or output range calculated in Step 1;
- The projects started commercial operation before the project design document (CDM-PDD) is published for global stakeholder consultation or before the start date of proposed project activity, whichever is earlier for the proposed project activity.

Identification of the similar projects (CDM and non-CDM) is carried out as per sub-steps of Step (2) as follows:

- As the projects are located in India, therefore, the applicable geographical area is India and projects in the host country India have been chosen for analysis.
- 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, all projects applying same measure (b) as the proposed project activity are candidates for similar projects
- The energy source used by the project activity is Wind. Hence, only wind energy projects have been considered for analysis
- The project activity produces electricity; therefore, all power plants that produce electricity are candidates for similar projects
- The capacity range of the projects is within the applicable capacity range from 125.4 MW to 376.2 MW
- As this is the futuristic project and the project expected to be commissioned on 01/06/2021. As Kyoto Protocol was ratified by India on 26/08/2002², therefore projects, which had started commercial operation between 26/08/2002 to till date, have been identified.

PP had considered 14 wind power generation projects in applicable geo-graphical area in applicable output range of +/-50% of the total design capacity of 250.8 MW i.e. output range of 125.4 MW to 376.2 MW. The assessment team has checked and confirmed that all these 14 projects have started their commercial operation till now. This data has been sourced from official website of Bloomberg NEF, UNFCCC & VERRA and found to be appropriate, thus it is accepted.

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} .

² http://unfccc.int/kyoto_protocol/status_of_ratification/items/2613.php

All the projects identified in step-2 are either registered or project activities submitted for registration, or project activities undergoing validation in CDM /VCS scheme or informed UNFCCC about the intension to avail carbon benefit.

Thus $N_{all} = 0$

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} .

From the projects identified above, those projects which employ “**different technologies**” have been excluded and the number of such projects has been identified as N_{diff} .

As $N_{all} = 0$; thus $N_{diff} = 0$

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

As N_{all} is zero thus, $N_{all} - N_{diff} = 0$; is less than 3

Outcome of Step 5:

As,

- i. $F = \text{Not defined}$
- ii. $N_{all} - N_{diff} = 0$; is less than 3

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

Thus assessment team had concluded that the project activity is not a common practice in the host country India, as F is less than 0.2(not defined) and $N_{all} - N_{diff}$ is lesser than 3. This is found to be appropriate and it is accepted.

The above discussions show that this project development is not a common practice and the project activity is not financially attractive; hence the project activity is additional.

Based on detailed assessment and documents review, assessment team confirmed that the input parameters in the financial analysis have been taken as per the values and assumptions applicable and available at the time of decision to invest in the project activity in line with methodological tool “Common Practice” version 03 /21/.

The approach used in the VCS PD /01/ has been assessed based on a document review, whilst the following relevant documents have been reviewed:

- Equity IRR and Benchmark Analysis calculation sheets/3/
- Gujarat Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 20016 /29/

During telephonic discussion, the additionality of the project activity has been discussed with representatives of the PP and finally the data, rationales, assumptions; justifications and documentation provided have been checked using local knowledge and sectoral and financial expertise of the Assessment Team, and cross checked all relevant documents.

Conclusion:

The assessment team is able to confirm that:

- The project analysis complies with requirements of the latest version of VVS.
- All the parameters and assumptions used in the investment analysis have been assessed thoroughly and found appropriate. The information with regard to how the input values was validated, cross-checked is included under relevant parameter.
- The sources used have been reviewed by the assessment team found to be authentic as referenced under relevant parameter.
- The benchmark was found suitable and has been thoroughly explained in detail.
- All the assumptions and calculations for investment analysis area have been checked by the financial expert and technical expert and found to be correct and reasonable.
- The financial returns from the project activity are insufficient to meet the required investment against the selected benchmark under reasonable variations (sensitivity) conducted on key parameters.
- The project activity complies with the latest version of “Tool for demonstration and assessment of additionality” and “Investment Analysis Tool (version 09, Annex-11 of EB 101)”.

3.2.6 Quantification of GHG Emission Reductions and Removals

The proposed project activity has applied baseline methodology as mentioned in the methodology ACM0002 version 19.0.0. As per the paragraph 42 of the methodology:

“Baseline emissions include only CO₂ emissions from electricity generation in power plants that are displaced due to the project activity. The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid-connected power plants and the addition of new grid-connected power plants”.

The baseline emissions are to be calculated as follows:

$$BE_y = EG_{PJ,y} \times EF_{grid, CM, y} \dots\dots\dots(1)$$

Where:

BE_y = Baseline emissions in year y (t CO₂)

$EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh)

$EG_{PJ,y} = EG_{PJ, facility, y}$ (for Greenfield projects paragraph 44 ACM0002)

$EF_{grid, CM, y}$ = Combined margin CO₂ emission factor for grid connected power generation in year y calculated using the latest version of the “Tool to calculate the emission factor for an electricity system” (t CO₂/MWh)

The Project proponent has adopted the combined margin approach for determination of the grid emission factor as per Tool to calculate the emission factor of an electricity system’ Version 7.0. The PP opted for combined margin emission factor ($EF_{grid, CM, y}$) for the project activity and it has been estimated ex-ante as 0.93684 tCO₂/MWh (National electricity grid in India). It will remain fixed throughout the crediting period for the project activity as opted by PP. The combined margin emission factor is obtained from the three years generation weighed average of the operating margin emission factor and the latest year build margin emission factors by applying suitable weights (i.e. 75% to operating margin emission factor ($EF_{grid, OM, y}$) and 25% to build margin emission factor ($EF_{grid, BM, y}$) as referred to the EF tool version 7.0.

The weighted operating margin value of 0.9610 tCO₂/MWh and build margin value of 0.8644 tCO₂/MWh for Indian electricity grid have been referred from CO₂ baseline database published by Central Electricity Authority, Govt. Of India, version 14 dated December 2018/14/. This is the latest available CO₂ baseline database at the time of the revised VCS PD submission for validation of the project activity. This is found to be appropriate and it is accepted.

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

The PP has considered the value of $EG_{PJ, y}$ as 810,695.95 MWh/year for the project activity, which is an annualized average value calculated ex-ante based on the estimated generation available at the time of investment decision. Thus, the estimated annual average of emission reductions is arrived as 759,489 tCO₂e and total 7,594,890 tCO₂e over the 10 years of crediting period. The validation team confirms that the estimates of baseline emissions can be replicated using the information provided in the final VCS PD /1/. It can also be verified using the emission reduction calculation spread sheet/02/. Hence, it is concluded that the approach to calculate emission reductions is clearly demonstrated in the VCS PD /01/ is appropriate.

Baseline emissions as per the equation (1) above:

$$BE_y = 810,696 \text{ MWh} \times 0.9368 \text{ tCO}_2/\text{MWh}$$

$$BE_y = 759,489 \text{ tCO}_2$$

Estimation of Project Emissions (PE_y):

As per paragraph 34 of the applied methodology, for most renewable power generation project activities, PE_y = 0. However, some project activities may involve project emissions that can be significant. These emissions shall be accounted for, by using the following equation:

$$PE_y = PE_{EF, y} + PE_{GP, y} + PE_{HP, y}$$

Where,

PE_y = Project emissions in year y (tCO₂e)

PE_{FF, y} = Project emissions from fossil fuel consumption in year y (tCO₂)

PE_{GP, y} = Project emissions from the operation of geothermal power plants due to the release of non-condensable gases in year y (tCO₂e)

PE_{HP, y} = Project emissions from reservoirs of hydro power plants in year y (tCO₂e)

As per para 37 of ACM0002 version 19,

“For all renewable energy power generation project activities, emissions due to the use of fossil fuels for the backup generator can be neglected”

Proposed project activity is wind power project; hence the project emissions are not applicable to the project activity. Hence, PE_y = 0

Estimation of Leakage Emissions (LE_y):

As per the paragraph 56 of ACM0002 version 19.0, No other leakage emissions are considered, The main emission potentially giving rise to leakage in the context of electrical sector projects is emission arising due to activities arising such as power plant construction and upstream emission

from fossil fuel use (e.g. extraction, processing, and transport). These emission sources are neglected. ($LE_y = 0$).

Estimation of GHG emission reductions:

Emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y,$$

Where

ER_y = Emission reductions in year y (tCO_2)

BE_y = Baseline Emissions in year y (tCO_2)

PE_y = Leakage emissions in year y (tCO_2)

This is the annualized average value calculated for ex-ante representation purposes. The year-wise ER value has been demonstrated under the section 3.4 of the VCS PD, which is found to be acceptable.

Conclusion:

In line with the paragraph 113 of VVS for PAs version 02.0, validation team confirms that the project activity complies with the specified requirements of algorithms and/or formulae used to determine emission reductions and discussed above. The assessment team also confirms that:

- All assumptions and data used by the project participants are listed in the VCS PD, including their references and sources;
- All documentation used by project participants as the basis for assumptions and source of data is correctly quoted and interpreted in the VCS PD;
- All values used in the VCS PD are considered reasonable in the context of the proposed project activity;
- The baseline methodology and corresponding tool(s) have been applied correctly to calculate project emissions, leakage emissions, baseline emissions and emission reductions;
- All estimates of the baseline emissions can be replicated using the data and parameter values provided in the VCS PD.

3.2.7 Methodology Deviations

No methodology deviations identified.

3.2.8 Monitoring Plan

According to the applied methodology, ACM0002, version 19.0, the only parameter to be monitored is the “Quantity of net electricity generation supplied by the project plant/unit to the grid in year y ”. This parameter is directly monitored through the dedicated metering system installed at the switch yard located at project site.

The monitoring methodology specified in the methodology requires that the project-monitoring plan to consist of monitoring of quantity of net electricity supplied to the grid in the year y. In order to monitor the mitigation of GHG due to the project activity, the total energy exported needs to be measured. The net energy supplied to grid by the project activity multiplied by emission factor for regional grid, would form the baseline for the project activity. Since the baseline emission factor is based on an ex-ante determination, monitoring of this parameter is not required. The sole parameter for monitoring is the net electricity exported to the grid.

Gamesa is the O&M contractor for this wind project. Further, all the companies will be responsible for maintaining respective monitoring data in respect of the project activity.

This approved monitoring methodology requires monitoring of the following:

Net electricity supplied from the project activity: While Emission factor of the project activity is fixed ex ante hence no further monitoring of this parameter is required. As per ACM0002 leakage need not be considered hence leakage has not been considered for the project activity. Hence, the sole parameter for monitoring is the net electricity supplied by the project activity to the grid.

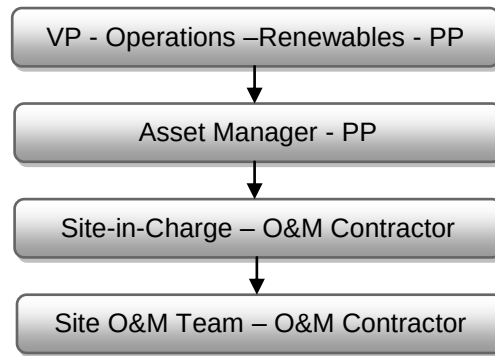
The Project activity is operated and managed by CLP India Pvt. Ltd. CLP follow the documentation practices to ensure the reliability and availability of the data for all the activities as required from the identification of the site, resource assessment, logistics, finance, construction, commissioning and operation of the wind power project.

Monitoring roles and responsibilities

The operational and management structure implemented for data monitoring is as follows:

The monitoring plan is developed in accordance with the modalities and procedures for VCS project activities and is proposed for grid-connected wind power project being implemented in Gujarat, India. The monitoring plan, which will be implemented by CLP describes about the monitoring organisation, parameters to be monitored, monitoring practices, quality assurance, quality control procedures, data storage and archiving.

The authority and responsibility for registration, monitoring, measurement, reporting and reviewing of the data rests with the respective project proponent. CLP has proposed the following structure for data monitoring, collection, data archiving and calibration of equipment's for this project activity. The Project activity is operated and managed by the CLP. CLP would follow the documentation practices to ensure the reliability and availability of the data for all the activities as required from the identification of the site, resource assessment, logistics, finance, construction, commissioning and operation of the wind power project. The data for the project is compiled and subsequently stored by the PP. The roles and responsibilities for the project are described as below;



The responsibilities of the team members comprise of the following members:

Responsibilities of VP – Operation:

- Overall supervision of the project and to meet yearly generation targets

Responsibilities of Asset Manager:

- Overall functioning and maintenance of the project activity and overall responsibility of compliance with the CDM Monitoring Plan.

Responsibilities of Shift In-charge:

- Responsible for maintaining the data records, ensures completeness of data, and reliability of data.
- Regularly verifying the monthly energy generation date with energy sales receipt or installed meters reading for identification of any discrepancies in data collection and taking suitable action to rectify them

Responsibilities of O&M Team:

- Responsible for day to day data collection and maintains day to day log book for monitored data
- Responsible for monthly and annual report generation and quality assurance of the data/reports and preliminary check of data for any discrepancies.

Data Recording

The state utility and representative of CLP shall jointly read the metering system every month at the delivery point.

Meter readings taken jointly will be signed by the representatives of state utility and CLP. If CLP's representative would not present for joint meter reading then the meter reading would taken by state utility shall be considered as final; provided a signed copy of the meter reading is sent to the Power Purchase / Developer within twenty four (24) hours of such reading of the main metering system or back up metering system as the case may be.

CLP would install main meter and check meter of static type 0.2s class accuracy of ABT Meters at the Interconnection Point as per the norms specified in the Metering Code by CEA. The main meter and check meter shall consist of a pair of export and import parameters with facility for recording meter readings using meter recording instrument.

Calibration Frequency

The main and check and standby meters shall be calibrated once in a five year in line with notification issued by Central Electricity Authority, Govt of India dated the 17th March, 2006 (https://www.aegcl.co.in/Metering_Regulations_Of_CEA_17_03_2006.pdf) . The meters would be tested by any accredited laboratory in the presence of the parties (State Electricity Board, Project investor and the O&M Contractor) involved. Both parties shall seal main and backup meters. Defective meters shall be replaced immediately. As per the schedule, calibration of all energy meter, instruments and equipment will be carried out once in five year and recorded in calibration reports.

All the meters have installed shall be jointly inspected and sealed and shall not be interfered with, tested or checked except in the presence of representatives of both parties. The meter readings of the main meter shall form the basis of billing. If any of the meters installed at interconnection point are found to be registering inaccurately the affected meter shall be replaced immediately.

During meter test check of the main meter and check meter indicates an error in the main meter beyond the permissible limits of error provided in the relevant standards (as defined in the Central Electricity Authority (Installation and Operation of Meters) Regulations, 2006, but no such error is indicated in the corresponding check meter, billing for the month shall be done on the basis of the reading of the check meter and the main meter shall be replaced immediately. If main meter and check meter indicate an error beyond the limits, billing for the month shall form the basis of the readings of the standby meter, and the main meter and the check meter shall be replaced immediately.

Emergency Preparedness

In case of any abrupt breakdown, the fault will be immediately identified by the O&M personnel. All minor faults shall be taken care of by the O& M personnel, In case of any major faults, the grid personnel will be informed and replacement of the equipment shall be made within 24 hours.

Sample apportioning procedure for Data Adjustment in case of monitoring period different from billing period:

In case the dates of a particular monitoring period do not match with the dates of the billing period, the net electricity exported to the grid would be calculated as follows:

$$D = (A/B)*C$$

A = Difference of number of days which are not matching of billing period and monitoring period.

B = Number of days of the billing period/ month which was not matched with the monitoring period.

C = Net Electricity supplied to the grid for that given billing period/ month

The calculated value after apportioning would be used for calculation of emission reductions during that period.

During the assessment and discussion with PP, it was observed that, the project activity is connected to the grid through an appropriate power evacuation system. Appropriate metering system and calculation procedures are transparently described in the monitoring plan to enable accurate determination of emission reductions achieved by the project activity.

Conclusion:

The monitoring methodology applies consistently the choice of the option selected for monitoring of baseline emissions. The monitoring plan provide procedures for the collection and archiving of all relevant data necessary for estimation or measuring the emission reductions within the project boundary during the crediting period.

The project participant has the ability to implement the monitoring plan. This is checked through discussion with consultant, the project participant and O&M contractors of the project activity during the physical site inspection. The staffs at the sub-station and the representative of the technology providers were also interviewed to verify the accuracy in the documents. This has been checked during the site visit and is found to be acceptable.

The final VCS PD /01/ has been reviewed to check that the procedure for data uncertainty, emergency preparedness, roles and responsibility, operational and management structure are mention in the PD. The monitoring plan completely describes all measures to be implemented for monitoring all parameters required. Based on the above discussion and the requirements of paragraphs 117 and 119 of the VVS for PAs version 02.0/9/, the validation team confirm that:

- The monitoring plan included in the VCS PD is based on the baseline methodology ACM0002 version 19.0.0 which has been applied to the proposed VCS project activity
- The monitoring arrangements described in the monitoring plan are feasible within the project design and inline with methodology monitoring plan. No conformity found by the validation team.
- The PP has the ability to implement the monitoring plan as per the VCS PD.

3.3 Non-Permanence Risk Analysis

The project activity does not require a non-permanence risk analysis. Hence this is not applicable.

4 SAFEGUARDS

4.1 No Net Harm

There is no negative impact to any socio economic conditions of the region due to the project activity. As per the notifications issued by Ministry of Environment and Forest dated 01/12/2009 (ref: <http://moef.nic.in/downloads/rules-and-regulations/3067.pdf>), Environmental Impact Assessment for the wind projects is not required to be done.

This project activity will not involve any negative environmental or socio-economic impacts, as the project activity involves generation of power using wind energy which is a clean source of energy. Hence no mitigation measures are required.

4.2 Environmental Impact

The project proponent has mentioned in the VCS PD/01/ that the present project activity does not require EIA to be carried out because as per the schedule 1 of Ministry of Environment and Forest notification dated 14/09/2006/28/ <http://envfor.nic.in/legis/eia/so1533.pdf> and further notification number 3067 from MoEF dated 01/12/2009 <http://moef.nic.in/downloads/rules-and-regulations/3067.pdf>, activities are required to undertake environmental impact assessment studies. The proposed project activity does not fall under the listed categories and hence not required an EIA to be done. Thus, the adequacy of the analysis carried out by the project participant for the impact of the implementation of the project activity on the environment has been validated as per paragraphs 126 and 129 of VVS for PAs version 02.0.

The validation team is of the opinion that the project complies with environmental regulations in India

4.3 Local Stakeholder Consultation

The local stakeholder consultation process has been described in detail, by the PP, in section 5.3 of the VCS PD the project participant identified the relevant stakeholders such as local villagers, local employee, representatives of affected people residing in the project area and local village head etc.

Local stakeholder consultation process has been performed during the design phase through inviting the relevant stakeholders to comment on the project activity. The Local Stakeholder Meeting was held on 23/09/2019 at the project site office.

Stakeholders were invited through open public notice and invitation letter. The documentary evidence provided as proof of date of the invitation, meeting; and mode of invitation/8/ has been checked by the assessment team during the site visit and found to be appropriate.

After sharing information with the local stakeholders about the company and the purpose of proposed activity, the stakeholders were briefed about non-conventional energy sources and their importance. The PP also informed the stakeholders about their intention of securing carbon credit benefits for the project activity for financial sustainability of the project. The Minutes of the meeting of the stakeholder meeting and attendance sheet/8/ have been submitted by the PP.

During the site visit the assessment team interviewed some of the local villagers. Based on the replies of the villagers, the validation team was convinced that the process of stakeholder consultation was carried out as described in the VCS PD. The villagers also confirmed that they were invited for the meeting through public notice. This was found to be consistent with the invitation process mentioned in the VCS PD/01/.

Overall, there was an understanding among the stakeholders that the proposed project activity would lead to the overall development of the area, mainly by generating employment opportunities and improving the infrastructure leading to an improved life for the villagers. The local stakeholders interviewed during the site visit endorsed this view.

4.4 Public Comments

In accordance with the requirement in clause 3.17.5 of the VCS standard version 3.7 “All VCS projects are subject to a 30-day public comment period. The date on which the project is listed on the project pipeline marks the beginning of the project’s 30-day public comment period”. The PP listed their project activity in the VCS pipeline for 30 days from 28/10/2019 to 27/11/2019 (https://www.vcsprojectdatabase.org/#/pipeline_details/PL1968) for public comments.

No comments received during the commenting period, as evident from the VCS pipeline in the web interface.

5 VALIDATION CONCLUSION

M/s. CLP India Private Limited has contracted the LGAI Technological Center, S.A. (Applus+ Certification) to validate the project: “Grid Connected Wind Energy Project in Gujarat” with regard to VCS Version 3 requirements and the information provided by the project proponent related to the project design, operation, monitoring and reporting.

A risk-based approach has been followed to perform this validation and verification. In the course of the joint validation & verification 06 Corrective Action Requests (CARs), 01 Clarification requests (CLs) 01 Forward Action Request (FAR) were raised and successfully closed.

No limitations or doubts were identified related to the validation and verification.

Validation conclusion:

Applus+ Certification has reviewed the project description documents and subsequently carried out site visit interviews to confirm the fulfilment of stated criteria.

The purpose of this project activity is to generate electricity using renewable sources (wind) and export it to Indian national grid, thereby displacing the grid generated electricity.

The project activity has applied the baseline and monitoring methodology, ACM0002: Grid-connected electricity generation from renewable sources, Version 19.0.0, which is an approved methodology under the CDM programme and is acceptable under VCS Version 3. The baseline has been determined in accordance with the stated approved baseline methodology.

As summary the validation team able to conclude that:

- The project is in line with all relevant host country criteria (India) and all relevant VCS version 3 program guidelines requirements.
- The project additionality is sufficiently justified in the VCS PD.
- The monitoring plan is transparent and adequate and in line with applied baseline and monitoring methodology of ACM0002, version 19.0.
- The calculation of the project emission reductions is carried out in a transparent and conservative manner, so that the calculated emission reductions of 7,594,890 tCO₂e/year is most likely to be achieved during the 10 years (renewable) of crediting period.
- The conclusions of this report show, that the project, as it was described in the project documentation, is in line with all criteria applicable for the validation as outlined under VCS version 3.

APPENDIX 1: Document Reference

Ref. No	Title of Document	Version	Date
1	Project description	1.0	02/10/2019
		2.0	01/12/2019
2	Emission Reductions Calculation Spread sheet (Validation)	01	07/11/2019
3	Combined IRR and Benchmark Analysis Spread sheet	01	22/09/2019
4	ACM0002, "Grid-connected electricity generation from renewable sources"	19.0	-
5	Tool to calculate the emission factor for an electricity system	07.0	EB 100 Annex 4
6	VCS pipeline https://www.vcsprojectdatabase.org/#/pipeline_details/P1968	-	-
7	Letter of Award (LoA) for the project activity in the name of CLP India Private Limited issued by Solar Energy Corporation of India Ltd. (SECI), Govt. of India	-	28/09/2019
8	Local stakeholder documents – • Public notice • Minutes of meeting • Attendance sheet • Comments sheet	-	23/09/2019
9	Clean Development Mechanism Validation and Verification Standard	02.0	29/11/2018
10	Tool for the demonstration and assessment of additionality	07.0.0	EB 70, Annex 8
11	Technical specifications of the project	-	-
12	Approvals and Clearances for project activity	-	-
13	Management Decision dated 07/08/2019	-	-
14	CO ₂ baseline database published (in Dec 2018) by Central Electricity Authority, Govt. Of India	14	December 2018
15	Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations	-	29/04/2016
16	Income Tax Act 1961 (Source: Appendix IA of Income Tax Rules) http://taxguru.in/company-law/rates-of-depreciation-under-the-companies-act-as-mentioned-in-schedule-xiv.html	-	-
17	IT depreciation rate http://www.incometaxindia.gov.in/charts%20%20tables/depreciation%20rates.htm	-	-
18	Income tax rate and Minimum Alternate Tax (MAT) rate http://indiabudget.nic.in/ub2008-09/fb/bill81.pdf http://www.incometaxindiapr.gov.in/incometaxindiapr/content/taxrates/taxrates_2008_09_cos.htm	-	-

Ref. No	Title of Document	Version	Date
	Service tax rate: http://indiabudget.nic.in/ub2007-08/fb/bill5.pdf Surcharge and Education cess: http://indiabudget.nic.in/ub2008-09/fb/bill81.pdf http://indiabudget.nic.in/ub2008-09/fb/bill2.pdf		
19	Inflation forecast (CPI Combined Median) as per RBI for 5yrs https://rbi.org.in/Scripts/PublicationsView.aspx?id=16402	-	03/06/2015
20	Detailed procedure on REC mechanism dated 01/06/2010 by Central Electricity Regulatory Commission (http://www.nerldc.org/Docs/Order_for_Detailed_Procedure_01-06-2010.pdf) REC registry (Source : https://recregistryindia.nic.in/)		
21	Common Practice analysis tool	Version 3	-
	VCS Standard	Version 3.7	21/06/2017
22	VCS Program Guide	Version 3.7	21/06/2017
23	Letter of undertaking/declarations from PP regarding not having created or sought any other form of environmental credits and other GHG programs for the project	-	08/08/2019
24	Central Electricity Authority (Installation and Operation of Meters) Regulations Notified on 17/03/2006 No. 502/70/CEA/DP&D Amendments Notified on 26/06/2010 No. 502/6/2009/DP&D/D-I	-	17/03/2006
25	Monthly JMRs for the project activity issued for the current monitoring period	-	-
26	VCS Listing Representation	-	
27	Communication Agreement for VCS representation	-	
28	Ministry of Environment and Forest notification dated 14/09/2006		dated 14/09/2006
29	Determination of Tariff for Procurement of Power by the Distribution Licensees and Others from Wind Power Projects dated 30/08/2016 by Gujarat Electricity Regulatory Commission Regulations (https://demo.kreatetechnologies.com/gerc/wp-content/uploads/document/07c74229-5dc4-4406-89d3-25a82fa0931b.pdf)	-	30/08/2016

APPENDIX 2: Abbreviations

ABT	Availability Based Tariff
ACM	Approved Consolidated Methodology
BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEA	Central Electricity Authority
CL	Clarification Request
DISCOM	Distribution company
DPR	Detailed Project Report
EB	Executive Board
EIA	Environmental Impact Assessment
EPC	Engineering and Procurement Contractor
ER	Emission Reductions
FAR	Forward Action Request
GHG	Greenhouse Gases
ISO	International Organization for Standardization
JMR	Joint Meter Readings
LCS	Local Controller System
MGRs	Monthly Generation Reports
MoEF	Ministry of Environment and Forest
MP	Monitoring Period
MR	Monitoring Report
MW	Mega Watt
MWh	MegaWatt hour
OM	Operating Margin
O&M	Operation & Maintenance
PD	Project Description
PP	Project proponent
PPA	Power Purchase Agreement
QA/QC	Quality Assurance/Quality Control
REC	Renewable Energy Certificates
tCO ₂	Tonnes of Carbon Dioxide
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Verified Carbon Standard
VCSA	Verified Carbon Standard Association

VCU	Verified Carbon Unit
-----	----------------------

APPENDIX 3: Competency Statement

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

The composition of audit team shall be approved by the 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	Qualification	Coverage of scope	Coverage of technical Area	Financial aspect	Host country Experience	Attendance to the On-Site Assessment
Vivek Kumar Ahirwar	Lead Auditor (LA) & Technical Expert (TE)	Yes (1)	Yes (1.2)	N/A	Yes	Yes
Simon Shen	Technical Reviewer (TR)	Yes (1)	Yes (1.2)	N/A	N/A	N/A

The curricula vitae of the DOE's team members are provided below:

Vivek Kumar Ahirwar is a BEE-Certified Energy Auditor by Govt of India with over eight years of relevant experience in energy efficiency, energy audit, thermal and electrical energy generation technology from renewable source and energy conservation in energy intensive industries, designated consumers and commercial buildings, implementation of energy conservation building codes, research, process and green building projects. He is a certified lead auditor for ISO 14001 EMS and 14064. He has experience under various categories of projects stating from renewable to waste to supercritical projects and WCD. He has successfully audited more than 100 GHG (CDM/VCS/GS) projects in different states across the

India. He has done Master in Technology (Energy Management) from a premier institute, School of Energy & Environmental Studies, DAVV, Indore (M.P.), India and Bachelor of Engineering (Mechanical Engineering) from Govt. Engineering college, Rewa, RGPV, India.

Simon Shen (Master Degree in Thermal Energy Engineering, Bachelor Degree in Environmental Engineering) is a Lead Auditor appointed by Applus+ LGAI for the GHG project assessment. He is based in Shanghai. He has several years of work experience in environmental protection field. Before he joined Applus+ LGAI, he had been worked for TÜV SÜD as a GHG Validator/Verifier and ISO 9001/14001 Lead Auditor for 3.5 years.

APPENDIX 4: Findings Overview**Table 1. Remaining FAR from validation and/or previous verification**

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

Table 2. CR from this Validation

CR ID	01	Section no.	PD Section 2.5	Date : 18/11/2019
Description of CL				
PP is requested to clarify why PP has applied VCS standard version 4 in section 2.5 for additionality assessment as in version 4 current project activity is not eligible.				
Project participant response				Date: 28/11/2019
CLP has used VCS version 3 for this project. Thus, PD has been updated accordingly and all the inconsistent version numbers have been corrected.				
Documentation provided by project participant				
Revised PD				
DOE assessment				Date: 02/12/2019
DOE assessment team confirm that PP has updated VCS standard version which is correct. Hence Accepted				
CR#1 Closed				

Table 3. CAR from this validation

CAR ID	01	Section no.	PD Section 3.1	Date :18/11/2019
Description of CAR				
1. PP is requested to change NEWNE grid to Indian Grid as per CEA database version 14 in section 3.1 of the PD. 2. PP is requested to include CEA database link in section 4.1 of PD				
Project participant response				Date :28/11/2019
Central Electricity Authority (CEA), Government of India initially has divided the Indian Power Sector into five regional grids viz. Northern, Eastern, Western, North-eastern and Southern. As of 31st December 2018, the Southern grid has also been synchronized with the NEWNE grid, hence forming one unified Indian Grid. The project activity is located in the state of Gujarat which come under Indian grid system. Thus, PD is now updated consistently to reflect the same.				
Documentation provided by project participant				
Revised PD				
DOE assessment				Date: 02/12/2019
DOE assessment Team confirm that PP has updated PD and included CEA database link in PD.				
CAR#1 Closed				

CAR ID	02	Section no.	PD Section 2.5	Date :18/11/2019
Description of CAR				

The PP is requested to provide the all supporting documents for Input Value used for demonstration of the additionality in section 2.5 of the PD	
Project participant response	Date :28/11/2019
All the supportive documents pertain to the input data used to demonstrate the additionality are now enclosed with this submission.	
Documentation provided by project participant	
Techno-commercial proposals from the WTG supplier and service provider for project operations 3rd party energy assessment report. Management decision to consider carbon revenue in the project P&L RfS document for Setting up of 1800 MW ISTS-Connected Wind Power Projects (Tranche-VIII)	
DOE assessment	Date: 02/12/2019
Assessment team confirm that document submitted by PP inline with requirements hence acceptable.	
CAR#2 Closed	

CAR ID	03	Section no.	PD, Section 4.2	Date :18/11/2019
Description of CAR				
PP is requested to clarify how meter calibration frequency set for 5 years.				
Project participant response				Date :28/11/2019
In line with para 18 (b) of "Installation and Operation of Meters Regulations" by Central Electricity Authority dated 17/03/2006 (https://www.aegcl.co.in/Metering_Regulations_Of_CEA_17_03_2006.pdf), all interface meters shall be tested at least once in five years. Thus, CLP has considered the usual calibration frequency as once in five years. Further, these meters shall also be tested whenever the energy and other quantities recorded by the meter are abnormal or inconsistent with electrically adjacent meters. Whenever there is unreasonable difference between the quantity recorded by interface meter and the corresponding value monitored at the billing center via communication network. The meters may be tested using NABL accredited mobile laboratory or at any accredited laboratory and recalibrated if required at manufacturer's works.				
Documentation provided by project participant				
Installation and Operation of Meters Regulations" by Central Electricity Authority dated 17/03/2006 (https://www.aegcl.co.in/Metering_Regulations_Of_CEA_17_03_2006.pdf)				
DOE assessment				Date: 02/12/2019
Assessment team confirm that PP has taken energy meter calibration frequency inline with Central electricity Authority guideline. Hence Acceptable				
CAR#3 Closed				

CAR ID	04	Section no.	PD, Section 4.3	Date :18/11/2019
Description of CAR				
Section 4.3 of the Project Description Template requires information on the monitoring plan including: - The process and schedule for obtaining, recording, compiling and analysing the monitored data and parameters including the following (including any diagrams, where appropriate) - Methods for measuring, recording, storing, aggregating, collating and reporting data and parameters Where applicable, procedures for calibrating equipment. - Organizational structure and responsibilities or personnel Policies for oversight and accountability Procedures for internal auditing and QA/QC - Procedures for handling non-conformances with validated monitoring plan - Sampling approaches. However, the Section 4.3 of the project description does not provide sufficient information, please clarify				

Project participant response	Date :28/11/2019
All the necessary information are now incorporated in the revised PD.	
Documentation provided by project participant	
Revised PD	
DOE assessment	Date: 02/12/2019
Assessment team confirm that PP has included Methods for measuring, recording, storing, aggregating, collating and reporting data and parameters Where applicable, procedures for calibrating equipment. Organizational structure and responsibilities or personnel Policies for oversight and accountability Procedures for internal auditing and QA/QC Procedures for handling non-conformances with validated monitoring plan Sampling approaches in section 4.3 of the PD. CAR#4 Closed	

CAR ID	05	Section no.	PD, Section 5.3	Date :18/11/2019
Description of CAR				
PP is requested to include details of stakeholder consultation meeting here, like list of attendees and their comments. How PP resolved their comments, please provide the summary along with supportive evidence.				
Project participant response				Date : 28/11/2019
Details of the stakeholders' consultation are now incorporated in the revised PD				
Documentation provided by project participant				
Revised PD				
DOE assessment				Date: 02/12/2019
Assessment team confirm that PP has updated stakeholder consultation meeting details in PD. Hence accepted CAR#5 Closed				

CAR ID	06	Section no.	PD, Section 5.4	Date :18/11/2019
Description of CAR				
PP is requested to clarify why no information has been provided in the section 5.4.				
Project participant response				Date :28/11/2019
Public comments received from global consultation process no comment received in public comment period. Hence section updated accordingly.				
Documentation provided by project participant				
Revised PD				
DOE assessment				Date: 02/12/2019
Assessment team confirm that PP has updated PD and no comment received in public commenting period. Hence Accepted. CAR#6 Closed				

Table 4. FAR from this validation

FAR ID	01	Section No.	PD	Date:18/11/2019
Description of FAR				
Since the project activity is yet to be implemented , hence during the validation process physical site visit is not conducted, thus the project implementation status including monitoring plan as described in the validated PD cannot be confirmed, therefore in line with the paragraph 36 of VVS for PAs version 02.0, the verifying VVB shall check/review the project implementation in accordance with the PD during 1st periodic verification after registration.				
Project participant response				Date: 24/1/2019

CLP has received the Letter of Award (LOA) from SECI for 250.8MW Sidhpur wind project on 28/09/2019. With this LOA, the schedule commissioning of the project needs to be achieved by 01/06/2021.

Documentation provided by Project participant

Letter of Award (LOA) from SECI

DOE assessment

Date: 02/12/2019

Project Proponent has very recently won this project under competitive reverse bidding process conducted by Solar Energy Corporation of India Ltd., Govt. of India. Presently, project proponent has just initiated the land identification, micro-setting and project construction planning. As part of the validation, assessment team has taken telephonic interview of PP as project implementation not yet started. Assessment team has raised FAR#1 to assess the site during first verification process to confirm the implementation of project activity as per PD description.