




## Verification and certification report form for CDM project activities

(Version 01.0)

## VERIFICATION AND CERTIFICATION REPORT

<b>Title of the project activity</b>	Mampuri Wind Power Project 3
<b>Reference number of the project activity</b>	9990
<b>Version number of the verification and certification report</b>	02
<b>Completion date of the verification and certification report</b>	13/02/2017
<b>Monitoring period number and duration of this monitoring period</b>	1 <sup>st</sup> Monitoring period From 01/12/2014 to 31/12/2015
<b>Version number of monitoring report to which this report applies</b>	02.2
<b>Crediting period of the project activity corresponding to this monitoring period</b>	01/12/2014 – 30/11/2021
<b>Project participant(s)</b>	Senok Wind Resource Pvt. Ltd.
<b>Host Party</b>	Sri Lanka
<b>Sectoral scope(s), selected methodology(ies), and where applicable, selected standardized baseline(s)</b>	Scope 01: Energy Industries (renewable/non-renewable sources) <a href="#">AMS-I.D. ver. 17</a> - Grid connected renewable electricity generation
<b>Estimated GHG emission reductions or net anthropogenic GHG removals for this monitoring period in the registered PDD</b>	19,880 tCO <sub>2</sub> e
<b>Certified GHG emission reductions or net anthropogenic GHG removals for this monitoring period</b>	19,370 tCO <sub>2</sub> e
<b>Name of DOE</b>	KBS Certification Services Pvt. Ltd
<b>Name, position and signature of the approver of the verification and certification report</b>	 Kaushal Goyal Managing Director KBS Certification Services Pvt. Ltd.

## SECTION A. Executive summary

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KBS Certification Services Pvt. Ltd. has performed the 1<sup>st</sup> periodic verification of the CDM project 'Mampuri Wind Power Project 3' and UNFCCC Ref. Number 9990. The verification includes confirming the implementation of the monitoring plan of the registered PDD and the application of the monitoring methodology as per AMS I.D. "Grid Connected Renewable Electricity Generation" Version 17. A site visit was conducted to check the implementation of registered monitoring plan and verify the data submitted in the monitoring report.

### Purpose:

The purpose of this verification exercise is, by review of objective evidence, to establish that:

- The project activity has been implemented and operated as per the revised approved PDD and that all physical features (technology, project equipment, and monitoring and metering equipment) of the project are in place;
- Monitoring report and other supporting documents are complete;
- The actual monitoring systems & procedures and monitoring report conforms with the requirements of the approved monitoring plan and the approved monitoring methodology;
- The data is recorded and stored as per the monitoring methodology and approved monitoring plan.

### Scope:

The scope of the verification is the independent and objective review and ex post determination of the monitored reductions in GHG emission by the project activity. The verification is based on review of monitoring report, supporting information and

- (a) The registered PDD, including the monitoring plan and the corresponding validation opinion(s);
- (b) Previous verification reports, deviation requests, requests for revision of monitoring plan;
- (c) Monitoring report for the monitoring period under verification including CER calculations sheets and all supporting documents;
- (d) The applied monitoring methodology;
- (e) The applied standardized baseline (if applicable);
- (f) Relevant decisions, clarifications and guidance from the CMP and the CDM Executive Board;
- (g) All information and references relevant to the project activity's resulting in emission reductions

The project is assessed against the requirements of the Kyoto Protocol, the CDM Modalities and Procedures and related rules and guidance.

KBS has based on the recommendations in the latest version of CDM Validation and Verification Standard, employed a rule-based approach in the verification, focusing on the identification of significant reporting risks and the reliability of project monitoring.

### Description of project:

The project activity is the installation of 5 numbers of 2.1 MW wind turbine generators with the total capacity of the 10.5 MW. The electricity generated from the project is supplied to the National grid through a Small Power Purchase Agreement (SPPA) signed with Ceylon Electricity Board (CEB). Since the electricity replaces electricity generated from grid based power plant which consist considerable amount of fossil fuel based power plant, the project reduces CO<sub>2</sub> emission associated with the grid based power plants.

### Methodology:

KBS follows a rule based verification approach, wherein, as a first step, the contract review is undertaken as per latest version of CDM Accreditation Standard. Subsequently, after the contract is signed, the monitoring report of the project activity is made publicly available at UNFCCC website as per CDM procedures. A desk review of the project documentation is undertaken, which is followed by an onsite visit by the members of verification team in accordance with the latest version of CDM AS. The verification protocol is filled by the verification team that is based on standard auditing practices and version 9 of CDM VVS, to capture the assessment of applicable CDM requirements viz., version 9 of CDM Project Standard, revised PDD, applied methodology/ies, applied standardized baseline and/or tools and recent decisions. The verification protocol provides transparent means to record the observations and compliances by the verification team members and the nonconformities, if any. The verification protocol is an internal document, and is available on request. Following are the major milestones for the verification under consideration.

Verification contract	25/05/2016
Publication of MR	07/06/2016
On site verification	07/07/2016
Draft Verification Report	21/09/2016
Final Verification Report	13/02/2017

**Conclusion:**

The post registration changes identified during the verification is correctly addressed and revised PDD is submitted. From the verification assessment, it is confirmed that the project activity has been implemented and operated as per the revised PDD and that all physical features (technology, project equipment, and monitoring and metering equipment) of the project are in place. All the monitoring systems & procedures and monitoring report confirms the requirements of the approved monitoring plan and the approved monitoring methodology. Based on the information seen and evaluated we confirm that the implementation of the project has resulted in 19,370 tCO<sub>2</sub>e emission reductions during period 01/12/2014 – 31/12/2015.

**SECTION B. Verification team, technical reviewer and approver****B.1. Verification team member**

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk review	On-site inspection	Interview(s)	Verification findings
1.	Team Leader/ Verifier/ Technical Expert	IR	Narendra Kumar	R	Central Office	x	x	x	X
2	Verifier	IR	Sharma	Chetan Swaroop	Central Office	x			x
3	Local Expert	EI	Poddiwala	Pathmanatha	Central Office	x	x	x	

**B.2. 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/ Manager Technical & Certification	IR	Kandari	Sanjay	Central Office
2	Authorizer	IR	Goyal	Kaushal	Central Office

**SECTION C. Application of materiality****C.1. Consideration of materiality in planning the verification**

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
1.	Error in Data Transfer from invoices (which includes energy meter reading) to ER Spread sheet. The measurements are	High	Possible human error during transfer of data to ER spreadsheets and MR	Verification Team checked all the invoices and compared with ER spread sheet to check for any material error during data transfer.

	conducted with the aid of calibrated equipment's and errors could result from human errors during the information transfer from the source to emission reduction sheet.			
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## C.2. Consideration of materiality in conducting the verification

The prescribed thresholds for materiality, as per §361 of VVS V9.

Prescribed range of ERs/annum	500,000+	300,000+ to 500,000	300,000	SSC PAs	MSC PAs
Prescribed Threshold	0.5%	1.0%	2.0%	5.0%	10.0%

The identified/selected materiality threshold for the project activity under current monitoring period is 5% as project activity is small scale project activity.

	MR Version (Draft)	MR Version (Final)
Emission reductions/annum	19,513 t CO <sub>2</sub> e	19,370t CO <sub>2</sub> e
Identified Threshold	5.0%	5.0%

The impact of errors observed during verification for each monitoring parameter on the emission reduction calculation is provided below:

Parameter	Verification approach	Error identified	Corrected	Extrapolated error for population size (Qty and %)	Within Threshold
EG <sub>y</sub>	Complete data check	No error identified	NA	NA	Yes
EG <sub>imp,y</sub>	Complete data check	No error identified	NA	NA	Yes
EG <sub>exp,y</sub>	Complete data check	No error identified	NA	NA	Yes

## SECTION D. Means of verification

### D.1. Desk review

A desk review is undertaken, involving but not limited to,

- A review of the data and information presented to verify their completeness;
- A review of the monitoring plan and monitoring methodology, paying particular attention to the frequency of measurements, the quality of metering equipment including calibration requirements, and the quality assurance and quality control procedures;
- An evaluation of data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions.

The list of documents reviewed is included in the section 'Appendix 3' of this report.

**D.2. On-site inspection**

Duration of on-site inspection: 07/07/2016				
No.	Activity performed on-site	Site location	Date	Team member
1.	Implementation and Operation of the CDM project activity based on registered Monitoring Plan and physical features of the project activity as per registered PDD	Mampuri/ Nawakkaduwa village, Puttalam District, North Western Province, Sri Lanka	07/07/2016	Narendra Kumar R Pathmanatha Poddiwala
2.	Information flows for generating, aggregating and reporting the monitoring parameters			
3.	Competency of the operating personnel, monitoring personnel and calibrating agencies			
4.	Data collection procedures			
5.	Calibration performance and monitoring practices followed for monitoring equipment's used in the project activity			
6.	Quality Control and Quality Assurance procedures against the approved monitoring plan			
7.	Calculation and assumptions made in determining the GHG data and emission reductions			
8.	Compliance with CDM criterion and relevant guidance with respect to monitoring plan			
9.	Level of accuracy (Materiality) of the monitoring activity			

**D.3. Interviews**

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Moraes	Rozanne	General Manager, SWPL	07/07/2016	<ul style="list-style-type: none"> <li>- General aspects of the project</li> <li>- Changes since validation / previous verification</li> <li>- Remaining issues from validation/ previous verification</li> <li>- Quality management system</li> <li>- Involved personnel and responsibilities</li> <li>- Training and practice of the operational personnel</li> <li>- Implementation of the monitoring plan</li> <li>- Monitoring data management</li> <li>- Data analysis</li> <li>- Issues in the MR</li> <li>- ER calculation</li> </ul>	Narendra Kumar R Pathmanatha Poddiwala
2	Alwis	Rajika	Manager, SWPL	07/07/2016		
3	K	Chandra Kanth	Plant supervisor	07/07/2016		

**D.4. Sampling approach**

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No parameter is monitored through sampling approach.

**D.5. Clarification requests, corrective action requests and forward action requests raised**

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
Compliance of the monitoring report with the monitoring report form	-	-	-
Compliance of the project implementation with the registered PDD	1	-	-
Post-registration changes	-	-	-
Compliance of the monitoring plan with the monitoring methodology including applicable tool and standardized baseline	-	-	-
Compliance of monitoring activities with the registered monitoring plan	2	2	-
Compliance with the calibration frequency requirements for measuring instruments	-	1	-
Assessment of data and calculation of emission reductions or net removals	-	-	-
Project Participants	-	-	-
<b>Total</b>	<b>3</b>	<b>3</b>	<b>-</b>

**SECTION E. Verification findings****E.1. Compliance of the monitoring report with the monitoring report form**

<b>Means of verification</b>	Verification team checked the monitoring report with latest version of MR available in the UNFCCC website (ie, version 5.1)/9/ and “Instructions for filling out the monitoring report form” mentioned as attachment to Monitoring report form (version 05.1).
<b>Findings</b>	No finding
<b>Conclusion</b>	Verification team confirms that final monitoring report is completed using the latest valid version of the applicable monitoring report form/9/.

**E.2. Remaining forward action requests from validation and/or previous verification**

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Verification team checked validation report/4/. No FAR is raised during the validation.

**E.3. Compliance of the project implementation with the registered project design document**

<b>Means of verification</b>	<p>The project activity comprises 5 WTGs of 2.1 MW each of Suzlon S-88 make aggregating to a capacity of 10.5 MW. All the WTGs of the project activity got commissioned on 19/05/2014 and the dates of commissioning were verified from the commissioning certificate provided by CEB/13/. The WTGs have been in operation during the current monitoring period in compliance with the description provided in the registered PDD/3/.</p> <p>The entire project WTGs contain a unique location identification number as mentioned in Section A.2 of the MR/1/, verified from the respective Project handing over checklist. The location numbers are associated with the geo-coordinates of the individual WTG. The information related to commissioning of WTGs were checked against the respective commissioning certificates/13/issued by Ceylon Electricity Board (CEB) and found in order. The WTG rated capacity, location/identification number, make, meter serial number and make etc. were verified from the name plates and technical specification/14/ and found to be consistent. The electricity generated from the project is fed into the regional grid/15/. The electricity produced is measured by the main meter owned by CEB located in the metering yard at the project site.</p>
<b>Findings</b>	CL-01 is raised and closed successfully
<b>Conclusion</b>	<p>The implementation and operation of the project activity has been assessed against the registered PDD.</p> <p>a) The project activity consist of 5 Wind Turbine Generators of 2.1 MW commissioned on 19/05/2014 in Mampuri/Nawakkaduwa verified from the commissioning certificate/13/ and during the on-site assessment.</p> <p>b) The implementation is in line with the registered PDD</p>

	<p>c) There is no deviation nor changes from the description in the registered PDD in the current monitoring period.</p> <p>d) There is a change in project monitoring plan from the registered PDD. Hence, PRC for change in project monitoring plan is sought.</p> <p>e) The verification team reviewed the registered PDD, including the monitoring plan and the corresponding validation report, the applied monitoring methodology, relevant decisions from the CMP and the CDM EB and found that the MR for this monitoring period is line with all the above mentioned documents</p>
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#### **E.4. Post-registration changes**

##### **E.4.1. Temporary deviations from the registered monitoring plan, monitoring methodology or standardized baseline**

No temporary deviation from registered monitoring plan or monitoring methodology is sought.

##### **E.4.2. Corrections**

No correction in the PDD is sought since registration of the project activity.

##### **E.4.3. Changes to the start date of the crediting period**

No change in start date of crediting period is sought.

##### **E.4.4. Inclusion of a monitoring plan to a registered project activity**

Not applicable as the PP provided the monitoring plan in registered PDD itself.

##### **E.4.5. Permanent changes from registered monitoring plan, monitoring methodology or standardized baseline**

The following change from the registered monitoring plan is observed during verification:

*As per registered PDD, the accuracy class of energy meter should be 0.1S. However, in actual, the accuracy class of energy meter installed at site is 1.*

CL-02 is raised in this regard. Hence PP has submitted the revised PDD reflecting the above changes. As observed from site visit and from verification of PP, verification team found that the energy meter is not in the control of PP, but in the control of CEB. Hence, the change in the accuracy of energy meter is not the purview of PP which is done by CEB. Since the changes are in line with the requirement of para 5 (b), Appendix of Project Standard, version 9, the changes does not require prior approval. So, the request for approval of PRC is submitted along with the issuance of this monitoring period. The verification team checked the same and validation assessment of the changes are provided in separate PRC validation report. Verification team found that the changes are in line with the requirement of section 13.8.3.4 of Project standard, version 9. CL-02 is closed successfully.

##### **E.4.6. Changes to the project design of a registered project activity**

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No change in project design of the registered project activity is sought.

##### **E.4.7. Types of changes specific to afforestation and reforestation project activities**

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Not applicable

### E.5. Compliance of monitoring plan with the monitoring methodology including applicable tool and standardized baseline

<b>Means of verification</b>	The monitoring parameters included in the monitoring report/1/ allow determination of proper emission reduction in the context of the project activity. This was verified through the monitoring plan in monitoring and the same was found to be in accordance with the referred applied methodology AMS-I.D., Version 17 /6/.
<b>Findings</b>	No finding
<b>Conclusion</b>	The monitoring plan mentioned in the MR is in line with the applied methodology AMS-I.D., Version 17 /6/. The monitoring mechanism is in line with the methodology and is effective and reliable.

### E.6. Compliance of monitoring activities with the registered monitoring plan

#### E.6.1. Data and parameters fixed ex ante or at renewal of crediting period

<b>Means of verification</b>	The verification team has checked the ex-ante parameters and data stated in Section D.1 of MR and compared with section B.6.2 of the revised approved PDD whether all parameters fixed ex-ante for the crediting period have been applied correctly.		
	<b>Ex-ante Parameter</b>	<b>Value</b>	<b>Consistent with the PDD/3/&amp; the source mentioned in it</b>
	EF <sub>CO<sub>2</sub>,y</sub>	0.7193 tCO <sub>2</sub> /MWh	Yes
	EF <sub>OM,y</sub>	0.7037 tCO <sub>2</sub> /MWh	Yes
	EF <sub>BM,y</sub>	0.7664 tCO <sub>2</sub> /MWh	Yes
<b>Findings</b>	CAR-01 is raised and closed successfully.		
<b>Conclusion</b>	The values of ex ante fixed parameters have been verified from the registered PDD/3/. Same has been crosschecked with the source mentioned in the PDD and found that the value of OM is not consistent. Hence CAR-01 is raised and PP corrected the same. The verification team confirms that the values used/applied in the revised MR are correct and justified. Also, the ex-ante values have been correctly applied in the calculation of emission reductions.		

#### E.6.2. Data and parameters monitored

<b>Means of verification</b>	<p>The verification team has determined whether the registered monitoring plan has been properly implemented and followed by the PP that the monitoring has been carried out in accordance with the registered monitoring plan; and determined whether all parameters including project emission parameters, baseline emission parameters and leakage parameters used for emission reduction calculation stated in the registered monitoring plan are monitored or used appropriately as per the registered PDD.</p> <p>During the verification all monitoring parameters listed in Section D.2 of MR/1/ were compared with section B.7.1 of the registered PDD have been verified with regard to the:</p> <ul style="list-style-type: none"> <li>(i) appropriateness of the applied measurement / determination method,</li> <li>(ii) the correctness of the values applied for ER calculation,</li> <li>(iii) the accuracy, and applied QA/QC measures.</li> </ul> <p>The monitored values are assessed as follows:</p> <p><b>EG<sub>y</sub></b>- Quantity of net electricity supplied to the grid in a year is calculated as difference between EG<sub>exp,y</sub>(Electricity exported to Grid) the EG<sub>imp,y</sub>(Electricity imported from the Grid). The monitoring procedure of EG<sub>exp,y</sub> and EG<sub>imp,y</sub> are given below. The calculation is verified from the emission reduction calculation sheet and found that the total value considered (ie, 26,930 MWh) is correct.</p> <p><b>EG<sub>imp,y</sub></b>- Electricity imported from the Grid is measured by common main energy meter (it is a two way meter where export &amp; import are measured by the same meter). The energy imported from the grid is measured continuously and recorded monthly in import register and CEB electricity bill. Verification team checked the electricity bills provided by CEB for all the months covering the monitoring period and confirmed that the values provided in the ER calculation sheet is correct. It is</p>
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	<p>also noticed that the energy meter is not calibrated on annual basis. Hence, PP added the maximum possible error of 1% to the import reading for the gap period (from May 2015 to September 2015) which is found to be in line with the requirement of project standard. Hence, the verification team accept the adjusted import value considered for the ER calculation (i.e, 89 MWh).</p> <p><b>EG<sub>exp,y</sub></b>-Electricity exported to Grid is measured by common main energy meter (it is a two way meter where export &amp; import are measured by the same meter) installed at the point of supply (POS). The electricity generated is measured continuously and recorded monthly in the Export register and the electricity sale invoices. The invoices contains the value of electricity exported to grid which is signed by both PP and area electrical engineer of CEB. Verification team checked export register and all the monthly invoices and found that the value provided in the ER calculation sheet is correct. It is also noticed that the energy meter is not calibrated on annual basis. Hence, PP deducted the maximum possible error of 1% to the export reading for the gap period (from May 2015 to September 2015) which is found to be in line with the requirement of project standard. Hence, the verification team accepts the total value considered for the ER calculation (ie, 27,019 MWh).</p> <p>Verification team found that the accuracy of energy meter installed at the site is not as per the accuracy requirement mentioned in the registered PDD. Hence, PP has submitted revised PDD as post registration change which is validated in separate PRC validation report.</p>
<b>Findings</b>	CL-02, CL-03& CAR-02 are raised and closed successfully
<b>Conclusion</b>	<p>Corresponding to the §389 of VVS V9/11/, the team confirm that the monitoring has been carried out in accordance with the approved PDD/3/.</p> <p>The monitoring system is in compliance with the information flow for the parameters as mentioned in monitoring plan in revised PDD submitted for PRC validation/3/.</p> <p>The monitored data for the parameters has been verified by checking the procedure for information flow and found to be complete and consistent.</p>

### E.6.3. Implementation of sampling plan

<b>Means of verification</b>	No parameter is determined by sampling procedure. Hence Not applicable
<b>Findings</b>	NA
<b>Conclusion</b>	NA

### E.7. Compliance with the calibration frequency requirements for measuring instruments

<b>Means of verification</b>	<p>The verification team determined whether the calibration of the measuring equipment that has an impact on the claimed emission reductions is conducted by the PP at a frequency specified in the registered monitoring plan. The calibration records were verified to check the frequency of calibration of the measuring instruments.</p> <p>The calibration details of the monitoring equipment are verified as below:</p>			
	Measuring Equipment & Sr. Number	Calibration dates/18/	Calibration validity/3/	Validity of calibration during the monitoring period.
	Energy meter 212564063	16/05/2014 03/09/2015	15/05/2015 02/09/2016	No. the energy meter is not calibrated in 1 year

		03/09/2015	02/09/2016	frequency. No calibration validity for the period from 16/05/2015 to 02/09/2015. However, the 03/09/2015 calibration result shows, the meter error is within the permissible limit. Hence, PP deducted the maximum possible error of 1% to the meter reading for period from May 2015 to September 2015. This is verified and found to be acceptable
	Verification team checked all the calibration reports/20/ and found that the results of the all the calibrations are within satisfactory level. Also it is found that for the calibration gap period, the error is correctly applied as it is not calibrated within one year frequency.			
<b>Findings</b>	CAR-03 is raised and closed successfully			
<b>Conclusion</b>	Corresponding to the § 394 of VVS V9/12/, verification team has confirms that periodic calibration was carried out for all the required monitoring equipment's that have an impact on the claimed emission reductions. The frequency of calibration is annual as per the registered PDD. The calibration delay was found in the energy meter where the maximum possible error correctly applied which is in line with the Appendix of the VVS, version 9.			

## E.8. Assessment of data and calculation of emission reductions or net removals

### E.8.1. Calculation of baseline GHG emissions or baseline net GHG removals by sinks

<b>Means of verification</b>	<p>The verification team has checked whether calculations of baseline GHG emissions calculation have been carried out in accordance with the formulae and methods described in the registered monitoring plan.</p> <p>In detail the following has been verified:</p> <p><u>Transparency:</u> It has been checked whether the calculation of baseline emissions is fully traceable and, where used, the Excel calculation provides all calculation formulae.</p> <p><u>Parameter consistency:</u> It has been checked whether all internal and external parameters and data used for the calculation are applied consistently in the monitoring report and the calculation spreadsheet.</p> <p><u>Correctness:</u> It has been checked whether the applied formulae and methods for calculating baseline emissions are in accordance with the monitoring plan and the approved methodology.</p> <p><u>Completeness:</u> It has been checked whether all calculations are complete and without omissions</p> <p>The baseline emissions is calculated using the below formula:</p> $BE_y = EG_y * EF_{CO_2,y}$ <p>where</p> <p><math>BE_y</math> = Baseline Emissions in tCO<sub>2</sub>e</p> <p><math>EG_y</math> = Quantity of net electricity supplied to the grid</p> <p><math>EF_{grid,CM,y}</math> = Combined Margin Emission factor</p> <p>PP has submitted the calculation in the excel sheet/2/. The baseline calculation in the excel sheet is checked whether the calculation is in accordance with the formula given in the approved PDD/3/ and the selected methodologies/6/.</p>
<b>Findings</b>	No finding
<b>Conclusion</b>	<p>The verification team confirms the following:</p> <ul style="list-style-type: none"> <li>The calculations of baseline GHG emissions have been carried out in accordance with the equations and methods described in the registered monitoring plan and applied methodology.</li> </ul>

	<ul style="list-style-type: none"> <li>The emission factor applied is an ex-ante value valid for the fixed crediting period.</li> <li>Any assumptions used in emission or removal calculations have been justified.</li> <li>Appropriate emission factor and other reference values have been correctly applied. It can be confirmed that the baseline calculation is overall correct.</li> <li>The ER calculation sheet provided is clear, transparent and the calculations provided in the sheet are reproducible.</li> <li>Hence, the baseline emission reported in the monitoring report for the monitoring period (ie, BE<sub>y</sub> = 19,370 tCO<sub>2</sub>e) is verified to be correct</li> </ul>
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### E.8.2. Calculation of project GHG emissions or actual net GHG removals by sinks

<b>Means of verification</b>	As mentioned in the PDD, the project emission is zero as the wind power project does not involve in emission of any GHG gases.
<b>Findings</b>	No findings
<b>Conclusion</b>	The project emission is zero. ie, PE <sub>y</sub> = 0

### E.8.3. Calculation of leakage GHG emissions

<b>Means of verification</b>	During the verification it has been checked whether leakage emissions have to be considered and in cases where leakage emissions have to be calculated, the respective calculation of leakage GHG emissions has been checked. As per PDD, no leakage emission is considered in the project.
<b>Findings</b>	No findings
<b>Conclusion</b>	Leakage emission is zero. ie, L <sub>y</sub> = 0

### E.8.4. Summary of calculation of GHG emission reductions or net anthropogenic GHG removals by sinks

<b>Means of verification</b>	Section E.4 of MR demonstrate the summary of GHG emission reductions for the monitoring period and calculated according to the applied methodologies as follows: $ER_y = BE_y - PE_y - L_y$ $= 19,370 - 0 - 0 = 19,370 \text{ tCO}_2\text{e}$ The ER calculation sheet and monitoring report is verified to check the calculation.
<b>Findings</b>	No finding
<b>Conclusion</b>	The verification team confirms the following: <ul style="list-style-type: none"> <li>The emission reduction value reported (ie, 19,370 tCO<sub>2</sub>e) is verified to be correct.</li> <li>The summary table in the MR has been filled correctly and the values are in line with the related emissions reduction spreadsheet.</li> <li>Since the monitoring period starts after 31/12/2012, the complete emission reductions are correctly reported under the respective column in the MR.</li> </ul>

### E.8.5. Comparison of actual GHG emission reductions or net anthropogenic GHG removals by sinks with estimates in registered PDD

Means of verification	The verification team has checked whether the MR includes a comparison of actual values of the monitoring period with the estimations in the registered PDD/3/. Section E.5 of the MR includes a comparison of the calculated actual emission reductions with the ex-ante calculated values in the revised approved PDD	
	Emission reduction estimated as per the registered PDD/3/	Actual emission reduction achieved as per Monitoring report/1/
	19,880 t CO <sub>2</sub> e	19,370 t CO <sub>2</sub> e
	Hence, the actual emission reduction achieved during the monitoring period is less than the estimation in the PDD.	
Findings	No finding	
Conclusion	The estimated emission reduction as per registered PDD and the actual emission reduction achieved for the monitoring period are correctly reported in the section E.5 of MR. The actual achieved emission reduction is less than the PDD estimation. Hence no justification is required.	

**E.8.6. Remarks on difference from estimated value in registered PDD**

<b>Means of verification</b>	The verification team has determined the CER achieved during this monitoring period with the estimated value and reason for increase if any.
<b>Findings</b>	No finding
<b>Conclusion</b>	The actual achieved emission reduction is less than the PDD estimation. Hence, no justification is required.

**E.8.7. Actual GHG emission reductions or net anthropogenic GHG removals by sinks during the first commitment period and the period from 1 January 2013 onwards**

<b>Means of verification</b>	The verification team has determined the CER achieved during first commitment period and second commitment period
<b>Findings</b>	No finding
<b>Conclusion</b>	Since the complete monitoring period falls after the first commitment period, the complete emission reductions (19,370 t CO <sub>2</sub> e) are correctly reported under the respective column in the MR.

**SECTION F. Internal quality control**

The draft verification report prepared by team leader is reviewed by an independent technical reviewer (having competence of relevant technical area himself/herself or through an independent technical area expert) to confirm the internal procedures established by KBS are duly followed and the verification report/opinion is reached in an objective manner and complies with the applicable CDM requirements.

The independent technical reviewer may approve or reject the draft verification report. The findings may be identified even at this stage, which needs to be satisfactorily resolved, before the request for issuance is submitted to UNFCCC. The final decision is taken by the Manager Technical and Certification. The technical reviewer and Manager (Technical & Certification) can be same person.

The final decision is authorized by Managing Director, KBS once the report is approved by the Manager (Technical & Certification).

**SECTION G. Verification opinion**

The verification team confirms that the evidence is of sufficient quantity, appropriate quality and reliable. The reported values, notation, units and sources in the monitoring report for all the monitoring parameters have been cross checked with the emission reduction sheet and monitoring report. During the course of verification and on site visit, the data submitted by PP was cross verified with the values mentioned in the emission reduction sheet/2/ and monitoring report/1/. The procedure for data monitoring, recording, transfer and compilation was also verified and found in compliance with the monitoring plan as mentioned in the revised PDD submitted for PRC validation/3/.

Evidences (Documents/interview/site visit) referred for verification of individual monitoring parameter and fixed parameters are defined in section E.6 above. It is confirmed by the assessment team that the reported emission reductions have been conservatively calculated. A list of referred documents for verification is also included in Appendix 3 of this report.

Based on the information seen and evaluated we confirm that the implementation of the project has resulted in 19,370 tCO<sub>2</sub>e emission reductions during period 01/12/2014 – 31/12/2015.

**SECTION H. Certification statement**

KBS Certification Services Pvt. Ltd. has been contracted by 'Senok Wind Resource Pvt. Ltd.' to undertake independent verification and certification for the greenhouse gas (GHG) emission reductions reported from the CDM Project activity "Mampuri Wind Power Project3" and UNFCCC Reference Number 9990 for the monitoring period 01/12/2014 – 31/12/2015 (including both dates) in the Monitoring Report Version 01 (first version) dated 19/05/2016.

The verification is based on the approved revised PDD and the monitoring report for this project. Our verification approach was based on the requirements as defined under the Kyoto Protocol, Marrakech accord, as well as those defined by the CDM Executive Board.

The management of the 'Senok Wind Resource Pvt. Ltd' is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions on the basis set out within the project Final

Monitoring Report Version 02.2 dated 09/02/2017. The calculation and determination of GHG emission reductions from the project is the responsibility of the management of the 'Senok Wind Resource Pvt. Ltd'. The development and maintenance of records and reporting procedures are in accordance with the Monitoring Report Version 02.2 dated 09/02/2017.

It is our responsibility to express an independent GHG verification opinion on the GHG emissions and on the calculation of GHG emission reductions from the project for the monitoring period 01/12/2014 – 31/12/2015 (including both dates) based on the reported emission reductions in the Final Monitoring Report Version 02.2 dated 09/02/2017 for the same period.

Based on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these, KBS planned and performed our work to obtain the information and explanations that we considered necessary to provide sufficient evidence for us to give reasonable assurance that this reported amount of GHG emission reductions for the period is fairly stated.

KBS confirms the following;

**Reporting period:** 01/12/2014 – 31/12/2015 (including both dates)

**Verified and certified emission in the above reporting period:**

	Amount	Unit
Baseline emissions (BE)	19,370	tCO <sub>2</sub> e
Project emissions (PE)	0	tCO <sub>2</sub> e
Leakage emissions (LE)	0	tCO <sub>2</sub> e
Certified emission reductions (CERs)	19,370	tCO <sub>2</sub> e

## Appendix 1. Abbreviations

Abbreviations	Full texts
BE	Baseline Emissions
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM EB	CDM Executive Board
CEB	Ceylon Electricity Board
CERs	Certified Emission Reductions
CH <sub>4</sub>	Methane
CL	Clarification Request
CO <sub>2</sub> e	Carbon dioxide equivalent
COP	Conference of Parties
CMP	Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol
DNA	Designated National Authority
DOE	Designated Operational Entity
EF	Emission Factor
ERPA	Emission Reduction Purchase Agreement
ERs	Emission Reductions

FAR	Forward Action Request
GHGs	Greenhouse Gas(es)
GWP	Global Warming Potential
ISO	International Organization of Standardization
IPCC	Intergovernmental Panel on Climate Change
KBS	KBS Certification Services Pvt. Ltd.
KP	Kyoto Protocol
LE	Leakage Emissions
MR	Monitoring Report
MP	Monitoring Plan
NGO	Non Governmental Organisation
OP	Operating Procedure
PE	Project Emissions
PDD	Project Design Document
PS	Project Standard
PCP	Project Cycle Procedure
SPPA	Small Power Purchase Agreement
SWEPL	Senok Wind Energy (Private) Limited
QA/QC	Quality Assurance/Quality Control
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Validation & Verification Standard
WTG	Wind Turbine Generator

## Appendix 2. Competence of team members and technical reviewers

<b>Personnel Name:</b>		<b>Narendra Kumar</b>	
<b>Qualified to work as:</b>			
Team Leader	<input checked="" type="checkbox"/>	Technical Expert	<input checked="" type="checkbox"/>
Validator/Verifier	<input checked="" type="checkbox"/>	Financial Expert	<input checked="" type="checkbox"/>
Technical Reviewer	<input checked="" type="checkbox"/>	Local Expert	<input checked="" type="checkbox"/>
<b>Area(s) of Technical Expertise</b>			
<b>Sectoral Scope</b>	<b>Technical Area</b>		
Energy Industries (renewable/non-renewable sources)	TA 1.1: Thermal energy generation from fossil fuels and biomass including thermalelectricity from solar		
Energy industries (renewable/non-renewable sources)	TA 1.2: Energy generation from renewable energy sources		
Energy Demand	TA 3.1: Energy Demand		
Approved by (Manager C& T)	Akhilesh Joshi		
Approval date:	16/01/2016		

<b>Personnel Name:</b>	<b>Chetan Swaroop Sharma</b>
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Qualified to work as:			
Team Leader	<input checked="" type="checkbox"/>	Technical Expert	<input checked="" type="checkbox"/>
Validator/Verifier	<input checked="" type="checkbox"/>	Financial Expert	<input checked="" type="checkbox"/>
Technical Reviewer	<input checked="" type="checkbox"/>	Local Expert (India)	<input checked="" type="checkbox"/>
Area(s) of Technical Expertise			
Sectoral Scope	Technical Area		
Energy industries (renewable/non-renewable sources)	TA 1.2: Energy generation from renewable energy sources		
	TA 1.1: Thermal energy generation from fossil fuels and biomass including thermal electricity from solar		
Approved by (Manager C & T)	Gagandeep Kakkar		
Approval date:	09/10/2015		

Personnel Name:		Pathmanatha Poddiwala	
Qualified to work as:			
Team Leader	<input type="checkbox"/>	Technical Expert	<input type="checkbox"/>
Validator/Verifier	<input type="checkbox"/>	Financial Expert	<input type="checkbox"/>
Technical Reviewer	<input type="checkbox"/>	Local Expert (Srilanka)	<input checked="" type="checkbox"/>
Area(s) of Technical Expertise			
Sectoral Scope	Technical Area		
N/A	N/A		
Approved by (Manager C & T)	Mayank Kumar Jain		
Approval date:	26/06/2012		

Personnel Name:		Sanjay Kandari	
Qualified to work as:			
Team Leader	<input checked="" type="checkbox"/>	Technical Expert	<input checked="" type="checkbox"/>
Validator/Verifier	<input checked="" type="checkbox"/>	Financial Expert	<input checked="" type="checkbox"/>
Technical Reviewer	<input checked="" type="checkbox"/>	Local Expert (India)	<input checked="" type="checkbox"/>
Area(s) of Technical Expertise			
Sectoral Scope	Technical Area		
Energy Industries (renewable/non-renewable sources)	TA 1.1: Thermal energy generation from fossil fuels and biomass including thermal electricity from solar		
Energy industries (renewable/non-renewable sources)	TA 1.2: Energy generation from renewable energy sources		
Waste Handling and Disposal	TA 13.1 Waste Handling and Disposal TA 13.2 Manure		
Approved by (Manager C & T)	Gagandeep Kakkar		
Approval date:	03/11/2015		

## Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	SWRPL	Monitoring Report,	Version 01, dated 19/05/2016	SWRPL
	SWRPL	Monitoring Report	Version 02 dated 12/09/2016	SWRPL
	SWRPL	Monitoring Report	Version 02.1, dated 09/12/2016	SWRPL
	SWRPL	Monitoring Report	Version 02.2, dated 09/02/2017	SWRPL
2	SWRPL	ER Calculation Sheet	Version 01, dated 19/05/2016	SWRPL
	SWRPL	ER Calculation Sheet	Version 02.2, dated 09/02/2017	SWRPL
3	SWRPL	Registered PDD	<a href="#">Version 4, 30/06/2014</a>	Publically available
	SWRPL	Revised PDD (Submitted for PRC validation)	Version 5, dated 05/12/2016	Publically available
4	KBS	Validation Report	<a href="#">Dated 17/07/2014</a>	Publically available
5	UNFCCC	Project webpage	<a href="#">Web link</a>	Publically available
6	UNFCCC	AMS-I.D - Grid connected renewable electricity generation	<a href="#">Version 17</a>	Publically available
7	IPCC	1. 1996 IPCC Guidelines for National Greenhouse Gas Inventories: work book 2. 2006 IPCC Guidelines for National Greenhouse Gas Inventories: work book	<a href="#">Web link</a>	Publically available
8	UNFCCC	Kyoto Protocol (1997)	<a href="#">Web link</a>	Publically available
9	UNFCCC	Monitoring Report Form (CDM-MRFORM), Version 05.1	<a href="#">Version 05.1</a>	Publically available
10	UNFCCC	CDM Project Standard	<a href="#">Version 9.0</a>	Publically available
11	UNFCCC	CDM Validation and Verification Standard	<a href="#">Version 09</a>	Publically available
12	UNFCCC	Glossary "CDM terms"	<a href="#">Version 08</a>	Publically available
13	CEB	Commissioning Certificate	Commissioning date 19/05/2014	SWRPL
14	Suzlon	Technical Specification of WTG	-	SWRPL
15	CEB & SWRPL	Small Power Purchase Agreement (SPPA) signed between SWPL and CEB	Dated 26/07/2011	SWRPL
		Addendum to the SPPA	Dated 31/07/2013	SWRPL
16	SWRPL & CEB	Invoices for the electricity sale to CEB	-	SWRPL
	SWRPL	Export register	-	SWRPL
17	CEB	Monthly electricity bill issued by CEB	-	SWRPL
	SWRPL	Electricity import register	-	SWRPL
18	CEB	Calibration Certificates of energy meters	-	SWRPL
19	KBS	PRC Validation report	Version 02, dated 13/02/2017	NA



## Appendix 4. Clarification requests, corrective action requests and forward action requests

Table 1. Remaining FAR from validation and/or previous verification

FAR ID	xx	Section no.	E.2	Date:DD/MM/YYYY
Description of FAR				
NA				
Project participant response				Date:DD/MM/YYYY
Documentation provided by project participant				
DOE assessment				Date:DD/MM/YYYY

Table 2. CL from this verification

CL ID	01	Section no.	E.3	Date:11/07/2016
Description of CL				
MR-View page: The estimated emission reduction is calculated based on the number of months in the monitoring period. Clarify why the same is not calculated based on the total number of days in the monitoring period which is more appropriate.				
Project participant response				Date:25/09/2016
This has been amended on the MR				
Documentation provided by project participant				
Revised monitoring report				
DOE assessment				Date:10/11/2016
The estimated emission reduction is now calculated based on the actual operating days. Hence OK. Finding is closed.				

CL ID	02	Section no.	E.6.2	Date:11/07/2016
Description of CL				
MR-Section D.2: As per registered PDD, the accuracy class of energy meter is 0.1s. However, actual accuracy class of energy meter installed in the site is 1. The monitoring report also specifies the accuracy class as 1. Clarify				
Project participant response				Date: 25/09/2016
This has been erroneously mentioned. The monitoring report has been amended to reflect the actual meter on site, which reads an accuracy class of 1. Moreover, the energy meter is not in the control of PP; but in the control of CEB. Since this is a change in registered monitoring plan, the same is corrected in the PDD and the revised PDD is submitted to DOE as a part of post registration change.				
Documentation provided by project participant				
The CEB Meter test reports confirm the same Revised PDD				
DOE assessment				Date: 10/11/2016
Since the PP is using lower accuracy class for the actual monitoring, this needs to be reported in the PDD as post registration change. Since the energy is meter is not in the control of PP, the prior approval of post registration change is not necessary. The validation assessment of post registration change is provided separately in the PRC validation report. Finding is closed.				

CL ID	03	Section no.	E.6.2	Date:	11/07/2016
<b>Description of CL</b>					
MR-Section D.2: It is mentioned that the backup meter (M2B) is installed to measure the electricity imported from grid (EG <sub>imp,y</sub> ). Clarify whether the backup meter installed at the main panel will record import readings also.					

<b>Project participant response</b>	<b>Date:</b> 25/09/2016
The backup meter (M2B) will not record the import readings, however all power requirements for the WTGs are recorded via the SCADA system of the WTG. The monitoring report is corrected accordingly.	
<b>Documentation provided by project participant</b>	
Revised monitoring report.	
<b>DOE assessment</b>	<b>Date:</b> 10/11/2016
The backup meter will not record the import readings. PP has corrected the same in the monitoring report. Hence OK. Finding is closed.	

Table 3. CAR from this verification

<b>CAR ID</b>	01	<b>Section no.</b>	E.6.1	<b>Date:</b> 11/07/2016
<b>Description of CAR</b>				
MR-Section D.1				
1. The parameter indication for 'Simple Operating Margin Emission Factor' is not correct 2. The value of operating margin provided is not consistent with the registered PDD.				
<b>Project participant response</b>				<b>Date:</b> 25/09/2016
The Monitoring report has been amended to reflect the correct figures				
<b>Documentation provided by project participant</b>				
Revised MR				
<b>DOE assessment</b>				<b>Date:</b> 10/11/2016
1. The parameter notation for 'Simple Operating Margin Emission Factor' is corrected. 2. The value of operating margin is corrected to 0.7037 tCO <sub>2</sub> e/MWh which is consistent with the registered PDD. Finding is closed				

<b>CAR ID</b>	02	<b>Section no.</b>	E.6.2	<b>Date:</b> 11/07/2016
<b>Description of CAR</b>				
MR-Section D.2				
3. The description of parameters is not in line with the registered PDD 4. The description of monitoring plan is not consistent with the description provide in the registered PDD.				
<b>Project participant response</b>				<b>Date:</b> 25/09/2016
The monitoring plan has been amended accordingly				
<b>Documentation provided by project participant</b>				
Revised MR				
<b>DOE assessment</b>				<b>Date:</b> 10/11/2016
1. The description of the parameter is corrected to be in line with the PDD 2. The description of monitoring plan is corrected to be consistent with the description provided in the PDD. Finding is closed.				

<b>CAR ID</b>	03	<b>Section no.</b>	E.7	<b>Date:</b> 11/07/2016 Reopen 07/02/2017
<b>Description of CAR</b>				
ER calculation sheet 1: From the verification of calibration reports, it is observed that the calibration of the energy meter is not done within the required frequency (ie, 1 year). However, the maximum possible error is not applied to the energy export & import values during the gap period also the formula for net electricity supplied to grid is incorrectly applied.				
<b>Project participant response</b>				<b>Date:</b> 09/02/2017
The monitoring plan and generation calculation has been amended accordingly.				
<b>Documentation provided by project participant</b>				

Revised ER calculation sheet Revised Monitoring report	
<b>DOE assessment</b>	<b>Date:</b> 13/02/2017
For the calibration gap period from 27/03/2015 to 02/09/2015, the maximum possible error of 1% is applied for both export and import. From recorded export reading, 1% is deducted and from the recorded import reading 1% is added. The same is verified and found to be appropriate and in line with the requirement of project standard. The revised emission reduction due to reduction in the generation is correctly reported in the revised monitoring report. Finding is closed	

Table 4. FAR from this verification

<b>FAR ID</b>	xx	<b>Section No.</b>		<b>Date:</b> DD/MM/YYYY
<b>Description of FAR</b>				
NA				
<b>Project participant response</b>				<b>Date:</b> DD/MM/YYYY
<b>Documentation provided by project participant</b>				
<b>DOE assessment</b>				<b>Date:</b> DD/MM/YYYY

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## Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
01.0	23March 2015	Initial publication.
Decision Class: Regulatory Document Type: Form Business Function: Issuance Keywords: project activities, verifying and certifying		