

Bundled Wind Power project in Koppal Karnataka



Document Prepared by **LGAI Technological Center S.A.** (Applus+ Certification)

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Summary:

Validation purpose: The main purpose of this project activity is to generate clean form of electricity through renewable Wind energy source for sale of electricity to the grid. The project activity involves installation of 64 WTGs of 2.1 MW each, totalling 134.4 MW Wind power project in Karnataka. However the total capacity already commissioned are 107.1 MW and rest 27.3 MW is yet to be commissioned.

The project will replace anthropogenic emissions of greenhouse gases (GHG's) estimated to be approximately 335,085 tCO_{2e} per annum, thereon displacing 357,692 MWh/year amount of electricity from the generation-mix of power plants connected to the Indian electricity grid, which is mainly dominated by thermal/ fossil fuel based power plant.

However, for already commissioned capacity in the project activity i.e. 107.1 MW, the project will replace anthropogenic emissions of greenhouse gases (GHG's) estimated to be approximately 266,634 tCO_{2e} per annum, thereon displacing 284,623 MWh/year amount of electricity

The objective of this validation activity is to have an independent third party for the assessment of the project design, estimated ER sheet and to ensure a thorough assessment of the proposed project activity against the applicable CDM and VCS requirements. In particular;

- the project's baseline is assessed against "ACM0002 version 19.0"
- the project's monitoring plan is assessed against "ACM0002 version 19.0"
- the projects compliance with, the requirements of Article 12 of the Kyoto Protocol, the CDM Modalities and Procedures as agreed in the Marrakech Accords under decision 3/CMP.1, the annexes to this decision, subsequent decisions and guidance made by COP/MOP & CDM Executive Board and other relevant rules, including the Host Country legislation and sustainability criteria along with VCS guideline and standard version 3.7
- CDM Validation and Verification Standard for project activities version 02
- CDM project standard for project activities version 02 CDM Project cycle procedure for project activities version 02
- VCS standard v3.7¹
- VCS guideline v3.7

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 estimated verified emission reductions (VERs).

A risk-based approach has been followed to perform this validation and verification activity. In the course of Validation, 07 Corrective Action requests (CARs) , 00 Clarification Requests (CLs) were raised and closed successfully and, 01 Forward action request (FARs) were raised. The review of the project description and additional documents related to baseline and monitoring methodology; the

¹<http://www.v-c-s.org/project/vcs-program/rules-and-requirements/>

subsequent background investigation, follow-up interviews and project owners have provided LGAI Technological Center S.A. (Applus+ Certification) with sufficient evidence to verify the fulfilment of the stated criteria of VCS.

Verification purpose:

The proposed project activity will assist development of renewable energy generation plants based on Wind energy technology in India and delivering electricity to the grid.

The proposed project is a voluntary action being undertaken by the project owner of the project activity. Infinite Solutions is acting as the other party for this project activity.

During the Current Monitoring Period from 02/03/2018 to 30/09/2019 (First and last date included) the project activity has contributing to the GHG reductions of 461,033 tCO_{2e}.

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

During the current monitoring period, project activity undergoes continued operation since their commissioning and no major breakdown had taken place.

The objective of this verification activity is to have an independent third party for the assessment of the project design, Actual ER sheet and to ensure a thorough assessment of the proposed project activity against the applicable CDM and VCS requirements. In particular;

- the project's baseline is assessed against "ACM0002 version 19.0"
- the project's monitoring plan is assessed against "ACM0002 version 19.0"
- the projects compliance with, the requirements of Article 12 of the Kyoto Protocol, the CDM Modalities and Procedures as agreed in the Marrakech Accords under decision 3/CMP.1, the annexes to this decision, subsequent decisions and guidance made by COP/MOP & CDM Executive Board and other relevant rules, including the Host Country legislation and sustainability criteria along with VCS guideline and standard version 3.7
- CDM Validation and Verification Standard for project activities version 02 CDM project standard for project activities version 02 CDM Project Cycle procedure for project activities version 02
- VCS standard v3.7²
- VCS guideline v3.7

A risk-based approach has been followed to perform this verification activity. In the course of verification, 02 Corrective Action requests (CARs) and 00 Clarification Requests (CLs), 00 Forward action request (FARs) were raised and successfully closed. The review of the Monitoring report and

²<http://www.v-c-s.org/project/vcs-program/rules-and-requirements/>

additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews and project owners have provided LGAI Technological Center S.A. (Applus+ Certification) with sufficient evidence to verify the fulfillment of the stated criteria of VCS.

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1 INTRODUCTION

1.1 Objective

LGAI Technological Center S.A. (Hereinafter referred as Applus+ Certification) has been appointed by “Skeiron Renewable Energy Kushtagi Private Limited”, “Saroja Renewables Limited”, “Shanay Renewables Ltd.” to perform the validation and verification of the project entitled under VCS standard and guideline version 3.7. The objective of this joint validation & verification activity is to have an independent third party for the assessment of the project design, ER sheet and to ensure a thorough assessment of the proposed project activity against the applicable CDM and VCS requirements. In particular:

- the project's baseline is assessed against “ACM0002 v19.0”
- the project's monitoring plan is assessed against “ACM0002 v19.0”
- the project's compliance with the requirements of Article 12 of the Kyoto Protocol, the CDM Modalities and Procedures as agreed in the Marrakech Accords under decision 3/CMP.1, the annexes to this decision, subsequent decisions and guidance made by COP/MOP & CDM Executive Board and other relevant rules, including the Host Country legislation and sustainability criteria along with VCS guideline and standard version 3.7
- CDM Validation and Verification Standard for project activities version 02CDM Project Standard for project activities version 02CDM Project Cycle procedure for project activities version 02
- VCS standard v3.7³
- VCS guideline v3.7

Validation & verification 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 estimated verified emission reductions (VERs).

1.2 Scope and Criteria

The scope of the Joint validation and verification is the independent and objective review of the Joint Project Description & Monitoring Report. The Joint VCS PD & MR are reviewed against the relevant criteria (see 1.1) and decisions by the CDM Executive Board and VCS executive board, including the approved baseline and monitoring methodology. The validation and verification was based on the guidance given in the CDM Project Standard for project activities version 02.0, CDM Project Cycle Procedure for project activities version 02.0, VCS guideline and standard version 3.7

³<http://www.v-c-s.org/project/vcs-program/rules-and-requirements/>

The assessment team has employed a risk-based approach to assess the completeness and accuracy of the claims and conservativeness of the assumptions in the Joint VCS PD & MR. The main focus of the assessment team is to identify the significant risks for the project implementation and the generation of VERs. The validation and verification is not meant to provide any consulting towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design and monitoring report combined.

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

1.3 Level of Assurance

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

1.4 Summary Description of the Project

The main purpose of this project activity is to generate clean form of electricity through renewable Wind energy source for sale of electricity to the grid. The project activity involves installation of 64 WTGs of 2.1 MW each, totalling 134.4 MW Wind power project in Karnataka. However the total capacity already commissioned are 107.1 MW and rest 27.3 MW is yet to be commissioned

The details of the project and the end usage are as below:

Name of Project Developer	WTG Capacity	No. of WTGs	Project Capacity	Location	End Usage
Skeiron Renewable Energy Kushtagi Private Limited	2.1 MW/WTG	24	50.4	Koppal District & Bagalkot district, Karnataka, India	Sale to grid
Saroja Renewables Limited	2.1 MW/WTG	25	52.5	Bagalkot district, Karnataka, India	
Shanay Renewables Ltd.	2.1 MW/WTG	15	31.5	Kushtagi, Koppal District, Karnataka, India	
Total		64	134.4 MW		

Assessment team confirm via onsite visit that the project is located State of Karnataka and connected with Indian grid. Details of the capacity & installation dates are mentioned in the table below:

Skerion Renewable Energy Kushtagi Private Limited			
Metering Loc.no.	WTG Loc. No.	Comm. Dates	Total Capacity
KST - 147	100, 126, 152, 153, 154, 155	02/03/2018	50.4 MW
KST - 147	99, 147, 98, 123, 125	02/03/2018	
KST - 177	177, 148, 149, 188, 189, 233, 234, 235	02/03/2018	
KST - 177	191, 236	31/03/2018	
KST - 230	230	31/03/2018	
KST - 101	101, 102	31/03/2018	

Saroja Renewables Limited			Total Capacity
Metering Loc.	WTG Loc. No.	Comm. Dates	35.7 MW
KST - 51	51	28/03/2018	
KST - 67	65, 67, 105, 106, 122	28/03/2018	
KST - 67	66, 103, 121	31/03/2018	
KST - 71	47, 48, 70, 71, 124, 46, 49, 68	28/03/2018	

Shanay Renewables Ltd.			Total Capacity
Metering Loc.	WTG Loc. No.	Comm. Dates	21 MW
KST -131	90, 131	28/03/2018 & 31/03/2018	
KST-130	95, 97, 42, 75, 96, 128, 130, 72	28/03/2018 & 31/03/2018	

The rest Capacity of 27.3 MW is not commissioned till the time of Validation. The project is connected to total 6 feeders bus bar and spare 2 feeders connected to substation of 110/33kV at Shiragumpi.

Assessment team checked the technical details of the project activity during onsite visit and also cross checked the same from manufacturer technical specification. The details of the same are as below:

Project Technology Details

The project installs Suzlon make WTGs of individual capacity 2.1 MW. The salient Features of Suzlon S-S111-2.1 MW WTG are as follows: -

Parameter	Specifications
	2.1 MW -Suzlon

Rotor	
Installed electrical output	2100 kW
Diameter	111.8 m
Cut-in wind speed	3 m/s
Rated wind speed	12.5 m/s
Cut-out wind speed	30 m/s
Rotor swept area	9852 m ²
Regulation	Pitch
Generator	
Type	Asynchronous, 3 Phase Induction
Rated output	2100 kW
Operating voltage	690 V
Frequency	50 Hz / 60 Hz

Assessment team also checked the detail related to the implementation of the project activity and found the same to be appropriate and correct. The chronology is as below:

Sl.No.	Particulars	Name of PPs	Date	Document checked by the assessment team	
1.	BR	Skeiron Renewable Energy Kushtagi Private Limited	20/12/2017	Board resolution is checked.	
		Saroja Renewables Limited			
		Shanay Renewables Ltd.			
2.	Supply Order Contract	Skeiron Renewable Energy Kushtagi Private Limited	Erection & Commission work, Electrical Work & Civil Work	02/02/2018	Work Order of Erection & Commission work is checked. Work Order of Electrical Work is checked. Work Order of Civil Work is checked.
		Saroja Renewables Limited	Erection & Commission work, Electrical Work & Civil Work	27/12/2017	Work Order of Erection & Commission work is checked. Work Order of Electrical Work is checked. Work Order of Civil Work is checked.
		Shanay Renewables Ltd.	Erection & Commission work, Electrical Work & Civil Work	27/12/2017	Work Order of Erection & Commission work is checked. Work Order of Electrical Work is

					checked. Work Order of Civil Work is checked.
3.	O&M	Skeiron Renewable Energy Kushtagi Private Limited	O& M Contract between Skeiron Renewable Energy Kushtagi Private Limited and Suzlon Global Services Limited	29/03/2018	O& M Contract has been checked
		Saroja Renewables Limited	O& M Contract between Saroja Renewables Limited and Suzlon Global Services Limited	22/01/2018	O& M Contract has been checked
		Shanay Renewables Ltd.	O& M Contract between Shanay Renewables Ltd and Suzlon Global Services Limited	22/01/2018	O& M Contract has been checked
4.	Contract between consultant and PP	Skeiron Renewable Energy Kushtagi Private Limited Saroja Renewables Limited Shanay Renewables Ltd.		05/11/2019	Contract with PP has been checked
5	Contract between	Skeiron Renewable Energy Kushtagi		13/11/2019	Contract between

	consultant and DOE	Private Limited Saroja Renewables Limited Shanay Renewables Ltd.		consultant and DOE has been checked
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2 VALIDATION AND VERIFICATION PROCESS

2.1 Method and Criteria

Validation and Verification Scope: The scope is defined as an independent and objective review of the Joint project design document and Monitoring report. The Joint VCS PD and MR is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords and the relevant decisions by the CDM Executive Board and VCS standard and guideline version 3.7, including the approved baseline and monitoring methodology ACM0002 version 19.0 (for the present scenario in the project). The validation and verification were based on the requirements in the CDM Validation and Verification Standard for project activities version 02, CDM project cycle procedure for project activities version 02, CDM project standard for project activities version 02 and VCS guideline and standard version 3.7.

The validation and verification are not meant to provide any consulting towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the combined project description and the Monitoring report.

Validation and Verification Process: The project assessment is based on the Clean Development Mechanism Validation and Verification Standard for project activities version 02.0 and VCS standard and guideline version 3.7 and is conducted using standard auditing techniques to assess the correctness of the information provided by the project participants. Before the assessment begins, members of the team covering the technical scope(s), sectoral scope(s), and relevant host country experience for evaluating the VCS project activity are appointed.

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

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

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

Appointment of the assessment team

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

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

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

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

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

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

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

Document review

The Joint VCS PD & MR submitted by the Client was reviewed against the approved methodology and other relevant criteria to verify the correctness, credibility, and interpretation of the presented information. Furthermore, a cross-check between information provided and information from other sources has been done. A complete list of all documents and evidence material reviewed is included in this report below in appendix 1.

Follow-up interviews

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

Resolution of Clarification and Corrective Action Request

The objective of this phase of the joint validation and verification was to resolve the requests for corrective actions and clarification and any other outstanding issues which need to be clarified for LGAI Technological Center S.A. (Applus+ Certification) positive conclusion on the project design and Monitoring report. The Corrective Action Requests and Clarification Requests raised by LGAI Technological Center S.A. (Applus+ Certification) were resolved during communications between the

Client and Applus+ Certification to guarantee the transparency of the validation process, the concerns raised and responses given are summarized below in the appendix 2.

The Joint VCS PD & MR Version 02 submitted by project owners on 17/12/2019 respectively serve as the basis for the final assessment presented. Additional changes to the project during the joint validation and verification process are not considered to be significant with respect to the main CDM/VCS objectives. The two CDM/VCS main objectives are the reduction of anthropogenic GHG emissions and the contribution of sustainable development to the host country.

Internal quality control

As final step of a joint validation and verification of the final documentation including the final Joint validation and verification report and the checklist have to undergo an internal quality control by the technical review committee, i.e. each report has to be finally approved either by the head of the technical review committee or the deputy. In case one of these two persons is part of the assessment team approval can only be given by the other one to avoid any conflict of Interest.

After confirmation of the project owners the positive validation/verification opinion and relevant documents are submitted to the VCS secretariat through the VCS web-platform.

2.2 Document Review

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

2.3 Interviews

The site visit for the project activity was carried out from 14/12/2019- VCS VALIDATION to 15/12/2019- VCS VERIFICATION. No sampling procedures were adopted either in document verification and all the document were cross checked to ensure conservative estimation of emission reduction. Kindly find below names of the persons interviewed (during onsite and telephonic interview later) for the site.

Serial Number	Name of the site	Name of the person	Designation
1.	Bagalkot and Koppal District	Jeethendra K	Deputy General Manager (for both Bagalkot & Koppal sites)
2.	Bagalkot	N. G. Ranga	Teacher
3.	Koppal	Pingali Venkyaga	Principal

2.4 Site Inspections

Duration of on-site inspection: 14/12/2019- VCS VALIDATION to 15/12/2019- VCS VERIFICATION				
No.	Activity performed on-site	Site location	Date	Team member
1.	Assessment team checked the implementation of the project, Baseline emission, Emission reduction calculation, technical description of the project and Monitoring and local stakeholder consultation	The detail location of the project is as below: The WTGs installed by the project proponent are distributed across the Bagalkot & Koppal District of Karnataka	14/12/2019- VCS VALIDATION to 15/12/2019- VCS VERIFICATION	Mr. Sukanta Das

2.5 Resolution of Findings

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

The final Joint VCS PD & MR Version 02 submitted by project owners on 17/12/2019 serves as the basis for the final assessment presented. Additional changes to the project during the validation and verification process are not considered to be significant with respect to the main CDM/VCS objectives. The two CDM/VCS main objectives are the reduction of anthropogenic GHG emissions and the contribution of sustainable development to the host country.

Areas of validation and verification findings	No. of CL	No. of CAR	No. of FAR
Project design document and Monitoring report	00	00	00
Description of project activity	00	01	00
Application of selected baseline and monitoring methodology and selected standardized baseline			
- Applicability of methodology and standardized baseline	00	00	00
- Deviation from methodology	00	00	00
- Clarification on applicability of methodology, tool and/or standardized baseline	00	00	00
- Demonstration of additionality	00	01	00
- Emission reductions	00	01	00
- Monitoring plan	00	00	00
-Stakeholders consultation process	00	01	00
- Public comments	00	01	00
Others (please specify)- No Net harm- For Validation Matter related to double counting- for validation FAR related to implementation status of the project activity- For Validation	00	02	01
Others (please specify)-Matter related to Emission reduction calculation- for verification	00	02	00

ER achieved, Matter related to feeder details, breakdown and Calibration- for verification			
Total	00	Validation+ Verification: 09	VALIDATION FAR-01

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

2.5.1 Forward Action Requests

FAR is raised related to implementation status of the project activity at this stage of Validation and Verification.

3 VALIDATION FINDINGS

3.1 Project Details

The main purpose of this project activity is to generate clean form of electricity through renewable Wind energy source for sale of electricity to the grid. The project activity involves installation of 64 WTGs of 2.1 MW each, totalling 134.4 MW Wind power project in Karnataka. However the total capacity already commissioned are 107.1 MW and rest 27.3 MW is yet to be commissioned.

The project is located State of Karnataka and connected with Indian grid for Sale to grid. Details of the capacity & installation dates are already mentioned in section 1.4 of this report and checked and found correct by the assessment team. The technical specifications are mentioned in section 1.4 of this report and same were checked during site visit and found correct.

Assessment team checked onsite and confirms that the details of the project proponent is as below:

Organization name	Skeiron Renewable Energy Kushtagi Private Limited
Contact person	Murali Krishnam Raju M
Title	Senior Manager - Commercial
Address	Plot No. #1131/A, Road no. 36 Jubilee Hills, Hyderabad – 500033. Telangana, India.
Telephone	+91 40 40301004
Email	muraliraju.m@greenkogroup.com

Organization name	Saroja Renewables Limited
Contact person	Murali Krishnam Raju M
Title	Senior Manager - Commercial
Address	Plot No. #1131/A, Road no. 36 Jubilee Hills, Hyderabad – 500033. Telangana, India.
Telephone	+91 40 40301004
Email	muraliraju.m@greenkogroup.com

Organization name	Shanay Renewables Ltd.
Contact person	Murali Krishnam Raju M
Title	Senior Manager - Commercial
Address	Plot No. #1131/A, Road no. 36 Jubilee Hills, Hyderabad – 500033. Telangana, India.

Telephone	+91 40 40301004
Email	muraliraju.m@greenkogroup.com

Assessment team checked onsite and confirms that the details of the other entity involved is as below:

Organization name	Infinite Solutions
Role in the project	Project Consultant
Contact person	Richa Thakur
Title	Manager - Operations
Address	611, Chetak Centre Main, 12/2 RNT Marg, Indore- 452001
Telephone	+91- 9589804304
Email	richa@infisolutions.org

Project Start Date

Start date of the project activity is the earliest date of interconnection with the grid i.e. 02/03/2018. The project start date is the earliest commissioning date amongst the entire project WTGs which are part of this Large-Scale Wind power project. Assessment team checked the commission details from the commissioning certificate provided by the Government agencies.

Project crediting period Date

Assessment team confirms that the crediting period dates for the project is as below:

Crediting Period Start date: 02/03/2018

Crediting Period End date: 01/03/2028

Estimated life time of the project: 25 years- (As per the CERC (=Central Electricity Regulation Commission) guideline-<http://www.cercind.gov.in/2017/regulation/Noti131.pdf>).

The project activity adopts renewable crediting period with the first crediting period of 10 years and with an option to renew twice, considering the lifetime of the project activity to be 25 years.

Project Scale and Estimated GHG Emission Reductions or Removals

Assessment team confirms that the project activity falls under the category of Project that involves setting up of 134.4 MW wind power project activity.

Project Scale	
Project	
Large project	✓

As the estimated annual average GHG emission reductions or removal per year is 335,085 tCO_{2e} (for 134.4 MW) which is more than 300,000 tonnes of CO_{2e} per year, thus the project activity falls in the category of Project.

For 134.4 MW (Total Project capacity)

Year	Estimated GHG emission reductions or removals (tCO ₂ e)
Year 1	335,085
Year 2	335,085
Year 3	335,085
Year 4	335,085
Year 5	335,085
Year 6	335,085
Year 7	335,085
Year 8	335,085
Year 9	335,085
Year 10	335,085
Total estimated ERs	335,0850
Total number of crediting years	10
Average annual ERs	335,085

For 107.1 MW (Already Commissioned Capacity)

Year	Estimated GHG emission reductions or removals (tCO ₂ e)
Year 1	266,634
Year 2	266,634
Year 3	266,634
Year 4	266,634
Year 5	266,634
Year 6	266,634

Year 7	266,634
Year 8	266,634
Year 9	266,634
Year 10	266,634
Total estimated ERs	2,666,340
Total number of crediting years	10
Average annual ERs	266,634

The above estimated emission reduction is confirmed by assessment team via emission reduction calculation spreadsheet. The calculation is conservative and this acceptable to the assessment team.

Project location

Project location is confirmed by the assessment team during the site visit. Assessment team also checked with the GPS meter regarding the latitude and longitude of the project site and confirm that the details as mentioned in the VCS PD and MR are correct. The detail is as below:

Skerion WTG Location No

WTG ID	Degrees	Minutes	Seconds		Degrees	Minutes	Seconds	
KST098	15.00	55.00	1.18	N	76.00	10.00	56.69	E
KST099	15.00	55.00	18.07	N	76.00	10.00	55.78	E
KST100	15.00	55.00	36.86	N	76.00	10.00	53.80	E
KST101	15.00	54.00	40.72	N	76.00	15.00	42.32	E
KST123	15.00	55.00	51.57	N	76.00	11.00	40.67	E
KST125	15.00	54.00	45.33	N	76.00	12.00	36.97	E
KST126	15.00	54.00	27.38	N	76.00	12.00	46.92	E

KST147	15.00	53.00	42.58	N	76.00	13.00	36.41	E
KST148	15.00	54.00	19.33	N	76.00	13.00	51.50	E
KST149	15.00	54.00	23.17	N	76.00	13.00	18.10	E
KST152	15.00	55.00	28.71	N	76.00	13.00	11.26	E
KST153	15.00	55.00	38.44	N	76.00	12.00	48.45	E
KST154	15.00	55.00	53.58	N	76.00	12.00	35.26	E
KST155	15.00	56.00	14.49	N	76.00	12.00	18.97	E
KST177	15.00	53.00	50.92	N	76.00	14.00	26.29	E
KST188	15.00	53.00	15.44	N	76.00	15.00	19.90	E
KST189	15.00	53.00	42.34	N	76.00	15.00	21.52	E
KST191	15.00	52.00	55.13	N	76.00	15.00	43.78	E
KST230	15.00	54.00	22.74	N	76.00	16.00	2.65	E
KST233	15.00	54.00	2.66	N	76.00	17.00	4.56	E
KST234	15.00	53.00	49.30	N	76.00	17.00	1.96	E
KST235	15.00	53.00	31.31	N	76.00	17.00	6.69	E
KST236	15.00	52.00	55.12	N	76.00	16.00	50.86	E

KST102	15.00	55.00	2.48	N	76.00	15.00	50.43	E
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SAROJA WTG Location No

WTG ID	Degrees	Minutes	Seconds		Degrees	Minutes	Seconds	
KST071	15.00	54.00	47.93	N	76.00	10.00	33.47	E
KST046	15.00	53.00	41.36	N	76.00	9.00	25.87	E
KST047	15.00	52.00	56.68	N	76.00	9.00	33.35	E
KST048	15.00	52.00	36.25	N	76.00	9.00	32.90	E
KST049	15.00	52.00	9.93	N	76.00	8.00	59.73	E
KST051	15.00	55.00	14.79	N	76.00	9.00	31.75	E
KST065	15.00	56.00	27.83	N	76.00	9.00	45.29	E
KST066	15.00	56.00	2.42	N	76.00	9.00	25.91	E
KST067	15.00	55.00	27.17	N	76.00	10.00	5.39	E
KST068	15.00	55.00	41.20	N	76.00	10.00	21.71	E
KST070	15.00	55.00	1.33	N	76.00	10.00	5.98	E
KST103	15.00	56.00	15.59	N	76.00	10.00	51.91	E
KST105	15.00	57.00	28.11	N	76.00	11.00	24.32	E

KST106	15.00	56.00	37.51	N	76.00	10.00	48.88	E
KST121	15.00	56.00	0.96	N	76.00	10.00	50.24	E
KST122	15.00	56.00	23.88	N	76.00	9.00	5.98	E
KST124	15.00	53.00	6.23	N	76.00	9.00	11.31	E

SHANAY WTG Location No

WTG ID	Degrees	Minutes	Seconds		Degrees	Minutes	Seconds	
KST072	15.00	54.00	29.32	N	76.00	10.00	40.06	E
KST075	15.00	52.00	6.47	N	76.00	11.00	21.12	E
KST090	15.00	52.00	50.70	N	76.00	11.00	1.47	E
KST095	15.00	54.00	7.41	N	76.00	11.00	22.30	E
KST096	15.00	51.00	44.55	N	76.00	11.00	24.55	E
KST097	15.00	54.00	34.51	N	76.00	11.00	18.52	E
KST128	15.00	51.00	24.03	N	76.00	10.00	40.66	E
KST130	15.00	53.00	44.67	N	76.00	11.00	16.62	E
KST131	15.00	53.00	22.60	N	76.00	13.00	8.18	E
KST042	15.00	51.00	25.02	N	76.00	11.00	32.37	E

Conditions prior to project initiation

Assessment team during the desk review and onsite visit confirms that the project is a Wind power project and does not involve generation of GHG emissions for the purpose of their subsequent reduction, removal or destruction. The baseline as described in section 3.3.4 of this report will continue to be the baseline in the absence of project activity.

Project compliance with applicable laws, statutes and other regulatory frameworks

Assessment team confirms that the Project has received necessary approvals for development and commissioning for the proposed Wind project from the state Nodal agencies and is in compliance to the local laws and regulations. Assessment team checked the Commissioning certificates, power purchase agreement with state board, Installation report for Wind power in the name of PP issued by state nodal agency of the respective state to confirm the project capacity and its relevant statutory requirements as per the host country regulations.

Assessment team noted that the project fulfils the norms put down by Central Pollution Control Board norms. As per Central Pollution Control Board (Ministry of Environment & Forests, Govt. of India), final document on revised classification of Industrial Sectors under Red, Orange, Green and White Categories (29/02/2016)

Being a renewable power project it falls under the category of White and thus these projects do not need clearance for Consent to operate and only needs to inform the relative State Pollution Control Board. The same is done for the project and thus it can be confirmed that it follows the local laws of the host country.

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

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

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

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

Thus assessment team confirms that the project activity follows the National and local law and regulation of the host country.

Project Ownership

Skeiron Renewable Energy Kushtagi Private Limited, Saroja Renewables Limited, Shanay Renewables Ltd are the project proponent (PP) of project activity and they have the legal right to control and operate the project activities.

The project ownership has been checked by the Assessment Team and demonstrated through below supporting documents:

1. **Commissioning certificates** – The letter from State Nodal Agency to the **respective project owners** for registration of commissioning of generation facility indicates that PP has the legal right to control and operate the project activities.
2. **Contract with EPC contractor** – The purchase order on the name of **respective project Owners** indicates that PP has the legal right to control and operate the project activities.

Emissions trading programs and other binding limits

Assessment team confirms that the 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 in any Emission Trading program or other binding limits. Audit team checked the REC Mechanism database of India and found that the project activity is not accredited⁴ / registered⁵ under REC mechanism. Further, Declaration in effect of the same has been submitted by project proponent to audit team and found to be correct. Thus it is concluded that the project activity not involved on other Emissions trading programs and other binding limits.

Additional Information Relevant to the Project

Eligibility Criteria for grouped projects

This is not a grouped project activity. Thus, this section is not applicable for this project.

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. The details are presented transparently to the assessment team for analysis which lead to positive conclusion for this validation and verification.

Sustainable Development

Contribution to sustainable development:

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

Social well-being: The project would help in generating employment opportunities during the construction and operation phases. The project activity will lead to development in infrastructure in the region like development of roads and also may promote business with improved power generation.

⁴ https://recregistryindia.nic.in/index.php/publics/accredited_regens

⁵ https://recregistryindia.nic.in/index.php/publics/registered_regens

Economic well-being: The project is a clean technology investment in the region, which would not have been taken place in the absence of the VCS benefits the project activity will also help to reduce the demand supply gap in the state.

Technological well-being: The successful operation of project activity would lead to promotion of Wind based power generation and would encourage other entrepreneurs to participate in similar projects.

Environmental well-being: Wind being a renewable source of energy, it reduces the dependence on fossil fuels and conserves natural resources which are on the verge of depletion. Due to its zero emission the Project activity also helps in avoiding significant amount of GHG emissions and specific pollutants like SO_x, NO_x, and SPM associated with the conventional thermal power generation facilities.

Project undergone continuous operation and only scheduled maintenance as per the manufacturer specification is considered. Audit team checked the maintenance records and operation log of the project activity and no unforeseen incident observed for the present monitoring period.

3.2 Participation under Other GHG Programs

The project has neither been registered nor seeking registration under any other GHG programs. The project is seeking registration only in VCS program. Audit team checked the REC Mechanism database of India and found that the project activity is not accredited / registered under REC mechanism. Further, declaration for the same dated 24/11/2019 is checked and found correct by the assessment team. Also assessment team checked the following registries to confirm the same. The details of the registries checked are as follows:

1. <https://www.recregistryindia.nic.in/>
2. <http://cdm.unfccc.int/>
3. <http://www.goldstandard.org/>

Rejection by other GHG programs

The Project is not rejected by other GHG programs. A declaration for the same dated 24/11/2019 is checked and found correct by the assessment team. Also assessment team checked the following registries to confirm the same. The details of the registries checked are as follows:

1. <https://www.recregistryindia.nic.in/>
2. <http://cdm.unfccc.int/>
3. <http://www.goldstandard.org/>
4. www.v-c-s.org

The Project has no intend to generate any other form of GHG-related environmental credit for GHG emission reductions or removals claimed under the VCS Program.

Renewable energy certificates are available for trading in the host country However, the same is not availed by the project participant. The undertaking regarding the same is submitted by PP which is acceptable to the assessment team and assessment team also checked the REC web site (<https://recregistryindia.nic.in/>) and found the declaration to be correct.

3.3 Application of Methodology

3.3.1 Title and Reference

Assessment team checked that following methodology and tools are applicable for the project activity. The details are as below:

Title: Grid-connected electricity generation from renewable sources

Reference: The project activity meets the eligibility criteria of large scale project as it is more than 15 MW

Methodology : ACM0002: Grid-connected electricity generation from renewable sources - Version 19.0⁶

Type I : Energy industries (renewable / non-renewable sources)

Category: Approved Consolidated Methodology (ACM0002)

Tools referred with above methodology and applicable for project activity are:

- Tool to calculate the emission factor for an electricity system⁷ - Version 07.0 (EB 100, Annex 04)
- Tool for the demonstration and assessment of additionality --- Version 07.0.0, EB 70, Annex 8

3.3.2 Applicability

The applied baseline methodology is justified as it has been demonstrated that the proposed project activity is:

Applicability 1: The project activity is installation of a new grid connected Wind power plant (Option 1 (A)) at a site where no renewable power plant was operated prior to the implementation of the project activity (Greenfield plant) and hence this criterion is applicable.

Applicability 2: The proposed project activity is an installation of a new grid connected Wind power plant and hence this condition is met. The option (a) of applicability criteria 2 is applicable as project is renewable energy power plant/unit.

Applicability 3: The project is installation of new Wind energy-based electricity generation plants (not a hydro power plant). Hence this criterion is not applicable.

Applicability 4: The project is Wind power project and thus the criterion is not applicable to this project activity.

Applicability 5: The project is Wind power project and thus the criterion is not applicable to this project activity.

Applicability 6: The project is Wind power project and thus the criterion is not applicable to this project activity.

Applicability 7: The project activity is installation of a new grid connected Wind power project and does not involve switching from fossil fuel to renewable energy and hence this criterion is not relevant to the project activity.

⁶ <http://cdm.unfccc.int/methodologies/DB/VJ19AX539D9MLOPXN2AY9UR1N4IYGD>

⁷ <http://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-07-v7.0.pdf>

&

This is a Wind power plant and not a biomass fired plant and hence this applicability criterion is not applicable to the project activity.

Applicability 8: The project activity is a new grid connected Wind power plant and not a retrofits, replacement or capacity additions and therefore this criterion is not applicable to the project activity.

Applicability 9: Please refer below

Applicability conditions of “Tool to calculate the emission factor for an electricity system”

- OM, BM and CM are estimated using the tool for calculating baseline emissions.
- The project activity is grid connected and thus emission factor is calculated and thus OM, BM and CM are estimated using the tool for calculating baseline emissions.
- The project activity is located in India, a non-Annex I country. Therefore, tool is applicable for the project activity.
- The project is a Wind power project and there is no involvement of biofuels. Therefore, this criterion is not applicable for the project activity.

LGAI Technological Center S.A. (Applus+ Certification) confirms that the application of the baseline methodology is transparent and conservative and confirms that the chosen baseline and monitoring methodology i.e. ACM0002 version 19.0 is applicable to the project activity.

The project activity qualifies as Type I during every year of the crediting period in accordance with applicable provisions for project activity eligibility as discussed above. Also the total installed capacity of project activity is more than 15 MW which is applicable as per large scale project activities methodology ACM0002 version 19.0. The project capacity will be always remain the same and hence the project activity will always be large scale project activities throughout the crediting period and thereafter.

3.3.3 Project Boundary

Project boundary has been ascertained and confirmed during the site visit using ACM0002 version 19.0 – “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/VCS project power plant is connected to”.

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

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

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

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

Source		Gas	Included?	Justification/Explanation
Baseline	Grid connected electricity generation.	CO ₂	Yes	Main emission source
		CH ₄	No	Minor emission source
		N ₂ O	No	Minor emission source
		Other	No	No other emissions are emitted from the project
Project	Greenfield Wind Power Project Activity.	CO ₂	No	No CO ₂ emissions are emitted from the project
		CH ₄	No	Project activity does not emit CH ₄
		N ₂ O	No	Project activity does not emit N ₂ O
		Other	No	Project activity does not emit other forms of GHG emissions

3.3.4 Baseline Scenario

Assessment team confirms that being a grid connected Wind energy generation project, PP developed the project based on the Methodology ACM0002 version 19.0. As per methodology *if the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following:*

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”.

As per CDM Validation and Verification Standard for project activities version 02, “where the baseline scenario is not prescribed in the approved methodology, the DOE shall assess the list of identified credible alternatives to the project activity in the JOINT VCS PD & MR selected to determine the most realistic baseline scenario.” Thus, JOINT VCS PD & MR should mention the credible alternatives to the project activity in order to determine the most realistic baseline scenario. As the selected large-scale methodology clearly mention the baseline scenario and the same has been opted in this project, therefore, no further analysis on baseline is required.

Validation Team, therefore, concludes that the JOINT VCS PD & MR conforms to the guidance given by EB via CDM Validation and Verification Standard for project activities version 02 and VCS via VCS standard version 3.7.

The project activity involves setting up Wind projects to harness the power of sun and Wind to produce electricity and use for Sale to grid usage. In the absence of the project activity, the equivalent amount of power would have been supplied by the Indian grid, which is fed mainly by fossil fuel fired plants.

In the absence of the project activity, the equivalent amount of power would have been drawn from the Indian grid. Hence, the baseline for the project activity is the equivalent amount of power from the Indian grid.

The combined margin ($EF_{grid, CM, y}$) is the result of a weighted average of two emission factor pertaining to the electricity system: the operating margin (OM) and build margin (BM). Calculations for this combined margin must be based on data from an official source (where available) and made publically available. The Central electricity authority (CEA) database version 13 is the latest available data at the time of JOINT VCS PD & MR submission to DOE for validation, hence same is considered for emission factor calculations.

The combined margin of the Indian grid used for the project activity is as follows:

Parameter	Value	Nomenclature	Source
EF _{grid,CM,y}	0.9368 tCO ₂ /MWh	Combined margin CO ₂ emission factor for the project electricity system in year y	Calculated as the weighted average of the operating margin (0.75) & build margin (0.25) values, sourced from Baseline CO ₂ Emission Database, Version 14.0, Dec 2018 published by Central Electricity Authority (CEA), Government of India
EF _{grid,OM,y}	0.9610 tCO ₂ /MWh	Operating margin CO ₂ emission factor for the project electricity system in year y	Calculated as the last 3 year (2015-16, 2016-17, 2017-18) generation-weighted average, sourced from Baseline CO ₂ Emission Database, Version 14.0, Dec 2018 published by Central Electricity Authority (CEA), Government of India
EF _{grid,BM,y}	0.8644 tCO ₂ /MWh	Build margin CO ₂ emission factor for the project electricity system in year y	Baseline CO ₂ Emission Database, Version 14.0, May 2018 published by Central Electricity Authority (CEA), Government of India

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

Assessment team thus confirmed that baseline is selected as per the applied methodology and combined margin is calculated as per the tool and thus acceptable to the assessment team.

3.3.5 Additionality

During conceptualization of the project activity, board of directors of the project proponents considered the VCS revenue to improve the project financials. During the board meeting for board of Directors decided that they would consider VCS revenue for their project activity. In continuation to the board decision, PP issued the respective purchase order for the supply of Wind plant.

The detail of project commissioning, technical specification is already checked by the assessment team and mentioned in section 1.4 of this report. For the all the project proponent the Board decision date is 20/12/2017 which was checked by the assessment team and found correct.

In line with VCS Standard version 3.7, the additionality of the Project activity is ascertained in line with the applicable guidance from the UNFCCC. The demonstration of additionality for the proposed Project activity is being carried out in accordance with the additionality tool provided by the UNFCCC i.e. "Tool for demonstration and assessment of Additionality" Version 07.0.0. The tool provides a step-wise approach to demonstrate additionality which is displayed below:

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

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

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

Alternative 1: The proposed project activity without VCS benefit;

Alternative 2: Continuation of the current situation, i.e., electricity will continue to be generated by the existing generation mix operating in the grid.

Having regard to the fact that the project activity under consideration is a Wind power project, validation team is convinced that there are no other realistic and credible alternatives. Both the alternatives are in compliance with all applicable legal and regulatory requirements as;

- the implementation of project activity is a voluntary initiative and is not mandatory or a legal requirement;

- the applicable environmental regulations do not restrict the use of Wind energy; and
- There is no legal requirement on the choice of a particular technology.

Assessment team noted that the project fulfils the norms put down by Central Pollution Control Board. As per Central Pollution Control Board (Ministry of Environment & Forests, Govt. of India), final document on revised classification of Industrial Sectors under Red, Orange, Green and White Categories (29/02/2016).

The newly introduced White category of industries pertains to those industrial sectors which are practically non-polluting such as Biscuit trays etc. from rolled PVC sheet (using automatic vacuum forming machines), Cotton and woollen hosiers making (Dry process only without any dyeing/washing operation), Electric lamp (bulb) and CFL manufacturing by assembling only, Scientific and mathematical instrument manufacturing, Wind power generation through photovoltaic cell, wind power and mini hydel power (less than 25 MW).

There shall be no necessity of obtaining the "Consent to Establish/Operate" for White category of industries. Intimation to concerned SPCB / PCC is sufficient. Being a renewable power project it falls under the category of White and thus these projects do not need clearance for Consent to operate and only needs to inform the relative State pollution control board. The same is done for the project and thus it can be confirmed that it follows the local laws of the host country.

Due to above categorization of white category and being the renewable in nature, the project activity does not emit any emissions. Thus there is no any other surplus regulatory requirement for the project activity. This is found to be accepted by assessment team.

However, of the two alternatives identified, alternative (i) cannot be considered realistic as further analysis in the following paragraph reveals that it is not economically feasible option. Hence, alternative (ii) alone could be justified as realistic, credible and plausible alternative to the PP.

Validation team is, therefore, convinced that the project developer has taken into consideration all realistic and credible alternatives (having regard to the governing methodologies) including the project being undertaken as a non-VCS activity and continuation of current scenario. The identification of alternatives is in conformity with the guidance given by the tool.

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

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

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

Both the alternatives are in compliance with all applicable legal and regulatory requirements as;

- The implementation of project activity is a voluntary initiative and is not mandatory or a legal requirement;
- The applicable environmental regulations do not restrict the use of Wind energy; and
- There is no legal requirement on the choice of a particular technology.

Moreover, Outcome of Sub-step 1b: Hence, both the alternatives enlisted above are found to comply with the mandatory laws and regulations taking into account the enforcement of the legislations in the region

or country and EB decisions on national and/or sectoral policies and regulations. However, Alternative 2 has been selected as the appropriate baseline alternative for this project activity.

Step 2: Investment analysis

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

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

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

Project developer had demonstrated that the financial returns of the proposed VCS project activity would be insufficient to justify the required capital investment as per CDM Validation and Verification Standard for project activities version 02.0. In the Initial Joint VCS PD & MR version 01. PP has adopted a conservative approach to identify the benchmark for the project activity. The project is earning revenue from the installation of the project activity. Thus simple cost analysis (Option I) is not appropriate. Also in the absence of the project activity grid electricity would have been the obvious choice for the Project which requires no investment. Hence investment comparison analysis (Option II) is also not appropriate for the project activity. Therefore, benchmark analysis (Option III) is used for the project activity as per project type and decision-making context. Therefore, the Expected return on equity is considered appropriate benchmark. Accordingly, the post-tax Equity IRR has been considered as the relevant financial indicator for the project activity which is acceptable to the assessment team. Moreover, the financial indicator selected by the PP is correct based on the fact that tool do not restrict the PP to either use project IRR or Equity IRR. This is under the prerogative of the PP to select appropriate indicator based on his preferences to know the IRR based on his equity investment or debt investment. The same is thus acceptable to the assessment team. Assessment team however checked the Equity IRR calculation and found that input assumptions used for the calculation of Equity IRR are applicable at the time of investment decision of the project and thus is in accordance with the relevant guideline of the tool.

The Cost of Equity has been considered using the “Methodological tool: Investment analysis” available at the time of decision making as well as the latest available value. As a conservative approach, the minimum value of benchmark has been considered as calculated using these 2 approaches.

Default Value at the time of investment decision:

Table under Appendix in EB 97 annex 8 specifies default value of expected return on equity in real terms for Energy Industries (Group 1) in India = 10.73%⁸

Default Value as per latest version of Investment Analysis Tool version 10: Table under Appendix in EB 105 annex 06 specifies default value of expected return on equity in real terms for Energy Industries (Group 1) in India = 10.24%⁹

⁸ <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-27-v8.pdf>

Thus, Minimum Default Value considered for calculation of Benchmark = 10.24%

Inflation Forecast for India as per RBI website¹⁰ and corresponding benchmark values:

Project Promoters' Name	Inflation Forecast ¹¹		Benchmark	
	5 Years	10 Years	5 Years	10 Years
Skeiron Renewable Energy Kushtagi Private Limited	4.50%	4.30%	15.20%	14.98%
Saroja Renewables Limited	4.50%	4.30%	15.20%	14.98%
Shanay Renewables Ltd.	4.50%	4.30%	15.20%	14.98%

As a conservative approach, benchmark of 14.98% has been selected for this project activity.

b) Parameters and assumptions used:

The project activity is a renewable source of electricity generation and uses the generated electricity for Sale to grid purpose using Indian National grid. The key parameters which determine the Equity IRR of the project activity are project cost, PLF and profitability estimates.

In the revised Joint VCS PD& MR Version 02, the project cost is based on the DPR (Detailed project report)/Charter accountant certificate. The details of the DPR/ Charter accountant certificate are as below:

Project cost as per the offer letter

Name of the Investor/Owner/SPVs	Project Capacity (MW)	Project Cost (In Million)	Offer Date
Skeiron Renewable Energy Kushtagi Private Limited	50.4 MW	3404.52	27/11/2017
Saroja Renewables Limited	52.5 MW	3546.38	27/11/2017
Shanay Renewables Ltd.	31.5 MW	2127.83	27/11/2017

Actual Project cost as per purchase order:

Name of the Investor/Owner/SPVs	Project Capacity (MW)	Actual Project Cost (In Million)	Purchase Order Date
Skeiron Renewable Energy Kushtagi Private Limited	50.4 MW	3,242.40	02/02/2018

⁹ <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-27-v10.0.pdf>

¹⁰ <https://www.rbi.org.in/Scripts/PublicationsView.aspx?id=18046>

¹¹ Minimum of the two inflation forecasts has been considered.

Saroja Renewables Limited	52.5 MW	3,377.50	27/12/2017
Shanay Renewables Ltd.	31.5 MW	2,026.50	27/12/2017

Offer letter has been submitted to validation team. The Offer letter was available during decision making and financial profitability of the project was decided based on this Offer. Validation team checked the Offer letter of the project activity and found that consideration of the project cost in revised Joint VCS PD& MR Version 02 is correct and it is in line Investment guideline as well as in compliance to CDM Validation and Verification Standard for project activities version 02. Hence, the project cost consideration is justified. Assessment team checked the actual project cost and still the project do not breach the benchmark. The sensitivity analysis below confirms the same. Since the actual cost is considered there is no way the cost can go up and thus the same is assessed to be correct.

In India, infrastructure projects are generally entitled to a debt equity ratio of 70:30. However, depending on the relationship of the client with the bank, its credit rating and collaterals offered, banks consider higher debt equity ratio also. The Debt/equity ratio for all the PP as per Loan Sanction letter is in 70:30 Ratio which is acceptable to the assessment team.

The profitability of the project, which forms the basis for IRR calculation is based on installed capacity, PLF, electricity tariff, O&M cost, depreciation and taxation.

c) Assessment of Plant Load Factor (PLF):

PP considered the Plant load factor from a third party engineering company (M/s AWS True power) for expected electricity generation estimation. They are contracted by the PPs for this project. PP has submitted the copies of the PLFs estimation report to the assessment team.

PLF as per 3rd party PLF report/Feasibility report

Name of the Investor/Owner/SPVs	Project Capacity (MW)	PLF (%)	Date
Skeiron Renewable Energy Kushtagi Private Limited	50.4 MW	27.40%	14/12/2017
Saroja Renewables Limited	52.5 MW	27.60%	14/12/2017
Shanay Renewables Ltd.	31.5 MW	28.00%	14/12/2017

PLF estimation in offer letter is in line with Para 3 (b) Annex 11, EB 48 and acceptable to the assessment team. The deration factor for IRR calculation is sourced from offer letter which was available to the PP at the time of investment decision. Hence the value is considered correct.

D) Assessment of Electricity Tariff:

Tariff rate as per KERC order available at the time of Investment decision

Name of the Investor/Owner/SPVs	Project Capacity (MW)	Tariff Rate as per KERC	KERC Order Date
Skeiron Renewable Energy Kushtagi Private Limited	50.4 MW	3.74	04/09/2017
Saroja Renewables Limited	52.5 MW	3.74	04/09/2017

Shanay Renewables Ltd.	31.5 MW	3.74	04/09/2017
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Tariff rate as per PPA (Power purchase agreement) order available

Name of the Investor/Owner/SPVs	Project Capacity (MW)	PPA Date
Skeiron Renewable Energy Kushtagi Private Limited	50.4 MW	14/12/2017
Saroja Renewables Limited	52.5 MW	14/12/2017
Shanay Renewables Ltd.	31.5 MW	18/12/2017

Validation team assessed the tariff and found that same value was available during decision making and in conformity with Investment guideline. Furthermore, assessment team has also checked the actual tariff as per the PPA for further substantiation as these values are available during the validation stage. IRR is still below benchmark with the consideration of PPA signed which is valid for total operational lifetime of the project.

e) Assessment of O& M cost:

O&M agreement as per the Offer letter

Name of the Investor/Owner/SPVs	Project Capacity (MW)	O&M (In Million)	Offer Date
Skeiron Renewable Energy Kushtagi Private Limited	50.4 MW	70.8	27/11/2017
Saroja Renewables Limited	52.5 MW	73.75	27/11/2017
Shanay Renewables Ltd.	31.5 MW	44.25	27/11/2017

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

Name of the Investor/Owner/SPVs	Project Capacity (MW)	Actual O&M (In Million)	O&M contract Date
Skeiron Renewable Energy Kushtagi Private Limited	50.4 MW	67.97	29/03/2018
Saroja Renewables Limited	52.5 MW	70.80	22/01/2018
Shanay Renewables Ltd.	31.5 MW	42.48	22/01/2018

The Offer letter has been used in the financial calculation as same was available during decision making and hence applicable. According to Investment guideline, the cost should be based on the input parameters available at the time of decision making and the PP has submitted offer letter supporting this consideration. Therefore, considering the above assessment, validation team concluded that the O&M cost considered from respective Offer letter in the computation of financial indicator is in conformity with CDM Validation and Verification standard for project activities, version 02.

F) Assessment of Tax computation:

The project developer has adopted book depreciation rates as per Schedule XIV of the Companies Act, 1956 for computing book profit and Income Tax Act 1961 stipulated for income tax calculation, which are in conformity with the accepted accounting principles adopted by the company and income tax laws in the host country. The block of assets has been computed for depreciation purpose as per the accepted accounting principles. Tax liability has been calculated as per the income tax rules and the rulings given.

In computing the income tax liability, the project developers have considered Tax holiday (u/s 80IA of the Income Tax Act, 1961). Accelerated depreciation on plant and machinery is also sourced from IT act. The tax rates assumed corresponds to the tax rate prevailing at the time of taking decision (conformity to Appendix of EB85, Annex 12). Hence, these assumptions are appropriate during decision making context.

g)Cross checking parameters:

Name of the parameter	DOE assessment																																								
Project Cost	<p>The Project cost has been considered from Offer from WTG Provider and was available at the time decision made for the project activity.</p> <p>IRR value as per the assumptions from the Offer from WTG Provider is as below:</p> <table border="1" data-bbox="363 898 1487 1149"> <thead> <tr> <th>Name of the Investor/Owner/SPVs</th> <th>Project Capacity (MW)</th> <th>Project Cost (In Million)</th> <th>IRR</th> <th>Benchmark</th> </tr> </thead> <tbody> <tr> <td>Skeiron Renewable Energy Kushtagi Private Limited</td> <td>50.4 MW</td> <td>3404.52</td> <td>7.09%</td> <td>14.98%</td> </tr> <tr> <td>Saroja Renewables Limited</td> <td>52.5 MW</td> <td>3546.38</td> <td>7.29%</td> <td>14.98%</td> </tr> <tr> <td>Shanay Renewables Ltd.</td> <td>31.5 MW</td> <td>2127.83</td> <td>7.74%</td> <td>14.98%</td> </tr> </tbody> </table> <p>The assessment team also checked the respective state tariff orders and found that Project Cost considered for project is found to be appropriate.</p> <p>The DOE has also checked the Actual Project Cost for each project and found that IRR values at the actual Project Cost are within threshold limit. Thus, the project activity is still additional with actual Project Cost Value.</p> <table border="1" data-bbox="379 1435 1315 1700"> <thead> <tr> <th>Name of the Investor/Owner/SPVs</th> <th>Project Capacity (MW)</th> <th>Actual Project Cost (In Million)</th> <th>IRR</th> <th>Benchmark</th> </tr> </thead> <tbody> <tr> <td>Skeiron Renewable Energy Kushtagi Private Limited</td> <td>50.4 MW</td> <td>3,242.40</td> <td>8.15%</td> <td>14.98%</td> </tr> <tr> <td>Saroja Renewables Limited</td> <td>52.5 MW</td> <td>3,377.50</td> <td>8.35%</td> <td>14.98%</td> </tr> <tr> <td>Shanay Renewables Ltd.</td> <td>31.5 MW</td> <td>2,026.50</td> <td>8.84%</td> <td>14.98%</td> </tr> </tbody> </table> <p>Based on sectoral scope expert and local knowledge, the project cost considered as per offer letter for the proposed project activity is found to be appropriate for projects. Also, since the Actual Project Cost is available to DOE and IRR is still within benchmark and thus the same is acceptable.</p>	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Project Cost (In Million)	IRR	Benchmark	Skeiron Renewable Energy Kushtagi Private Limited	50.4 MW	3404.52	7.09%	14.98%	Saroja Renewables Limited	52.5 MW	3546.38	7.29%	14.98%	Shanay Renewables Ltd.	31.5 MW	2127.83	7.74%	14.98%	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Actual Project Cost (In Million)	IRR	Benchmark	Skeiron Renewable Energy Kushtagi Private Limited	50.4 MW	3,242.40	8.15%	14.98%	Saroja Renewables Limited	52.5 MW	3,377.50	8.35%	14.98%	Shanay Renewables Ltd.	31.5 MW	2,026.50	8.84%	14.98%
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Sensitivity analysis:

The Guidance on Investment guideline requires the robustness of the conclusion arrived at to be proved through a sensitivity analysis by varying the critical assumptions to a reasonable variation. The project developer has identified Plant Load Factor (PLF), Project cost, Electricity tariff and O&M cost as critical assumptions. These critical parameters constitute more than 20% of either total project costs or total project revenues. The sensitivity analysis reveals that even under more favourable conditions, the IRR without CDM revenue would not cross the benchmark return as given in the following table:

Skeiron Renewable Energy Kushtagi Private Limited

Variation %	-10%	Normal	10%	Variation required to reach benchmark
PLF	4.43%	7.09%	9.81%	35.00%
O&M	7.69%	7.09%	6.48%	-152.71%
Project Cost	9.47%	7.09%	5.24%	-25.69%
Tariff Rate	4.43%	7.09%	9.81%	28.19%

Saroja Renewables Limited

Variation %	-10%	Normal	10%	Variation required to reach benchmark
PLF	4.61%	7.29%	10.03%	27.26%
O&M	7.88%	7.29%	6.68%	-148.76%
Project Cost	9.70%	7.29%	5.42%	-25.03%
Tariff Rate	4.61%	7.29%	10.03%	27.26%

Shanay Renewables Ltd.

Variation %	-10%	Normal	10%	Variation required to reach benchmark
PLF	5.00%	7.74%	10.54%	25.15%
O&M	8.33%	7.74%	7.14%	-139.17%
Project Cost	10.22%	7.74%	5.81%	-23.49%
Tariff Rate	5.00%	7.74%	10.54%	25.15%

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.

Probability to breach the benchmark:
Sensitivity Parameter 1 : PLF
PLF considered in financials is as per “ Guidelines for the reporting and validation of Plant load factors ” stated in EB48 Annex11 ¹² .
Variation in PLF of more than 10% is unlikely to happen as the PLF has been reported as per the Third-Party Report based.
Sensitivity Parameter 2 : O&M
The sensitivity analysis reveals that O&M will breach the benchmark at negative values and is hypothetical case. Since the O&M cost is subject to escalation (as evidence by the O&M agreement) and also subject to inflationary pressure, any reduction in the O&M costs is highly unlikely. Hence, the reduction in the O&M cost is highly unlikely.
Sensitivity Parameter 3 : Project Cost
Estimated Project Cost for financial analysis is considered from Offer Letter. However, even if we consider the actual cost of the project even then the benchmark is not breached. Moreover, the Sensitivity is carried out for +/-10%.
Sensitivity Parameter 4 : Tariff Rate
Tariff Rate is considered as per the latest Tariff Order available at the time of investment decision and the Tariff Rate as per PPA is same as available at the time of investment decision and is fixed for the entire life of the Project. However, Sensitivity is carried out for +/-10% variation in the tariff. Even then the benchmark is not breached.
Hence, there is no probability of variation for the same.

Assessment team also confirmed the breaching values for individual parameters (=project participant) and thus confirms that the project is still additional

Name of the Investor/Owner/SPVs	Project Capacity (MW)	Project Cost as per Offer	Actual Project Cost	Variation in Project Cost	Breaching Value
Skeiron Renewable Energy Kushtagi Private Limited	50.4 MW	3404.52	3,242.40	-4.76%	-23.49%
Saroja Renewables Limited	52.5 MW	3546.38	3,377.50	-4.76%	-25.03%
Shanay Renewables Ltd.	31.5 MW	2127.83	2,026.50	-4.76%	-23.49%

Name of the Investor/Owner/SPVs	Project Capacity (MW)	O&M Cost as per Offer	Actual O&M Cost	Variation in O&M Cost	Breaching Value
Skeiron Renewable Energy	50.4 MW	70.8	67.97	-4.00%	-139.17%

¹²http://cdm.unfccc.int/EB/048/eb48_repan11.pdf

Kushtagi Private Limited					
Saroja Renewables Limited	52.5 MW	73.75	70.80	-4.00%	-148.76%
Shanay Renewables Ltd.	31.5 MW	44.25	42.48	-4.00%	-139.17%

Name of the Investor/Owner/SPVs	Project Capacity (MW)	Tariff Rate as per KERC	Actual Tariff Rate from Electricity Bill	Variation in Tariff Rate	Breaching Value
Skeiron Renewable Energy Kushtagi Private Limited	50.4 MW	3.74	3.74	0%	25.15%
Saroja Renewables Limited	52.5 MW	3.74	3.74	0%	27.26%
Shanay Renewables Ltd.	31.5 MW	3.74	3.74	0%	25.15%

Name of the Investor/Owner/SPVs	Project Capacity (MW)	PLF as per TPR	PLF as per JMR	Variation in PLF	Breaching Value
Skeiron Renewable Energy Kushtagi Private Limited	50.4 MW	27.40%	34.67%	26.53%	25.15%
Saroja Renewables Limited	52.5 MW	27.60%	31.98%	15.87%	27.26%
Shanay Renewables Ltd.	31.5 MW	28.00%	31.37%	12.04%	25.15%

Common Practice analysis:

The common practice analysis is proved by following points as per the requirement of Methodological tool “Common Practice”, version 03.1 EB84, Annex 7¹³:

1. Applicable Geographical Area (Para 9): The Karnataka state has been considered as the applicable geographical area for this project. PP had considered the state Karnataka as geographical area due to regulatory regime since applicable power tariff structure for renewable energy projects is unique for all the states across national boundary of India; which is based on Electricity Act 2003 (EA 2003), section 82 which clearly mentions “Every State Government shall, within six months from the appointed date, by notification, constitute for the purposes of this Act, a Commission for the State to be known as the (name of the State) Electricity Regulatory Commission” Appropriateness of the same has been checked and confirmed from EA 2003 (<http://www.cercind.gov.in/08022007/Act-with-amendment.pdf/40>).

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

- Electricity Act 2003 (EA 2003) has changed the legal and regulatory framework for the renewable energy sector in India. The EA 2003 mandates policy formulation to promote renewable sources of energy by the federal government, the State governments and the State Electricity Regulatory Commissions (=SERCs) within their jurisdictions.

¹³<https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-24-v1.pdf>

- The Electricity Act 2003 introduced some enabling provisions conducive to accelerated development of grid connected renewable energy sources. Under Section 61(h), promotion of cogeneration and generation of electricity from renewable sources of energy has been made the explicit responsibility of SERCs, which are bound by law to take these considerations into account while drafting their terms and conditions for tariff regulations. Nearly all SERCs have issued their tariff regulations incorporating suitable clauses, which will enable them to provide a preferential treatment to renewable energy (RE) during the tariff determination process. The SERCs determine the tariff for all renewable energy projects across the States, and the state-owned power Distribution Companies (DISCOMs) ensure grid connectivity to the renewable energy project sites.
- EA 2003 has initiated the adoption of the National Tariff Policy, 2006 as one of the key policies, National Tariff Policy (2006) framed under the Section 3 of the EA 2003. As per the excerpt from National Tariff Policy, 2006; pursuant to provisions of section 86(1)(e) of the EA 2003, the Appropriate Commission shall fix a minimum percentage for purchase of energy from such sources taking into account availability of such resources in the region and its impact on retail tariffs. Such percentage for purchase of energy should be made applicable for the tariffs to be determined by the SERCs latest by 01/04/2006.
- As mandated under section 86(1)(e) of the Electricity Act (2003), by 26/06/2012 SERCs had fixed quotas (in terms of % of electricity being handled by the power utility) to procure power from renewable energy sources. The mandate, which is called a Renewable Purchase Specification (RPS), varies from 0.5% to 14% in various states over varying time-scales. Few states have come out with technology specific RPSs. Besides, the state regulators determine the tariff for all RE projects in the states and ensure connectivity to the grid through extension of power evacuation from the RE project sites.
- At present thirteen SERCs have declared preferential feed-in tariffs (FITs) for purchase of electricity generated from Wind power projects established in respective states, which varies from state to state in India. All the SERCs have adopted a 'cost plus' methodology to fix the feed-in tariff, which varies across the states depending upon the state resources, project cost and more importantly the tariff regulations of SERCs. Wind power related tariff policies in different states also has difference in regulatory and policy incentives. Several states have implemented fiscal and financial incentives for renewable energy generation, including; energy buy back (i.e. a guarantee from an electricity company that they will buy the renewable power produced); preferential grid connection and transportation charges and electricity tax exemptions.

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

Thus, the specific geographical area i.e. state of Karnataka for the common practice analysis of the proposed project activity is considered and thus the same is acceptable to the assessment team.

2. Measure (Para 10): The project activity reduces greenhouse gas emissions by generating electricity using renewable energy source- Wind. Therefore, the project activity falls under the following measure:

(b) Switch of technology with or without change of energy source including energy efficiency improvement as well as use of renewable energies.

3. Output (Para 11): The project activity produces electricity. Therefore, electricity is considered as output of the project activity.
4. Different Technologies (Para 12): The project activity uses Wind energy for producing electricity and hence as per Para 12(a), the technologies which use energy source/ fuel other than Wind will be considered as the different technologies for the project activity.

For the concerned project activity, Common Practice Analysis has been carried out for 134.4 MW capacity Wind Power Project at Karnataka.

Stepwise approach for common practice analysis has been carried out as per Methodological tool “Common Practice”, version 03.1 EB84, Annex 7:

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%	201.60	MW
Capacity of the proposed project activity	134.4	MW
-50%	67.20	MW

Since the project activity is 134.4 MW, the output range of +/- 50% has been considered as 201.6 MWp (Higher range for comparison) to 67.20 MWp (Lower range for Comparison) which is assessed to be correct.

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

- (a) The projects are located in the applicable geographical area;
- (b) The projects apply the same measure as the proposed project activity;
- (c) 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;
- (d) 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;
- (e) The capacity or output of the projects is within the applicable capacity or output range calculated in Step 1;
- (f) 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:

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

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

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

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

e) Since the project activity is 134.4 MW, the output range of +/- 50% has been considered as 201.6 MWp (Higher range for comparison) to 67.20 MWp (Lower range for Comparison) which is assessed to be correct.

f) The start date of the project activity is 02/03/2018. Therefore projects, which have started commercial operation before 02/03/2018, have been considered for analysis. Numbers of Similar projects (CDM and non-CDM) identified, which fulfil above-mentioned conditioned are:

Particulars	No. of Projects	Source checked by DOE
N_{Wind}	1	Directory, India Wind-power 2017, 17th Edition

Sources: Directory, India Wind-power 2017, 17th Edition

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} .

Out of the projects identified in step-2, 7 projects are either registered or project activities submitted for registration, or project activities undergoing validation.

Thus $N_{all} = 1$

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

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

1. Size of Installation – Assessment team confirms that as the proposed project activity is a large scale project and applies large scale methodology i.e. AMC002 therefore **small scale projects** i.e. with capacity below or equal to 15 MW are considered as different projects.
2. Investment climate on the date of the investment decision – Since the project activity is located in Karnataka and has signed Power Purchase Agreement (PPA) with respective Discom which is wholly owned by the Government of Karnataka. The policies and tariff are regulated/governed by the respective Karnataka Electricity Regulatory Commission. So, projects in Karnataka that have been allocated through bidding process and have PPA with NTPC can be assumed that such projects are governed by different investment climate. Therefore, these projects come under different investment climate and have been considered under Ndiff

Hence, projects where either of the conditions is satisfied those projects are counted for calculating Ndiff projects.

Thus, As $N_{all} = 1$; 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 $F = 1 - N_{diff}/N_{all}$

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

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

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

Outcome of Common Practise analysis:

As,

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

The project activity does not satisfy second condition. Hence, project activity is not a common practice. The above discussions show that Wind power development is not a common practice and the project activity is not financially attractive; hence the project activity is additional and the assessment team considers the approach and calculations acceptable as per the requirements in the methodological tool.

3.3.6 Quantification of GHG Emission Reductions and Removals

Assessment team checked the baseline, project and leakage calculation and confirm that the evaluation of baseline, project and leakage is as per the approved methodology and formula used to calculate the same is correct. The detail analysis is as below:

Baseline Emission:

As per the approved consolidated Methodology ACM0002 version 19.0:

Baseline emissions include only CO₂ emissions from electricity generation in fossil fuel fired 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:

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

Where:

BE_y = Baseline emissions in year y (t CO₂/yr)

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

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

The grid emission factor is calculated as the weighted average of the operating margin (0.75) & builds margin (0.25) values. The value of combined margin is sourced from Baseline CO₂ Emission Database, Version 14 published by Central Electricity Authority (CEA), Government of India. CEA calculates the data based on Tool to Calculate the Emission Factor for an Electricity System”, Ver. 7.0. No further assessment is required for grid emission calculation as the ex-ante value is sourced directly from the Govt. of India database.

EG_{PJ,y} is calculated based on capacity (Checked from the manufacturer specification), PLF= sourced from 3rd party DPR thus fulfilling the requirement of Para 3 (b), Annex 11 EB 48 and 8760 (365*24) annual hours. The estimation is thus considered appropriate. Moreover, EG_{PJ,y} is a monitoring parameter and the actual value will be obtained during the verification of the project activity.

The detail for EG_{PJ,y} (134.4 MW)is provided below:

PPs	Capacity (MW)	PLF	Generation (MWh)
Skeiron Renewable Energy Kushtagi Private Limited	50.4	30.10%	50.4*30.1*8760= 132892.704
Saroja Renewables Limited	52.5	30.40%	52.5*30.4*8760= 139809.6
Shanay Renewables Ltd.	31.5	30.80%	31.5*30.8*8760= 84989.52
Total	134.4		357,692

$$EG_{PJ,y} = 357,692 \text{ MWh (Total for the project activity)}$$

The detail for EG_{PJ,y} (107.1 MW)is provided below

PPs	Capacity (MW)	PLF	Generation (MWh)
Skerion Renewable Energy Kushtagi Private Limited	50.4	30.10%	50.4*30.1*8760= 132893
Saroja Renewables Limited	35.7	30.40%	35.7*30.4*8760= 95071
Shanay Renewables Ltd.	21	30.80%	21*30.8*8760= 56660
Total	107.1		284623

$$EG_{PJ,y} = 284,623 \text{ MWh}$$

Emission factor (EF_y):

EF_y = EF_{grid,CM,y} = 0.9368 tCO₂/MWh. This value is fixed ex-ante for the crediting period.

$$BE_y = 357,692 \times 0.9368 = 335,085 \text{ tCO}_2\text{e (for 134.4 MW)}$$

$$BE_y = 284,623 \times 0.9368 = 266,634 \text{ tCO}_2 \text{ (for 107.1 MW)}$$

Project Emission:

As per the approved consolidated ACM0002 version 19.0: "For most renewable energy 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 as project emissions by using the following equation:

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

Where:

PE_y = Project emissions in year y (t CO₂e/yr)

PE_{FF,y} = Project emissions from fossil fuel consumption in year y (t CO₂/yr)

PE_{GP,y} = Project emissions from the operation of dry, flash steam or binary geothermal power plants in year y (t CO₂e/yr)

PE_{HP,y} = Project emissions from water reservoirs of hydro power plants in year y (t CO₂e/yr)

The detail is as follows:

PE_{FF,y} = Project emissions from fossil fuel consumption in year y (t CO₂/yr) = The project utilizes renewable fuel and thus there is no Consumption of fossil fuel envisaged for the project activity. Thus the parameter is considered zero for project emission calculation.

PE_{GP,y} = Project emissions from the operation of dry, flash steam or binary geothermal power plants in year y (t CO₂e/yr) = This parameter is not applicable as the proposed project is wind power project and hence considered zero for project emission calculation.

$PE_{HP,y}$ = Project emissions from water reservoirs of hydro power plants in year y (t CO₂e/yr)= This parameter is not applicable as the proposed project is wind power project and hence considered zero for project emission calculation.

As the project activity is the installation of a new grid-connected wind Power plant and does not involve any project emissions from fossil fuel, operation of dry, flash steam or binary geothermal power plants, and from water reservoirs of hydro power plants. Therefore $PE_{FF,y}$, $PE_{GP,y}$, $PE_{HP,y}$ are equal to zero and thus, $PE_y = 0$.

Leakage Emission:

Leakage emission is not applicable as per the requirement of ACM0002 version 19.0.

Net Emission reduction:

Reductions are calculated as follows:

$$ER_y = BE_y - PE_y$$

Where:

ER_y	=	Emission reductions in year y (t CO ₂ e/yr)
BE_y	=	Baseline emissions in year y (t CO ₂ /yr)
PE_y	=	Project emissions in year y (t CO ₂ e/yr)

Therefore, Net GHG Emission Reductions and Removals are calculated as follows:

$$ER_y = BE_y - PE_y = 335,086 - 0 = 335,085 \text{ tCO}_2 \text{ (For 134.4 MW)}$$

$$ER_y = BE_y - PE_y = 266,634 \text{ tCO}_2 \text{ (for 107.1 MW)}$$

The detail calculation is checked in the estimated ER sheet and a complete summary is provided below:

For 134.4 MW

Year	Estimated baseline emissions or removals (tCO ₂ e)	Estimated project emissions or removals (tCO ₂ e)	Estimated leakage emissions (tCO ₂ e)	Estimated net GHG emission reductions or removals (tCO ₂ e)
Year 1	335,085	0	0	335,085
Year 2	335,085	0	0	335,085
Year 3	335,085	0	0	335,085
Year 4	335,085	0	0	335,085

Year 5	335,085	0	0	335,085
Year 6	335,085	0	0	335,085
Year 7	335,085	0	0	335,085
Year 8	335,085	0	0	335,085
Year 9	335,085	0	0	335,085
Year 10	335,085	0	0	335,085
Total	3,350,850	0	0	3,350,850

For 107.1 MW

Year	Estimated baseline emissions or removals (tCO ₂ e)	Estimated project emissions or removals (tCO ₂ e)	Estimated leakage emissions (tCO ₂ e)	Estimated net GHG emission reductions or removals (tCO ₂ e)
Year 1	266,634	0	0	266,634
Year 2	266,634	0	0	266,634
Year 3	266,634	0	0	266,634
Year 4	266,634	0	0	266,634
Year 5	266,634	0	0	266,634
Year 6	266,634	0	0	266,634
Year 7	266,634	0	0	266,634
Year 8		0	0	

	266,634			266,634
Year 9	266,634	0	0	266,634
Year 10	266,634	0	0	266,634
Total	2,666,340	0	0	2,666,340

3.3.7 Methodology Deviations

Assessment team confirms that No methodology deviation is applicable for the present project activity.

3.3.8 Monitoring Plan

Assessment team checked the monitoring practice onsite and also checked the guideline of respective State electricity regulatory commission. The detail analysis is as below:

Parameters determined ex-ante:

Baseline emission factor of INDIAN Grid is establish ex-ante based on Tool to calculate the grid emission factor, using a combined approach consisting 75 % operating margin and 25 % build margin. The emission coefficient from official data published in Central Electricity Authority (CEA) CO₂ Baseline database available to the project participant at the time of submission of joint VCS PD & MR for joint validation & Verification and global stakeholder’s consultation process. CEA is an official source of Ministry of Power, Government of India have worked out baseline as CO₂ baseline database. The assumption were verified by the validation team and found to be correct.

Parameters determined ex-post:

The parameters monitored ex-post involves net electricity supplied to the grid (calculated from electricity exported and imported and Transmission loss) to the INDIAN grid by the project activity.

As per the Joint VCS PD & MR Version 02, Form B issued by State Electricity Board is the primary source of data for export, Import and Transmission loss. The DOE will use the same source for verification of emission reductions.

In accordance with the methodology requirement, Net electricity supplied by the project activity (As the project is sale to Grid) is obtained from Form B Statments signed by PP as well as O&M partner (used for calculation of EG_{PJ,y} by the project activity and forms the basis for emission reduction calculation. Electricity export to the grid and import from the grid is metered by main and check tri-vector energy meters at both the site of the project. The main meter reading is taken jointly on a fixed day of every month for the preceding month at the delivery point and signed by the representatives of PP and O&M personnel.

Net electricity exported= Export-115%Import- Transmission loss

Form B contains the Value export, Import and Transmission loss and the same is provided by the State electricity board to Individual PP. The Calculation of Net electricity supplied to the grid is done by State electricity Board and PP has no role to play in it.

In the event of failure of main meter, the check meter will be used in monitoring the electricity data. The agency is experienced in the monitoring system and is managing O&M of numerous other wind projects. The validation team therefore is of the opinion that the project participant through the O&M agency is capable of implementing the monitoring plan in the context of the project activity. The monthly electricity supplied by the project activity in the JMR report is cross checked with Invoices raised to the state electricity board. The same approach is used for present verification and will also be considered for the subsequent verifications.

Calibration of all the meters is done by state electricity board officials as per the industry standards. However, the calibration will be done once in a 5 year¹⁴ for all the project activity. The energy meter recording the export and import from the grid at substation is under the control and supervision of state electricity board officials. Similarly O&M contractor is responsible for monitoring of the generation data at CMS.

It is reported that the data will be kept for 2 years following the end of the crediting period or till the last issuance of VERs for the project activity whichever occurs later.

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

3.4 Non-Permanence Risk Analysis

Not applicable for the present project activity.

4 SAFEGUARDS

4.1 No Net Harm

The project activity promotes environmental and socio-economic well-being as it results in zero GHG emissions due to installation and operation of clean, renewable energy technology for electricity generation.

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

S. No.	Indicator	Assessment team opinion
1	Air quality	The project generates clean energy which replaces the fossil fuel intensive electricity generation. Also report on "Developmental Impacts and Sustainable Governance Aspects of Renewable Energy Projects" prepared by MNRE dated September 2013. This report clearly mentioned that Wind farms operations do not result in direct air pollution. Adequate measures were taken to mitigate the envisaged impacts like spraying

¹⁴http://powermin.nic.in/whats_new/pdf/Metering_Regulations.pdf, page 12

S. No.	Indicator	Assessment team opinion
		water on the road side to reduce dust level, etc. This was confirmed by the local stakeholders. Therefore, it is validated that mitigation measures were robustly implemented on ground for air quality issues project will have a positive impact on air quality.
2	Water quality and quantity	The project has no effect on water quality and quantity because it neither generates any waste nor consumes any water. It was validated during on-site assessment that there was no requirement of water for operations of Wind plant and the only usage of water was for drinking and sanitation purposes. The consumption of freshwater during construction was also pretty much limited as confirmed by the local stakeholders. Hence the parameter is indicated as neutral and the same is acceptable to the DOE
3	Soil condition	There are negligible impacts envisaged during operation of the project activity. For mitigating the impacts during construction, various mitigation measures were taken which is validated from the plant records of PP and the interview with local villagers. The top soil excavated during construction, was stockpiled and used for compaction. The roads were not paved and soling was done with excavated earth & rock material, so land disturbance could be minimized. It was also confirmed that, the vegetation done at site helps for soil erosion. The same is confirmed during the stakeholder meetings during on-site visit. Therefore, it can be concluded that the project has no effect on soil conditions during its operation because it has no waste coming out.
4	Biodiversity	During the validation site visit it was observed that the condition of ground vegetation will be gradually improved; No rare species has been found in the around area. The project site is not on the migration route of migratory birds. As such Wind power plant does not have any obstruction in the path of migratory birds. With the implementation of Project, the greening water will be increased significantly; the biodiversity in the vicinity will be improved with the vegetation improvement. NO negative impact envisaged.
5	Employment Generation	The project activity employed local population as skilled workers as well as security guards which were envisaged during the validation site visit. The personnel employed by the project activity are also provided trainings and exposed to various awareness programs therefore a positive indicator has been accepted.
6	Livelihood of the poor	The project is associated with infrastructure development like roads in the nearby areas and promoting economic activities like grants to local school and communities temples etc. Positive impact envisaged.

4.2 Environmental Impact

The project activity is expected to have positive impacts and no significant adverse environmental impacts are foreseen. Since, the project activity is an electricity generation from renewable source (i.e.

Wind energy) therefore no negative impact are envisaged. There is no mandatory legal requirement for carrying out an environmental impact assessment in the host country. The Ministry of Environment, Forests & Climate change (MoEF), Government of India (GoI) notification¹⁵ dated 14/09/2006 regarding the requirement of Environment Impact Assessment (EIA) studies states that any project developer in India needs to file an application to the Ministry of Environment and Forests (including a public hearing and an EIA) in case the proposed industry or project is listed in a predefined list. The list includes thirty nine project activities that require EIA studies. The Wind power projects are not included in this list and thus an EIA study is not required.

4.3 Local Stakeholder Consultation

As per the VCS requirements, it is necessary to invite the relevant stakeholders, prior of the validation process.

The Local Stakeholder Meetings were organized for the local stakeholder consultation and the local stakeholders were informed regarding the meeting by means of Public Notice. The details are mentioned below.

SI No.	Project Detail	Place / Location of Project activity	Meeting Date	Date of Invitation
1	Bundled Wind Power project in Koppal Karnataka	Bagalkot district Karnataka (The stakeholders from both the district i.e. Bagalkot and Koppal district were invited in Bagalkot district wind site for stakeholder consultation meetings)	25/01/2018	20/01/2018

All the stakeholders have been invited through public notice to attend the stakeholders meeting. The local stakeholders' consultation meeting was attended by local persons including local villagers, local vendors and technology suppliers. As per the requirement CDM validation and Verification standard for project activities version 02 Local stakeholder meeting is conducted before the start date of the project activity which is acceptable to the assessment team.

The stakeholders identified by the project participant were local villagers who are the major population of the particular area, local communities and gram panchayat (Village head), panel supplier, project proponent representatives, O&M Team and other people involved in the project. Validation team verified the list of participants who attended the stakeholder meeting and feedback questionnaire and confirms the stakeholders identified are relevant. Validation team verified the list of participants who attended the stakeholder meeting and feedback questionnaire and confirms the stakeholders identified are relevant. The validation team also verified the minutes of meeting to note that no negative comments were received and the same was cross checked with the information obtained during follow up interviews with the stakeholder's. Moreover, assessment team during the validation site visit also noted that a grievance register/cell is also put onsite for the stakeholder to comment on any grievances during the operation lifetime of the project activity, The grievances from the stakeholder if found suitable will be addressed immediately by the top management and thus the approach is found appropriate for the project activity.

The interactions with some of the stakeholders during the site visit are presented below:

Name of the stakeholder	Koppal District: Pingali Venkyaga
DOE questions: Did the Wind power plant have any adverse impact on the nearby areas?	
Answer: NO. Wind plant has no adverse impact on surrounding area.	
DOE questions: Did the plant have impact on any crop fields?	

¹⁵<http://envfor.nic.in/legis/eia/so1533.pdf>

Answer: The plant is implemented in barren land and there were no any fertile land or crop which is damaged.

Name of the stakeholder	Bagalkot district: N. G Ranga
DOE questions: Did the power project generated employment opportunities for locals?	
Answer: Yes. Employment given to locals in O&M activities for technically educated persons and unskilled labors in construction & related work.	

Thus Validation team is of the opinion that the stakeholder meeting was adequate and appropriate.

4.4 Public Comments

Assessment team noted that this project was open for public comment from 13/11/2019 to 13/12/2019. No comments were received.

The detail were checked by the assessment team in the following web platform

https://www.vcsprojectdatabase.org/#/pipeline_details/PL1993

5 VERIFICATION FINDINGS

5.1 Accuracy of GHG Emission Reduction and Removal Calculations

Means of verification	The verification team assessed whether the data and calculations of GHG emission reductions achieved resulting from the Joint VCS PD & MR. The verification team has checked whether calculations of baseline GHG emissions, project GHG emissions and leakage GHG emissions have been carried out in accordance with the formulae and methods described in the monitoring plan of the Joint VCS PD & MR.
Findings	CAR 07 & CAR 08 raised on this section and closed successfully. Please refer Appendix 2 for further details
Conclusion	<p>The baseline Emissions for a given year is calculated by multiplying the energy baseline (EB) with the regional grid emission factor. The grid in this case would be the 'INDIAN Grid'</p> <p>Formula Used:-</p> $BE_y = EG_{PJ,y} \times EF_{grid,CM,y}$ <p>Where:</p> <p>BE_y = Baseline emissions in year y (t CO₂/yr)</p> <p>$EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh/yr)</p> <p>$EF_{grid,CM,y}$ = 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)</p> <p>The verification team has checked the entire monthly JMR report and daily log sheets applicable for the monitoring period as per the project activity applied for verifications and found all the parameters are monitored and recorded as per the monitoring plan in the Joint VCS PD & MR. The verification team has</p>

	crosschecked the emission reduction sheet and monitoring report data with the JMR sheet and daily log generation sheet as derived from the online CMS (= Central Monitoring system) and found all the values are matching.
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5.2 Quality of Evidence to Determine GHG Emission Reductions and Removals

Means of verification	The verification team checked the break down log for the monitoring period. During the verification site visit the feeder wise location of the Wind plants is also checked. The Calibration details of the monitoring meters are also checked with calibration certificates.
Findings	CAR 09 is raised during the verification process and closed successfully. Please refer Appendix 2 for further details
Conclusion	<p>The metering arrangement is tri-vector bi-directional energy meters (main and check) at the pooling station in the plant premises. These meters record several parameters including electricity exported & imported. Moreover, the meters are located at the HT side of the transformer and are of accuracy class of 0.2s for each site of the project activity applied for verification.</p> <p>These electricity meters are being used for Form-B statement preparation by state electricity board. The Net electricity supplied to the grid is then calculated from export and import values and transmission loss. The net electricity exported to the grid is also cross checked from the invoices raised by PP to state electricity board. Hence assessment team confirmed that the value of net electricity exported to the grid as used in emission reduction calculation is correct.</p> <p>Electricity export to the grid and import from the grid is metered by main and check tri-vector energy meters. The main meter reading is taken jointly on a fixed day of every month for the preceding month at the delivery point and signed by the representatives of PP and O&M personnel. In the event of failure of main meter, the check meter will be used in monitoring the electricity data. The agency is experienced in the monitoring system and is managing O&M of numerous other Wind farm projects. The assessment team therefore is of the opinion that the project participant through the O&M agency is capable of implementing the monitoring plan in the context of the project activity.</p> <p>Calibration of all the meters is done as per the industry standards. However, the calibration is done once in a 5 year¹⁶. The details of Calibration of the meters are mentioned in Appendix 5 of this report.</p> <p>It is reported that the data will be kept for 2 years following the end of the crediting period or till the last issuance of VERs for the project activity whichever occurs later.</p> <p>The responsibilities and authorities of project management, data handling and recording, measurement methods and QA/QC procedure have been systematically established and formalized and the same was verified during the site visit.</p> <p>On-site visit and interview with O&M personnel also confirms that the operational and organizational chart as mentioned in Joint VCS PD & MR is as per the site practice and thus assessment team confirms that the details are correct.</p>

¹⁶http://powermin.nic.in/whats_new/pdf/Metering_Regulations.pdf, page 12

	The break down log is checked and found that the plant undergone scheduled maintenance and break down. No unforced error observed for the monitoring period. Moreover, feeder details is now mentioned correctly in the revised joint PD and MR. Section 6 of the joint PD and MR is also corrected now as a part of CAR 09 and found appropriate by the assessment team.
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6 VALIDATION AND VERIFICATION CONCLUSION

LGAI Technological Center S.A. (Hereinafter referred as Applus+ Certification) has been appointed by “Skeiron Renewable Energy Kushtagi Private Limited”, “Saroja Renewables Limited”, “Shanay Renewables Ltd.” to perform the validation and verification of the project entitled under VCS standard and guideline version 3.7. The objective of this joint validation & verification activity is to have an independent third party for the assessment of the project design, ER sheet and to ensure a thorough assessment of the proposed project activity against the applicable CDM and VCS requirements.

The management of the project participant/owner is responsible for the preparation of the GHG emissions data and the reported/estimated GHG emissions reductions on the basis set out within the project’s Monitoring Plan in the Joint VCS PD & MR and the approved methodology ACM0002 version 19.0.

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

- The projects description compliance with, the requirements of Article 12 of the Kyoto Protocol, the CDM Modalities and Procedures as agreed in the Marrakech Accords under decision 3/CMP.1, the annexes to this decision, subsequent decisions and guidance made by COP/MOP & CDM Executive Board and other relevant rules, including the Host Country legislation and sustainability criteria along with VCS guideline and standard version 3.7
- The project's baseline and additionality is assessed against “ACM0002 version 19.0 for large scale project
- The project’s monitoring plan is assessed against “ACM0002 version 19.0 for large scale project
- A risk based approach has been followed to perform this validation activity. The review of the project description and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews with Project Owner have provided LGAI Technological Center S.A. (Applus+ Certification) with sufficient evidence for positive validation opinion as per the requirement of VCS.

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

- the project is operated as planned and described in the project document;
- the monitoring plan is as per the applied methodology;

- the monitoring process in Monitoring Report is as per the PD
- the development and maintenance of records and reporting procedures are in accordance with the monitoring plan;
- the installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately
- the monitoring system is in place and generates GHG emission reductions data;
- the GHG emission reductions are calculated without material misstatements.
- No limitation observed for the present verification

Verification period: 20/03/2019 to 30/09/2019 (first and last date included)

Verified GHG emission reductions (Vintage wise) and removals in the above verification period:

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
2018	215,723	0	0	215,723
2019	245,310	0	0	245,310
Total	461,033	0	0	461,033

Parameters	tCO2e		
1. Estimated Annual Emission Reduction per year for 134.4MW	335,085		
2. Estimated Annual Emission Reduction per year for 107.1 MW (already commissioned)	266,634		
Estimated Emission Reductions for the monitoring period for 107.1 MW (578 days)	422,231		
Emission reductions achieved in monitoring period	461,033		
Percentage of variation when compared with estimated ERs	9.19%		
	Skeiron	Shanay	Saroja
Actual PLF	34.67%	31.37%	31.98%
Estimated PLF	30.10%	30.80%	30.40%

The actual emission reductions for the current monitoring period are 9.19% higher than the estimated values in the registered VCS PD corresponding to the similar period. However assessment team checked the IRR and found that increase of 9.19% does not affect the additionality of the project. The details are as below

Name of the Investor/Owner/SPVs	Actual PLF (%)	IRR	Benchmark
Skeiron Renewable Energy Kushtagi Private Limited	34.67%	14.49%	14.98%
Saroja Renewables Limited	31.98%	11.67%	14.98%
Shanay Renewables Ltd.	31.37%	11.12%	14.98%

Therefore with increase on actual Value the project still remain additional. Moreover, this is 1st periodic verification and assessment team do not have historical data to prove that the increase is Continuous. Moreover, the comparison is done with the actual commissioned capacity and since the increase do not affect the additionality the same is acceptable to the assessment team.

APPENDIX 1: DOCUMENTS REVIEWED DURING VALIDATION AND VERIFICATION

No.	Author	Title	References to the document	Provider
1.	NA	Commissioning certificates	Commissioning certificates of the Wind panels.	Project participant
2.	NA	Contract of the other entity with the DOE	Contract of the other entity with the DOE	Project participant
3.	NA	Technical specifications	Technical specifications of wind power plants from manufacturers	Project participant
4.	NA	Draft Joint VCS PD&MR Version 01 Revised Joint VCS PD&MR Version 02	30/10/2019 17/12/2019	Project participant
5.	NA	Estimated Emission Calculation sheet- Version 01	17/12/2019	Project participant
6.	NA	Actual Emission Calculation sheet- version 01 - Actual	17/12/2019	Project participant
7.	NA	IRR calculation sheet Ver-01- Skeiron Renewable Energy Kushtagi Private Limited Saroja Renewables Limited Shanay Renewables Ltd.	17/12/2019	Project participant
8.	NA	The operational lifetime of the project activity from the manufacturer = (Technical specifications)	Manufacturer technical specifications	Project participant
9.	NA	Reference link is provided.	KERC order https://www.karnataka.gov.in/kercc/Pages/home.aspx RBI: Reserve Bank of India www.rbi.org.in Ministry of Environment and forest: www.envfor.nic.in UNFCCC www.cdm.unfccc.int CEA: Central electricity authority www.cea.nic.in Income tax act 1961	Independent Search

No.	Author	Title	References to the document	Provider
			http://law.incometaxindia.gov.in/DIT/ VCS: Verified Carbon Standard www.v-c-s.org	
10.	NA	Tools/ guidelines used in the project activity	UNFCCC CDM web site <ul style="list-style-type: none"> • Tool to calculate the emission factor for an electricity system version 07 • Grid-connected electricity generation from renewable sources ACM0002-Version 19.0 • Glossary of CDM terms version 07 • VCS joint validation and verification report template Version 3.1 • Tool for the demonstration and assessment of additionality version 07 	UNFCCC
11.	NA	Calibration details of the project activity undergoing verification	Please refer to Appendix 5	Project participant
12.	NA	Offer letters/PLF	Offer letters /PLF reports for Individual project owners	Project participant
13.	NA	JMR records+ Daily Log generation sheets for the complete monitoring period	JMR records+ Daily Log generation sheets for the respective states	Project participant
14.	NA	Actual O&M agreement	O&M agreements for all sites	Project participant
15.	NA	VCS Declaration	Declaration from PP for Participation under Other GHG Programs dated 24/11/2019	Project participant
16.	NA	MNRE guideline	“Developmental Impacts and Sustainable Governance Aspects of Renewable Energy Projects” prepared by MNRE (The Ministry of New and Renewable Energy) dated September 2013	Project participant

APPENDIX 2: CLARIFICATION REQUESTS, CORRECTIVE ACTION REQUESTS, FORWARD ACTION REQUESTS (CAR/CL/FAR)

VALIDATION FINDINGS:

CAR ID	01	Date: 16/12/2019
Description of CAR		
<p>During the document review it was observed that following details are missing in section 1 of the joint PD+MR version 01:</p> <ol style="list-style-type: none"> 1. A summary description of the technologies/measures for individual wind project (e.g., plant, equipment, process, or management or conservation measure) is included in the project however Supporting for technical measures is also not submitted to DOE. 2. The relevant implementation dates (e.g., dates of construction, continued operation periods). Supporting regarding Commissions certificate is also missing. 3. The total GHG emission reductions or removals generated in this monitoring period. 4. The compliance of section 1.11 is not as VCS PD template. Corrective action is required 5. The scenario prior to project activity is not described in section 1.10 of the VCS PD. The scenario as mentioned in section 2.4 is similar or different? Kindly take corrective action <p>Corrective action is sought for the same.</p>		
Project participant response		Date: 17/12/2019
<ol style="list-style-type: none"> 1. <i>Technical information of the project activity has been sourced from Commissioning Certificate of the project activity and the same has been submitted to the verification team</i> 2. <i>Detailed chronology of events related to the project activity has been included in Version 02 of the PD</i> 3. <i>Total GHG emissions achieved during the present monitoring period has been included in the version 02</i> 4. <i>Section 1.11 of the PD has been revised as per the template</i> 5. <i>The scenario prior to the project activity has been described transparently in section 1.10 of PD. Scenario explained in section 2.4 is similar.</i> 		
Documentation provided by project participant		
<ol style="list-style-type: none"> 1. <i>PD Version 02</i> 2. <i>Commissioning Letter of the project</i> 		
DOE assessment		Date: 18/12/2019
<p>Following are the observation of the DOE:</p> <ol style="list-style-type: none"> 1. Summary description of Technical information of the project is mentioned and the same is sourced from Commissioning Certificate. CAR is thus closed 		

2. The detail Chronology is now added in the revised joint PD and MR and the same is checked and found correct by the assessment team. CAR is thus closed
3. The total GHG emissions achieved during the present monitoring period is now included in the joint VCS PD and MR. CAR is thus closed
4. Section 1.11 of the Joint VCS PD and MR is now revised. CAR is thus closed
5. The scenario is section 1.10 and 2.4 are similar. CAR is thus closed.

CAR ID	02	Date: 16/12/2019
Description of CAR		
<p>During the desk review it was observed that the details regarding REC benefits were not provided. Please provide appropriate link for the same and also proper documents to confirm that the PP will not claim other form of environmental credit for the monitoring period concerned. Moreover, PP should also produce documentary evidence that it has not participated in any other form of GHG emission/rejected by any other form of GHG program for the current monitoring period.</p> <p>Corrective action is sought for the same and documents are required to be submitted for further analysis.</p>		
Project participant response		Date: 17/12/2019
<p>The project has not been registered with any other mechanisms, however is under validation at UNFCCC. However for the same Monitoring Period, PP is not going to claim Emission Reduction other than VCS and a declaration dated 24/11/2019 has been submitted for the same. Also it can be crosschecked that PP is not claiming REC benefits, the same can be verified with the REC accreditation body of India¹⁷.</p>		
Documentation provided by project participant		
<p>declaration dated 24/11/2019 is submitted to the assessment team</p>		
DOE assessment		Date: 18/12/2019
<p>Assessment team checked the declaration dated 24/11/2019 and found that project is not availing any REC benefit and PP is not claiming any other benefit for the monitoring period other than REC. Moreover, declaration also state that it has not participated in any other form of GHG emission/rejected by any other form of GHG program for the current monitoring period. CAR is thus closed.</p>		

¹⁷ https://recregistryindia.nic.in/index.php/general/publics/accredited_regens_pdf

CAR ID	03	Date: 16/12/2019
Description of CAR		
<p>During the desk review of the PDD and onsite visit document verifications, Applus+ Certification team observed following inconsistency in the additionality determination :</p> <ol style="list-style-type: none"> 1. Following documents are missing and thus the IRR calculation is reserved: <ol style="list-style-type: none"> a. PLF reports b. All the input value (e.g. Offer letters, DPR (if any), Loan sanction if any, Insurance etc.) 2. IRR calculation is reserved as no IRR sheets are provided 3. The supporting documents for the Common practice analysis are not submitted to the DOE. Common practice analysis is thus reserved till the submission of the same. <p>Additionality section of the VCS PD version 01 is reserved till the documents and IRR sheet are submitted.</p>		
Project participant response		Date: 17/12/2019
<ol style="list-style-type: none"> 1. <i>Following documents are provided for the open issues</i> <ol style="list-style-type: none"> (i) <i>DPR of project</i> (ii) <i>EPC copy of the projects</i> 2. <i>IRR sheets has been submitted with Version 02 of PD</i> 3. <i>CPA sheet and supporting for input values has been submitted with Version 02 of the PD.</i> 		
Documentation provided by project participant		
<ol style="list-style-type: none"> 1. <i>PD Version 02</i> 2. <i>DPR</i> 3. <i>EPC Copy</i> 4. <i>IRR Sheet</i> 5. <i>CPA Sheet</i> 		
DOE assessment		Date: 18/12/2019
<p>All the input assumptions supporting documents are now submitted to the assessment team. The same is checked and assessment team confirm that IRR calculation is correct and conservative.</p> <p>All the supporting document for Common practice analysis is also checked and found correct by the assessment team. CAR is thus closed.</p>		

CAR ID	04	Date: 16/12/2019
Description of CAR		
Assessment team found during desk review is that emission reduction sheet is missing for the project activity. Hence estimated ER in section 3 of the Joint PD and MR is thus reserved.		
Project participant response		Date: 17/12/2019
<i>ER Estimation sheet has been submitted with PD Version 02</i>		
Documentation provided by project participant		
<i>ER Estimation sheet</i>		
DOE assessment		Date: 18/12/2019
The estimated emission reduction sheet is checked and found correct by the assessment team. CAR is thus closed.		

CAR ID	05	Date: 16/12/2019
Description of CAR		
During the document review it is observed that “No net Harm” details is provided in the joint PD and MR. However, supporting documents is not shared with DOE. Corrective action is sought in this regard in the respective section of the MR.		
Project participant response		Date: 17/12/2019
<p>The project activity does not cause any harm to the local ecology. It primarily requires the installation of the Wind PV Project, setting up HT transmission lines and installation of other accessories. However, there are no negative impacts on air, water, soil quality and ambience are envisaged due to the project activity.</p> <p>Also as per the Central Pollution Control Board of India notification¹⁸ Wind PV projects falls under White Category and are practically non-polluting.</p>		
Documentation provided by project participant		
<i>MR Version 02</i>		
DOE assessment		Date: 18/12/2019

¹⁸ http://envfor.nic.in/sites/default/files/Latest_118_Final_Directions.pdf

The detail of No Net Harm assessment is now included in the revised joint VCS PD and MR. CAR is thus closed.

CAR ID	06	Date: 16/12/2019
Description of CAR		
<p>During the desk review related to stakeholder consultation following observation is made by the Applus+ Certification project team:</p> <ol style="list-style-type: none"> 1. The stakeholder documentation is also not provided to the DOE 2. The site photograph of LSHC meeting is not provided to the DOE. <p>Corrective action is this sought for the same.</p>		
Project participant response		Date: 17/12/2019
<ol style="list-style-type: none"> 1. LSHM Documents of the project is submitted 2. LSHM pics of the project is submitted with PD Version 02 		
Documentation provided by project participant		
<ol style="list-style-type: none"> 1. LSHM documents 2. PD Version 02 		
DOE assessment		Date: 18/12/2019
<p>The LSC details are now included in the revised VCS PD and MR. The supporting documents like MoM, Attendance sheet is now submitted to the assessment team and found correct. CAR is thus closed.</p>		

CAR ID	07	Date: 16/12/2019
Description of CAR		
<p>During the desk review it is observed that the section in the VCS PD & MR do not contains details of Public comments (if any). Corrective action is sought.</p>		
Project participant response		Date: 17/12/2019
<p><i>PD Version 02 has been revised as per the CAR raised</i></p>		
Documentation provided by project participant		

<i>PD Version 02</i>	
DOE assessment	Date: 18/12/2019
No GSC comment is received for the project activity. The same detail is now included in the revised VCS PD and MR. CAR is thus closed.	

FAR ID	01	Date: 16/12/2019
Description of CAR		
The total Capacity of the project activity is not commissioned yet. The implementation status of the total capacity of the present project activity needed to be checked during next periodic verification.		
Project participant response		Date:
Documentation provided by project participant		
DOE assessment		Date:

VERIFICATION FINDINGS:

CAR ID	08	Date: 16/12/2019
Description of CAR		
Assessment team found during desk review is that emission reduction sheet is missing for the project activity. JMR sheets and the invoices are missing. The claimed ER is thus reserved till submission of proper documents.		
The comparison of actual VERs vs. Estimated VERs is missing.		
Project participant response		Date: 17/12/2019
<i>Actual Emission Reduction sheet is submitted with MR Version 02. Also supporting for the same is submitted to the verification team.</i>		
<i>The comparison of actual VER vs estimated VER is mentioned in MR Version 02.</i>		
Documentation provided by project participant		

<ol style="list-style-type: none"> 1. <i>Actual ER Sheet</i> 2. <i>JMR of monitoring period</i> 3. <i>MR Version 02</i> 	
DOE assessment	Date: 18/12/2019
<p>The Actual ER sheet is now checked and found correct. The comparison between actual and estimated ER is now found correct. The JMR sheets along with the daily log sheets generation from the CMS is cross checked and found correct. CAR is thus closed.</p>	

CAR ID	09	Date: 16/12/2019
Description of CAR		
<p>The calibration certificates of and details for the individual PP are missing. The assessment is thus reserved until the calibration details are submitted.</p> <p>The breakdown details for the complete monitoring period are missing. Log records are not submitted to DOE. Corrective action is sought in joint PD and MR and supporting documents are sought for the same.</p> <p>The feeder detail for the connected panels is missing. Corrective action is sought in joint PD and MR and supporting documents are sought for the same.</p> <p>Section 6 of the Joint PD and MR is blank. No information is included. Corrective action is sought in joint PD and MR and supporting documents are sought for the same.</p>		
Project participant response		Date: 17/12/2019
<p><i>The initial meter calibration report of the project is submitted with MR Version 02</i></p> <p><i>The breakdown details for the current monitoring period is mentioned in MR Version 02. The feeder wise details of the project is mentioned in the MR Version 02</i></p> <p><i>Section 6 of Joint PD and MR has been updated and submitted herewith</i></p>		
Documentation provided by project participant		
<i>MR Version 02</i>		
DOE assessment	Date: 18/12/2019	

Following are the observation of the DOE:

1. The Calibration details are now checked and found correct by the assessment team. CAR is thus closed
2. The breakdown log sheets are found correct. No unforeseen incident happened in the monitoring period. CAR is thus closed
3. The feeder details are checked and now the revised information is included in the joint VCS PD and MR. CAR is thus closed
4. Section 6 of the Joint VCS PD and MR is now rectified. CAR is thus closed.

APPENDIX 3: COMPETENCE OF TEAM MEMBERS AND TECHNICAL REVIEWERS

Verification team member

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

Technical reviewer and approver of the verification and certification report

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer (TR)	EI	Xue	Denny	LGAI Technological Center S.A. (Applus+ Certification)
2.	Approver	IR	Sendin	Juan	LGAI Technological Center S.A. (Applus+ Certification)

Short CVs of the Team:

1. Mr. Sukanta DAS, has done M. SC in (Electronics and Photonics) and M. Tech in (Energy technology) from Tezpur Central University/ Indian Institute of technology Bombay in India. He is a certified lead auditor for ISO 14001 EMS LA and ISO 9001 QMS LA from International registry for Certified Auditors (IRCA) and Certified Lean Management practitioner from Quality Council of India (QCI). He has more than Nine (9) years of working experience at TUV NoRD/ Reconsult/CRA/ Applus+ Certification under various categories of projects stating from Renewable to waste to supercritical projects. He was JI/ CDM Lead Assessor in TUV NoRD and was involved in more than 100 CDM validation and verifications activities in Gold Standard, VCS, CDM projects as a team leader/technical reviewer / validator / verifier covering the sectoral scope 1, 13 technical areas 1.2/1.1/13.1. Currently he is associated with True Quality Certifications Private Limited and is empanelled with Applus+ Certification to carry out GHG audit.
2. Denny Xue (Master Degree in Environmental Engineering, Bachelor Degree in Thermal Engineering) is an Auditor appointed by LGAI Technological Center S.A. (Applus+ Certification) for the GHG project assessment. He is based on Shanghai. He has 1.5 years of work experiences in CDM project development. Before he joined LGAI Technological Center S.A. (Applus+ Certification), he has been worked for Shanghai Chuanji Investment and Management which is a CDM consultancy company as a project manager for CDM project development.

APPENDIX 4: ABBREVIATIONS

Abbreviations	Full texts
BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CMS	Central Monitoring System
CER	Certified Emission Reduction(s)
CEA	Central Electricity Authority
CL	Clarification request
CM	Combined Margin
CMS	Central Monitoring system
CO ₂	Carbon dioxide
CO _{2e}	Carbon dioxide equivalent
DNA	Designated National Authority
DOE	Designated Operational Entity
DR	Document Review
EF	Emission Factor
EIA	Environmental Impact Assessment
ER	Emission Reductions
FAR	Forward Action Request
GHG	Greenhouse gas(es)
OM	Operating Margin
GWP	Global Warming potential
JMR	Joint Metering reading
RBI	Reserve Bank Of India

APPENDIX 5: CALIBRATION DETAILS

Skeiron Renewable Energy Kushtagi Private Limited					
	Main	Check	Calibration Date	Due Date of calibration	Accuracy class
KST147	16112943	16112944	10/01/2018	09/01/2023	0.2s
KST177	16112934	16112937	10/01/2018	09/01/2023	0.2s
KST101	18015394	18015396	10/01/2018	09/01/2023	0.2s
KST230	18015386	18015387	10/01/2018	09/01/2023	0.2s

Saroja Renewables Limited					
	Main	Check	Calibration Date	Due Date of calibration	Accuracy class
KST51	18015411	18015426	10/01/2018	09/01/2023	0.2s
KST67	18015412	18015416	10/01/2018	09/01/2023	0.2s
KST71	18015440	18015441	10/01/2018	09/01/2023	0.2s

Shanay Renewables Ltd.					
	Main	Check	Calibration Date	Due Date of calibration	Accuracy class
KST130	18015383	18015384	10/01/2018	09/01/2023	0.2s
KST131	18015438	18015379	10/01/2018	09/01/2023	0.2s

No delay in Calibration is observed for the project activity for the current monitoring period.