VERIFICATION REPORT

for the Post Registration Changes of the CDM Project Activity

Revision of Monitoring Plan

1.5 MW Grid connected Wind Electricity Generation at Tirunelveli District, Tamilnadu, India by Kallam Agro Products and Oils Private Limited

In

INDIA

Report No. 019979105071816

Version 01, 2013-02-15

Designated Operational Entity (DOE)

TÜV Rheinland (China) Ltd

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I. Project data:

Project title:	1.5 MW Grid connected Wind Electricity Generation at Tirunelveli District, Tamilnadu, India by Kallam Agro Products and Oils Private Limited	**Report No.: 019979105071816**
Registration No. / Date:	2770/2009-12-15	**Current revision No.: 01**
Monitoring period:	NA	**Date of current revision: 2013-02-15**
Methodology:	AMS-I.D, Version 13 "Grid connected renewable electricity generation"	**Date of first issue: 2013-02-04**
Publication of MR:	The monitoring report (version 01, 2012-09-14) was published at UNFCCC website on 2012-09-21.	
Average emission reductions:	Estimated: 3,796 tCO_2e/yr	Verified: NA
GHG reducing measure/technology:	*Electricity generation by renewable wind energy resource*	

Party	Project participants	Party considered a project participant	Contract party
Government of India (Host)	Kallam Agro Products & Oils (P) Ltd	No	☒

II. Verification Team:

Verification Team			Role									
Full name	**Affiliation TÜV Rheinland**	**Appointed for Sectoral Scopes (Technical Areas)**	Team leader	Acting Team Leader	Local Expert	Team Member (Auditor)	Technical Expert	Acting Tech. Expert	Trainee Auditor	Technical Reviewer	Expert to TR	Trainee TR
Mr. R. Murali	India	1.2, 3.1	**X**		**X**		**X**					
Ms. Indumathi	India	1.2								**X**		

III. Verification Report:

Verification Phases:

☒ Desk Review ☒ Follow up interviews ☒ Resolution of outstanding issues

Verification Status:

☐ Corrective Actions / Clarifications Requested ☒ Full Approval and Submission for Approval ☐ Rejected

III. Verification Report:

Final approval	Released	Distribution
☒	**By: Mr. Praveen Urs**	☐ No distribution without permission from the Client or responsible organizational unit
Date: 2013-02-18		☒ Unrestricted distribution

Abbreviations

AMS	Approved Methodology Small Scale
BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM EB	CDM Executive Board
CEA	Central Electricity Authority
CM	Combined Margin
CDM PCP	Clean Development Mechanism Project Cycle Procedure
CDM PS	Clean Development Mechanism Project Standard
CDM VVS	CDM Validation and Verification Standard
CER	Certified Emission Reduction(s)
CH_4	Methane
CL	Clarification request
CO_2	Carbon dioxide
CO_{2e}	Carbon dioxide equivalent
DNA	Designated National Authority
DOE	Designated Operational Entity
FAR	Forward Action Request
GHG	Greenhouse Gas(es)
GWP	Global Warming Potential
HAWT	Horizontal Axis Wind Turbine
IPCC	Intergovernmental Panel on Climate Change
MoC	Modalities of Communication
MoEF	Ministry of Environment and Forest
MP	Monitoring Plan
MR	Monitoring Report
OM	Operating Margin
PDD	Project Design Document
PLF	Plant Load Factor
PP	Project Participant
TANTRANSCO	Tamil Nadu Transmission Corporation Ltd
TNEB	Tamil Nadu Electricity Board
TEDA	Tamil Nadu Energy Development Agency
TNERC	Tamil Nadu Electricity Regulatory Commission
TUV R	TUV Rheinland (China) Ltd
TUF	Technology Upgradation Fund
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Validation And Verification Standard
WTG	Wind Turbine Generator

Verification opinion — summary

The verification team of the DOE (TÜV Rheinland (China) Ltd.) is assigned by "Kallam Agro Products & Oils (P) Ltd" to perform the verification of post registration changes of the CDM Project Activity "1.5 MW Grid connected Wind Electricity Generation at Tirunelveli District, Tamilnadu, India by Kallam Agro Products and Oils Private Limited" in India, as described in the registered PDD (version 03, 2009-12-11) as well as updated PDD (Version 04, 2012-01-15) meet all relevant requirements of the UNFCCC for CDM project activities including CDM VVS. Hence this request is to perform the independent and objective verification for "Revision of Monitoring Plan".

Verification methodology and process

The verification has been performed as described in the VVS version 03.0 and constitutes the following steps:

- Review of the Registered PDD version 03, dated 2009-12-11
- Publication of the MR on the UNFCCC website (2012-09-21 – 2012-10-11)
- Desk review of the MR, version 01 and the relevant documents
- On-site assessment (2012-10-13)
- Validation Report version 01, dated 2009-07-13

The verification team is able to confirm that the revised monitoring plan is in line with the actual site condition which ensures the level of accuracy and completeness. The proposed revision of the monitoring plan is in accordance with the approved monitoring methodology applicable to the project activity. No previous verification has been carried out for the project activity. Thus the DOE therefore accepts the changes and request for the approval of "Revision of Monitoring Plan".

2013-02-18	2013-02-16	2013-02-15
Date	Date	Date
Mr. Praveen Nagaraje Urs	Ms. C. Indumathi	Mr. R. Murali
DOE Manager	Technical Reviewer	Team Leader
TUV Rheinland (China) Ltd.	TUV Rheinland (India) Pvt Ltd.	TUV Rheinland (India) Pvt Ltd

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1. Introduction

The Contracting Client Organization has commissioned the DOE TÜV Rheinland (China) Ltd. to perform a verification of the Post Registration Changes to Revision of Monitoring Plan to the CDM Project Activity "1.5 MW Grid connected Wind Electricity Generation at Tirunelveli District, Tamilnadu, India by Kallam Agro Products and Oils Private Limited" in India (hereafter "project activity"). The term "UNFCCC criteria" refers to Article 12 of the Kyoto Protocol, the CDM modalities and procedures and the subsequent decisions by the CDM Executive Board. The independent Verification by the DOE is required on the Monitoring plan to confirm the post registration changes with respect to actual implementation and operation carried out by the project activity. This report summarises the post registration changes of the project with respect to VVS requirements.

1.1 Objective

Verification is the independent review and *ex post* determination of both quantitative and qualitative information of the actual implementation and operation of the project activity by a Designated Operational Entity (DOE) towards the registered monitoring plan.

The purpose of verification is to have independent third party assessment to verify that actual implementation and operations of the project activity is as defined by the registered monitoring plan and conclude the respective post registration changes in transparent manner as per VVS and CDM project cycle procedure.

1.2 Scope

The scope of the verification of post registration changes are:

- To verify whether the changes is likely to lead to a reduction in the accuracy of calculation of emission reductions ;
- To verify whether the information's provided in the registered PDD and Monitoring plan comply with that of actual implementation and operations of the project activity and in line with the applied methodology;
- To verify whether the proposed changes result in a less conservative baseline and GHG emission reduction;
- To verify whether the proposed changes would not adversely affect the conclusions of the validation report of the registered PDD with regards to Additionality, Scale, Applicability and Compliance;
- To evaluate the GHG emission reduction data and express a conclusion with a reasonable level of assurance about whether the reported GHG emission reduction data is free from material misstatement.

The verification shall ensure that reported changes and information's are substantial, complete and accurate with sufficient supportive evidence in order to reach the verification conclusion.

2. Methodology

The verification consists of the following four phases:
1. Completeness check;
2. Desk review of all relevant documents;
3. On-site visit (when deemed necessary);
4. Final Verification statement.

The following sections outline each step in more detail.

2.1 Desk review

The following table outlines the documentation reviewed during the verification:

Ref no.	*Reference Document*
/P01/	Monitoring report, version 01 dated 2012-09-14 for the monitoring period from 2009-12-15 to 2011-12-20.
/P02/	Emission reduction spread sheet version 01 w.r.t webhosted MR, version 01.
/P03/	Monthly TNEB statements for the current monitoring period for the HTSC no: 2543, the TNEB statement from 2009-12-15 to 2011-12-20.
/P04/	Site visit data collection and photograph taken during the site visit on 2012-10-13. The data collections are as follows: • Interview with Suzlon Infrastructure Services Limited (SISL) personnel, and consultant (Zenith Energy) about the collection, archiving, storage of data w.r.t electricity generation, invoicing procedure and enquiry on any change in monitoring personnel/monitoring equipment. • Training procedures and training records of monitoring personnel's of SISL • Details of energy meters such as make, accuracy class, serial number, daily recordings etc • HTSC number and survey number • Calibration procedures by state utility • QA/QC measures adopted by Suzlon Infrastructure Services Limited (SISL) • Emergency preparedness and incidents such as downtime, forces shut down etc. • Discussion about SCADA operation and online recording of data. • Cross checking the SCADA data at CMS for project participant and their WTG included in this project activity.
/P05/	Technical specification of technical specification for 1500kW WTG of Suzlon Energy Limited make WTG
/P06/	Energy Purchase Agreement between Kallam Agro Products & Oils (P) Ltd and Tamil Nadu Electricity Board (TNEB) dated 2008-03-28 for HTSC No.2543
/P07/	• Track change mode revised PDD, version 04 dated 2013-01-15 for the project titled "1.5 MW Grid connected Wind Electricity Generation at Tirunelveli District, Tamilnadu, India by Kallam Agro Products and Oils Private Limited**Error! No text of specified style in document.**" • Clean mode revised PDD, version 04 dated 2013-01-15 for the project titled "1.5 MW Grid connected Wind Electricity Generation at Tirunelveli District, Tamilnadu, India by Kallam Agro Products and Oils Private Limited"

Background investigation and other referred documents/websites:

Reference	Document

Reference	Document
/B01/	Approved monitoring methodology: AMS-I.D. "Grid connected renewable electricity generation", version 13
/B02/	Kyoto Protocol (1997)
/B03/	Decision 3/CMP. 1 (Marrakesh – Accords)
/B04/	Registered PDD version no 03, dated 2009-12-11, Registration no. 2770, Registration date 2009-12-15 (http://cdm.unfccc.int/filestorage/O/3/A/O3ABYNUV1Z2F506S4W7CTLDHKIMJPQ/PDD-%20Clean%20-Kallam%20-%20185.49?t=aWN8bWgybHU3fDAJem_eqaJDKFEHPdTdhQsm)
/B05/	Final validation REPORT NO. INDIA/VAL/185.49/2009 & INDIA-VAL/159/2009, dated 2009-07-13, version 01 (http://cdm.unfccc.int/filestorage/3/Y/7/3Y7W0E9ORHDXJZILKTNQUBA2FM841S/Validation%20Report%20-%20Clean%20-%20Kallam%20-%20185.49?t=dEN8bWgybHczfDByK5T1VdkydaHDWJhjlAIA)
/B06/	UNFCCC Validation and Verification Standard version 03 (http://cdm.unfccc.int/Reference/Standards/accr_stan02.pdf)
/B07/	E-mail from UNFCCC Secretariat confirming the monitoring report made publically available from 2012-09-21
/B08/	http://cdm.unfccc.int/index.html
/B09/	Websites referred 1. http://cdm.unfccc.int/methodologies/SSCmethodologies/approved.html 2. http://www.itouchmap.com/latlong.html (Latitude-Longitude location finder)
/B10/	/EB26/- EB 26 meeting report paragraph 109 (http://cdm.unfccc.int/EB/026/eb26rep.pdf)
/B11/	/EB48-A68/- Completeness check issuance (http://cdm.unfccc.int/EB/048/eb48_repan68.pdf)
/B12/	/EB 52-A 60/- Guidelines for assessing compliance with the calibration frequency requirements (http://cdm.unfccc.int/EB/052/eb52_repan60.pdf)
/B13/	EB 52 meeting report (http://cdm.unfccc.int/EB/052/eb52rep.pdf)
/B14/	http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm, Central Electricity Authority CO_2 database, Ministry of power, Government of India.

2.2 On-site visit

TÜV Rheinland verification team carried out an on-site visit dated (2012-10-13) and performed interviews with the project representatives and stakeholders. The action items covered during the site visit include, but are not limited to:

- The on-site assessment included an investigation of whether all relevant equipment's are installed and works as anticipated in the registered PDD.
- Assessment of any permanent changes in the project activity in comparison with the registered PDD.

- The operating staff was interviewed and observed in order to check the risks of inappropriate operation and data collection procedures.
- The on-site visit to check that the data recorded and stored as per the monitoring plan.
- Information flows for generating, aggregating and reporting the selected monitored parameters were reviewed.
- Check monitoring equipment's including calibration performance.
- Cross-check the information provided in the MR documentation with other sources (raw data).
- The monitoring practices were checked to comply with the requirements of the Registered PDD and the selected methodology.
- The data aggregation trails were checked via spot sample down to the level of the meter recordings.
- Calculations and assumptions made in determining the GHG data and emission reductions were reviewed.
- An identification of quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters.

Prior to the interview salient points to be discussed were planned. Date of interview, interviewee and points discussed are given in the following table.

During the on-site visit, a number of persons were interviewed. Date of interview, interviewee and points discussed are given in the following table,

	Date	Name	Organization	Topic
/I-01/	2012-10-13	Mr. R.K.S. Pillai	Assistant Manager, Customer Relation Manager, Suzlon	Discussion on implementation of the project activity, organization structure, internal audit and monitoring roles and responsibilities. Discussion on the monitoring procedure for each parameter and the measurement technique including Information flow (from data generation, aggregation, to recording, calculation and reporting), SCADA operation, emergency preparedness, metering.
	2012-10-13	Mr. M. Aloysius Gnanaraj	Engineer, Operation and Maintenance of Suzlon	
	2012-10-13	Mr. Gabiriel Robinson	Junior Engineer, Operation and Maintenance, Suzlon	
/I-02/	2012-10-13	Ms. Sireesha	Consultant, Zenith Energy	Discussion on the monitoring report in particular compliance of implemented monitoring plan with the applied monitoring methodology and the registered monitoring plan including data cross check for each parameter and discussion on final reporting of the monitoring parameters. Discussion on the monitoring procedure for each parameter and the measurement technique including Information flow. QA/QC procedures, training.

Verification Team along with onsite observation, objective evidence collections, data generation and recording analysis also considered the views obtained in these interviews while arriving at Verification Opinion on revision of Monitoring plan.

2.3 Internal quality control

The final verification report underwent a technical review by a qualified independent reviewer before requesting issuance of the project activity. The technical review was performed by a technical reviewer qualified in accordance with TÜV Rheinland's qualification scheme for CDM validation and verification that meets the criteria of EB guidelines for qualification.

2.4 Verification Team

Before the assessment begins, members of the verification team are ensured to cover the technical area(s), Sectoral scope(s) and relevant host country experience including local language ability for evaluating the CDM verification activity. The qualification of the team is as per the criteria's defined by the EB guidelines for qualification.

Verification Team			Type of Involvement						
Full name	**Affiliation TÜV Rheinland**	**Appointed for Sectoral Scopes (Technical Areas)**	Supervising the work	Desk review	Site Visit + Interview	Report Writing	Technical Expert Input	Reporting Support	Technical Reviewer
Mr. R. Murali	India	1.2, 3.1	X	X	X	X	X		
Ms. Indumathi	India	1.2, 3.1							X

3. DESCRIPTION OF POST REGISTRATION CHANGES

3.1 Changes to the Registered Monitoring Plan or Monitoring Methodology

Herewith, the verification team summarizes the post registration changes between registered monitoring plan and actual project monitoring activity:

Post registration change in the monitoring plan **Description of the proposed or actual changes as compared to the description in the registered monitoring plan**	
Description in monitoring plan of the registered PDD or approved monitoring methodology	**Correction to the monitoring plan of the registered PDD based on the actual monitoring in the project activity with DOE assessment and reason of acceptance**
Section B.7.1 of the registered PDD: **EG_y** - Net electricity generated and delivered to the grid by the project activity during the year y **Data Unit:** MWh/annum **Source of data to be used:** Statement showing the Energy Generated through wind mill issued by Tamil Nadu Electricity Board (TNEB) **Description of measurement methods and procedures to be applied:** Electricity generated will be measured at the grid interconnection point using energy meters. For billing purpose, the meter readings are taken every month by TNEB officials in the presence of company representatives and the readings are jointly certified. **QA/QC procedures to be applied:** The Meters used for reading will be calibrated as per industry standards of host country as described under Sec.B.7.2. **Any Comments:** The data will be archived for two years after the crediting period, or of the last issuance of CER's of this project activity.	**Section B.7.1 of the revised PDD:** **EG_y** - Net electricity exported to the grid by the project activity during the year y **Data Unit:** MWh/Year **Source of data to be used:** Statement showing the electricity exported to the grid and imported from the grid issued by Tamil Nadu Electricity Board (TNEB) **Description of measurement methods and procedures to be applied:** Electricity exported & imported will be measured using energy meters. For billing purpose, the meter readings are taken every month by TNEB officials in the presence of company representatives and the readings are jointly certified. The Net electricity exported to the grid by the project activity will be calculated as the difference between electricity exported to grid and electricity imported from grid. **QA/QC procedures to be applied:** The Meter(s) used for reading electricity export & import will be calibrated atleast once in a year as per the energy purchase agreement (EPA)/ power purchase agreement (PPA). Net electricity exported to the grid can be cross checked with sales invoices/bills of electricity export and import. **Any Comments:** The data will be archived for two years after the crediting period, or of the last issuance of CER's of this project activity.

Whichever occur later.	Whichever occur later. The DOE based on the review of monitoring plan of the revised PDD concludes that the usage of correct wordings/terminology to the data parameter, data unit, and source of data to be used, description of measurement mentioned and procedures to be applied, QA/QC for the monitoring parameter ($EG_{y)}$ does not affect the level of accuracy however the revision make the monitoring plan more transparent and complete. The PP has corrected the word «Electricity Generated and delivered» to «Electricity export» in the revised PDD. In addition to that the description of net electricity exported to the grid is clearly explained as the difference between Electricity exported to the grid and electricity imported from the grid which is in line with the procedures followed while measuring the readings in the monthly statement issued by TNEB. The proposed revision doesn't affect the frequency of measurements which remains same as continuously monitored and monthly recorded, quality of monitoring equipment which remains same as 0.5 accuracy class, frequency of calibration which remains same as once in a year, and the quality assurance and quality control procedures as per the revised PDD. Based on the information collected during the site visit and review of evidence such as monthly joint meter reading, calibration report, EPA/PPA it is concluded that the parameter EG_y mentioned in the revised PDD is in line with the monitoring plan of actual site condition.

Section B.7.1 of the registered PDD:	Section B.7.1 of the revised PDD:
$EG_{export,y}$ – Not included in the registered PDD.	**$EG_{export,y}$** - The electricity exported to the grid during the year ,y **Data Unit:** MWh/Year **Source of data to be used:** Statement showing the electricity exported to the grid issued by Tamil Nadu Electricity Board (TNEB) **Description of measurement methods and procedures to be applied:** The electricity exported will be measured using energy meter(s) at grid which are under the control of TNEB. The readings are taken every month by TNEB officials in the presence of company representatives. **QA/QC procedures to be applied:** The Meters used for reading will be calibrated at least once in a year as per the energy purchase agreement (EPA) / power purchase agreement (PPA) **Any Comments:** The data will be archived for two years after the crediting period, or of the last issuance of CER's of this project activity. Whichever occur later. The DOE based on the review of monitoring plan of the revised PDD concludes that including of the monitoring parameter $EG_{export,y}$ is more appropriate to calculate the parameter $EG_{y.}$ Explanation regarding data parameter, data unit, source of data to be used, description of measurement mentioned and procedures to be applied, QA/QC for the monitoring parameter ($EG_{export,y)}$ does not affect the level of accuracy however it improves the monitoring plan more transparent and complete. The PP has included a table for the electricity exported to the grid during the year ,y in the revised PDD which is verified and found to be correct. The proposed revision doesn't affect the frequency of measurements which remains same as continuously monitored and monthly recorded, quality of monitoring equipment which remains same as 0.5 accuracy class, frequency of calibration which remains same as once in a year, and the quality assurance and quality control procedures as per the revised PDD. Based on the information collected during the site visit and review of evidence such as monthly joint meter reading, calibration report, EPA/PPA it is

	concluded that the parameter $EG_{export,y}$ mentioned in the revised PDD is in line with the monitoring plan of the actual site condition.

Section B.7.1 of the registered PDD:	Section B.7.1 of the revised PDD:
$EG_{import,y}$ - The electricity imported from the grid during the year y	**$EG_{import,y}$** - The electricity imported from the grid during the year ,y
Data Unit: MWh/year	**Data Unit:** MWh/Year
Source of data to be used: Statement showing the Energy Generated through wind mill issued by Tamil Nadu Electricity Board (TNEB)	**Source of data to be used:** Statement showing the electricity imported from the grid issued by Tamil Nadu Electricity Board (TNEB)
Description of measurement methods and procedures to be applied: The energy imported will be measured using energy meter at grid interconnection point which is under the control of TNEB. The readings are taken every month by TNEB officials in the presence of company representatives.	**Description of measurement methods and procedures to be applied:** The electricity imported will be measured using energy meter(s) at grid which are under the control of TNEB. The readings are taken every month by TNEB officials in the presence of company representatives.
QA/QC procedures to be applied: The Meters used for reading will be calibrated as per industry standards of host country as described under Sec.B.7.2.	**QA/QC procedures to be applied:** The Meters used for reading will be calibrated at least once in a year as per the energy purchase agreement (EPA) / power purchase agreement (PPA).
Any Comments: The data will be archived for two years after the crediting period, or of the last issuance of CER's of this project activity. Whichever occur later.	**Any Comments:** The data will be archived for two years after the crediting period, or of the last issuance of CER's of this project activity. Whichever occur later. The DOE based on the review of monitoring plan of the revised PDD concludes that corrected explanation to the monitoring parameter $EG_{import,y}$ is more appropriate to calculate the parameter $EG_{y.}$ Explanation regarding data parameter, data unit, source of data to be used, description of measurement mentioned and procedures to be applied, QA/QC for the monitoring parameter ($EG_{import,y)}$ does not affect the level of accuracy however improves the transparency and completeness of the monitoring plan. The PP has done few correction to the electricity import table for the parameter $EG_{import,y}$ in the revised PDD which is verified and found to be appropriate and correct. The proposed revision doesn't affect the frequency of measurements, quality of monitoring equipment, frequency of calibration, and the quality assurance and quality control procedures. Based on the information collected during the site visit and review of evidence such as monthly joint meter reading, calibration report, EPA/PPA it is

	concluded that the parameter $EG_{import,y}$ mentioned in the revised PDD is in line with the monitoring plan of the actual site condition.

Section B.7.1 of the registered PDD:	Section B.7.1 of the revised PDD:
$EG_{LSC,y}$ - Electricity generated by wind mill during the year y	**$EG_{LSC,y}$** - Electricity generated by wind mill during the year y
Data Unit: MWh/annum	**Data Unit:** MWh/year
Source of data to be used: Data recorded from the Controller at the wind mill (by the aid of SCADA)	**Source of data to be used:** As per statement of monthly generation issued by the Operation & Maintenance (O & M) operator
Description of measurement methods and procedures to be applied: Electricity generated will be recorded daily and aggregated monthly.	**Description of measurement methods and procedures to be applied:** Electricity generated will be recorded daily and aggregated monthly.
QA/QC procedures to be applied: In case of any inconsistency or error notifying at the Controller, it will be rectified or replaced completely by the WEG supplier.	**QA/QC procedures to be applied:** The electricity generated by the WTG is recorded by a controller which is micro-processor based controller using a Woodward Multi-function Relay. Turbine cannot run without this relay hence it cannot be removed for calibration, thereby, calibration for this controller is not possible.
Any Comments: The data will be archived for two years after the crediting period, or of the last issuance of CER's of this project activity. Whichever occur later.	**Any Comments:** The parameter is included to provide data only for the apportioning. In this case of apportioning, only the electricity generation data of the project activity Wind Turbine Generator are required to be monitored. The data will be archived for two years after the crediting period, or of the last issuance of CER's of this project activity. Whichever occur later. Since the authorized TNEB monthly statement for all the WTGs located in the project region starts from 20th day and ends on 20th day, to match the start date and end date with TNEB monthly statement with the crediting period start date and end date during the fixed crediting period, the PP has introduced the parameter $EG_{LSC,y}$ during validation of the project. Though the generation data is available from SCADA software which is maintained by O&M team for the project activity, for this parameter ($EG_{LSC,y}$), PP has applied the most conservative approach to calculate part of the month energy generation for these few days (i.e., Part of the month) while calculating the emission reductions. The detailed assessment on part of the month or apportioning calculation is mentioned below sections. The revised PDD has been checked for the correction to the source of

	data parameter which mentions the value will be taken from the monthly generation report issued by O&M operator which is verified by interview with the SISL team at the project site and found to be correct. The data is derived from microprocessor based system; the calibration of such equipment is not possible as it is linked with day to day operation of wind mill. If any fault in such processor will be replaced immediately then the WTG will be restarted again for normal operation which is confirmed during the site visit by the DOE. The proposed revision doesn't affect the frequency of measurements, quality of monitoring equipment, and the quality assurance and quality control procedures. Based on the information collected during the site visit and review of evidence such as monthly generation report and QA/QC procedure of SISL it is concluded that the parameter $EG_{LSC,y}$ mentioned in the revised PDD is in line with the monitoring plan of the actual site condition.
Section B.7.2, Monitoring Organisation in the registered PDD: ii) Periodic verifications and onsite inspections to ensure the quality of the data collected by the team and initiate steps in case of any abnormal conditions vi) Aggregating the net exported energy from the project thus verified and reconciled and submission to the Board of Directors or their authorised officer for approval which will be forwarded to the independent entity DOE for verification and issuance of Certified Emission Reductions.	**Section B.7.2, Monitoring Organisation in the revised PDD:** ii) Conduct onsite inspections to ensure the quality of the data collected by the team and initiate steps in case of any abnormal conditions vi) Continuous Monitoring of the electricity export to the grid & import from the grid and aggregating the net exported energy from the project thus verified and reconciled and submission to the Board of Directors or their authorised officer for approval which will be forwarded to the independent entity DOE for verification and issuance of Certified Emission Reductions. Change of wordings to the above highlighted points and addition of continuous monitoring of the electricity export to the grid and import from the grid makes the monitoring plan more clear and transparent to the verifier for the monitoring parameters. Hence the DOE verified the revised explanation provided in the revised PDD and found to be valid and correct.
Section B.7.2, Parameters requiring monitoring in the registered PDD: This monitoring plan requires monitoring of electricity generated, delivered to grid and import	**Section B.7.2, Parameters requiring monitoring in the revised PDD:** This monitoring plan requires monitoring of electricity generated by the wind mill, export of

of electricity from TNEB grid. Necessary documents required for verification of the data will be maintained for later archiving. Using the electricity exported to the grid, emission reductions will be estimated as illustrated in Section B.6.3. Emission reductions generated by the project will be monitored at regular intervals and will be reported to the Board of Directors.	electricity to grid, import of electricity from TNEB grid and Net electricity exported to the grid. Necessary documents (like monthly generation statements and statements issued by TNEB) required for verification of the data will be maintained for later archiving. Using the monthly electricity exported to the grid & imported from grid, emission reductions will be estimated as illustrated in Section B.6.3. Emission reductions generated by the project will be monitored half yearly and will be reported to the Board of Directors. Additional information about export of electricity to the grid and net electricity exported to the grid has been added in the revised PDD to make the monitoring plan complete. The document name has been included in the revised PDD under the said paragraph to make the monitoring plan more transparent. Instead of regular interval mentioned in the registered PDD, the revised PDD clearly mentions the emission reduction monitoring frequency as half yearly which will be reported to the board of directors. The DOE verifies all the above said correction and found the revision is complete.
Section B.7.2, Recording Procedures in the registered PDD: Every month on the 20th day readings of the meter will be noted jointly by the representatives of TNEB and project proponent. The meters will be observed for its operation every day by the operator. Readings are taken from the main meters only. The meters are calibrated and kept in good condition during operation of the WTG. Generally meter failures are not likely to happen. In exceptional cases if meter fails it will be rectified/replaced within 24 hrs. Generation will not be taken into account on that particular day.	**Section B.7.2, Recording Procedures in the revised PDD:** Every month on the 20th day readings of the meter will be noted jointly by the representatives of TNEB and project proponent. The meters will be observed for its operation every day by the operator. Readings are taken from the main meter only. The meters are calibrated and kept in good condition during operation of the WTG. Generally meter failures are not likely to happen. In exceptional cases if meter fails defective for that particular period check meter reading will be considered. In case of both meters found to be defective, the bill shall be revised for the previous three months or for the exact period if known and agreed upon by both the parties, by applying the correction of the meter with lesser error. The sentence to the registered PDD has been corrected in the revised PDD and detailed procedure of emergency preparedness for recording procedures in case of failure of energy meter (s) are explained in the revised PDD under the above mentioned section. All the above changes to the registered PDD are verified against documentary evidence and found to be more

	appropriate and valid. The procedure followed by the PP during emergency preparedness is more conservative.
Section B.7.2, Uncertainties with regard to Meter failures in the registered PDD: The readings of the main meter and check meter will be cross checked for correctness and if there is any difference in the readings the defective meter will be replaced immediately. The permissible variation in the main or check meter is +/- 0.5%. The defective meter will be replaced with new one if the variation is more than the permissible variation. The meters are calibrated once in a year. Check meter readings will be considered when main meter found to be defective or stopped. The correction to data already measured / recorded by the meter which found be faulty / defective /out of calibration will be revised for the previous 3 (three) months or for the exact period if known and agreed upon by the project proponent and utility by the meter testing wing of the TNEB to the consumption registered by the meter with less error. However, for the estimation of CERs the corrections will be applied till the last calibration date.	**Section B.7.2, Uncertainties with regard to Meter failures in the revised PDD:** The readings of the main meter and check meter will be cross checked (by TNEB) for correctness and if there is any difference in the readings the defective meter will be replaced immediately. The permissible variation in the main or check meter is +/- 0.5%. The defective meter will be replaced with new one if the variation is more than the permissible variation. The meters are calibrated once in a year. Check meter readings will be considered when main meter found to be defective or stopped. In case of both meters found to be defective /out of order, the correction to data already measured / recorded by the meter which found be faulty / defective /out of calibration will be revised for the previous 3 (three) months or for the exact period if known and agreed upon by the project proponent and utility by the meter testing wing of the TNEB to the consumption registered by the meter with less error. However, for the estimation of CERs the corrections will be applied till the last calibration date. The corrections are accepted by the DOE and found to improve the completeness of monitoring plan.
Section B.7.2, Uncertainties with regard to mismatch of monitoring period with Initial and Final reading dates (Apportioning procedure) of registered PDD. Generation at Controller (MWh) (from the date of registration to the end of month) = A Total generation at Controller (MWh) = B (Total generation of particular month) % Generation from the date of registration to the end of the month = C = (A/B)*100 Generation as per TNEB (MWh) = D Generation report	**Section B.7.2, Uncertainties with regard to mismatch of monitoring period with Initial and Final reading dates (Apportioning procedure) of revised PDD.** Generation at Controller (MWh) (For the particular period) = A Total generation at Controller (MWh) = B (Total generation of particular month) % Generation for the particular period = C = (A/B)*100 Net Export for particular month as per TNEB (MWh) report = D

Generation used for calculation of emission reduction Calculations (MWh) = (D * C/100)	Net Export used for calculation of emission reduction Calculations (MWh) = (D * C/100) The following corrections to the parameter such as 'For the particular period', 'Net Export for particular month', 'Net Export' makes the monitoring plan more clear and complete. The formula used for the calculation of part of the month calculation is verified and found to be conservative. Thus the DOE concludes that the apportioning procedure will be followed and monitored only during the part of the month calculation during particular verification period of the fixed crediting period.

When was the changes occurred (after registration /prior to registration)	The changes occurred after the registration. However there is no major changes occurred to the monitoring plan or project description of the registered PDD except for the missing of the parameter $EG_{export,y}$ at the time of registration of the project activity. In addition to that the explanation to the monitoring parameter under section B.7.1 and B.7.2 are revised to suit the actual site condition and make the monitoring plan complete and transparent. Thus the PDD has been revised to include the same and the project has been applied for notification of changes to the registered monitoring plan. Moreover, the explanations provided under section B.7.1 and B.7.2 are modified to depict the actual procedures followed to monitor net electricity export to the grid which is verified and found to be valid and correct.
Reason for these changes taking place	The wordings and explanations has been corrected which is highlighted above and the parameter $EG_{export,y}$ is now added in the revised PDD. The same is verified and found to be valid and correct.
How does the changes impact on the overall operation/ability of the project activity to deliver emission reduction as stated in the registered PDD	The proposed changes to the monitoring plan don't affect the operation/ability of the project activity to deliver the emission reductions as stated in the registered PDD. Based on the review of monthly generation report, calibration report, data collected during the site visit and interview with site personnel's the above statement was concluded by the DOE.
Do these changes lead to more accuracy and conservativeness in emission reduction calculations?	The explanation provided in the revised PDD is more accurate which clearly explains the actual monitoring plan followed at the project site. There is no change in the frequency, quality of monitoring equipment, QA/QC and change in emission reductions because of this revision which is verified by the DOE based on the documentary evidence.
Do these changes is in accordance to the approved monitoring methodology?	Yes, the changes are in accordance to the approved monitoring methodology of AMS-I.D, version 13.

3.1.1 Impact on the level of accuracy of the monitoring plan

1) Accuracy and calibration

In the registered PDD, the accuracy of electricity meters was defined as 0.5 comply with the revision of MP. The proposed revision monitoring plan mainly relates to the complete and transparent explanation of the monitoring parameter as per the site condition and including one more monitoring parameter $EG_{export,y}$ under section B.7.1. The accuracy level of the meters already installed will remain unchanged with an accuracy of 0.5, which is in line with the procedures mentioned in the EPA/PPA signed with state utility. All the meters involved has been installed and maintained according to the EPA/PPA and in line with the methodology applied. Therefore, the accuracy of power meters is not changed and in line with the approved revision of monitoring plan and the EPA/PPA.

2) Completeness in monitoring:

i) Frequency of measurement

Both the registered monitoring plan and the proposed revision of monitoring plan are measured continuously and recorded on a monthly basis. Therefore the frequency of the measurement is not changed compared with the registered monitoring plan.

ii) Source of data to be used

The source of data remains same as the source mentioned in the registered monitoring plan. However the terminology has been corrected in the revised PDD for transparent understanding of source of data to be used.

iii) Description of measurement methods and procedures to be applied

Description of measurement method for the parameter Net electricity exported to the grid by the project activity during the year y is clearly mentioned as the difference between electricity exported to the grid during the year, y and electricity imported from the grid during the year, y using energy meters (Main meter and check meter) which can be cross verified from the sales invoice receipt raised by the PP to the state utility. The readings from main meter will be used for billing purpose and emergency preparedness in case of meter failure has been clearly mentioned in the revised PDD. In addition the detailed apportioning procedure is clearly mentioned in the revised PDD and the formula is verified by the DOE which is more conservative for part of the month calculation.

3) QA & QC:

The project itself has no change in term of precision of the meters, calibration intervals, monitoring process and human resource management compared with the registered MP. The validation team reviewed the QA&QC procedures remains unchanged. Thus, it is confirmed that the quality assurance and quality control procedures have been in place and comply with the requirement.

The DOE has assessed the accuracy and completeness of the proposed revision to the monitoring plan including the frequency of measurements, the quality of monitoring equipment (e.g. calibration requirements, and the quality assurance and quality control procedures) and confirmed that

completeness in the monitoring and verification process is not reduced as a result of the revision.

3.1.2 Monitoring plan in accordance with monitoring methodology

☐ TÜV Rheinland verification team confirms that the approved monitoring plan in the registered PDD is in accordance with the approved monitoring methodology applicable to the project activity, but the monitoring plan defers from the actual practice.

☒ TÜV Rheinland verification team confirms that the proposed revision of the monitoring plan is in accordance with the approved monitoring methodology applicable to the project activity.

3.1.3 Findings from the previous verification reports

☐ TÜV Rheinland verification team confirms that the findings from previous verification reports, if any, have been taken into consideration.

☒ TÜV Rheinland verification team confirms that no findings from previous verification reports have been taken into consideration.
Reason: This is the first verification for the project with monitoring period 2009-12-15 to 2011-12-20 (Both days included). Hence this criterion is not applicable.

3.1.4 Conclusion of the Verification team

TÜV Rheinland validation team concludes that the post registration changes have been assessed as per VVS requirements. It is confirmed that the revised monitoring plan conforms to the applied methodology AMS-I. D, Version 13 and the revision does not affect the level of accuracy and improved the completeness of the monitoring. Furthermore, it is confirmed that not all of the proposed changes belong to the types that do not require prior approval by the Board as specified in Appendix 1 of the Clean Development Mechanism Project Standard, version 2.1, EB 70, Annex 2. Therefore, the request for approval of the changes is submitted prior to the submission of the request for issuance according to the Clean Development Mechanism Project Cycle (Version 3.1, EB 70 Annex 4).

Appendix A

CERTIFICATES OF COMPETENCE

Qualification

Ramalingam, Murali /

Emission Trading
United Nations Framework Convention on Climate Change

(The following data is set by the certification body)

Auditor No.:
(AuditorenRegNr)

Appointed: (Zugelassen)	ja	Qualification Level: (Qualifikationsstufe)	Lead Auditor
External: (Externer)		Add. reviewer: (Zusätzlicher Prüfer)	

EAC Scopes: (EAC Branchen)
CDM 01 - Energy industries (renewable - / non-renewable sources)
CDM 03 - Energy demand

Add. qualification:
(zus. Qualifikation)

First Appointment: (Erstberufung)	05/15/2012	Valid to: (Gültig bis)	05/14/2015

Remarks: TA 1.2
TA 3.1

Languages: Tamil
English

Experience Exchange

Date	Location	Remarks	Accreditation(s)

Monitoring

Latest Monitoring:
(letzte Beurteilung)

Next Monitoring:
(nächste Beurteilung)

Remarks:

History of scope allocation

Date: 2012-06-18
Change: EAC CDM, CDM added
By: Praveen Urs
Reason:

History

Created:	06/18/2012 10:47:56 AM ZE5B	Kaustubh Rane/Ind/TUV
Modified:	06/18/2012 06:02:36 PM ZE8	Praveen Urs/Chn/TUV
	06/18/2012 06:02:33 PM ZE8	Praveen Urs/Chn/TUV
	06/18/2012 10:48:25 AM ZE5B	Kaustubh Rane/Ind/TUV

Qualification

C, Indumathi /

Emission Trading
United Nations Framework Convention on Climate Change

(The following data is set by the certification body)

Auditor No.:
(AuditorenRegNr)

Appointed: (Zugelassen)	ja	Qualification Level: (Qualifikationsstufe)	Lead Auditor
External: (Externer)		Add. reviewer: (Zusätzlicher Prüfer)	yes
EAC Scopes: (EAC Branchen)	CDM 01 - Energy industries (renewable - / non-renewable sources)		
Add. qualification: (zus. Qualifikation)			
First Appointment: (Erstberufung)	06/06/2012	Valid to: (Gültig bis)	05/06/2015

Remarks:	TA 1.2
Languages:	Tamil
	English
	Hindi

Experience Exchange

Date	Location	Remarks	Accreditation(s)

Monitoring

Latest Monitoring:
(letzte Beurteilung)

Next Monitoring:
(nächste Beurteilung)

Remarks:

History of scope allocation

Date: 2012-08-02
Change: EAC CDM added
By: Praveen Urs
Reason:

History

Created:	07/30/2012 12:45:55 PM	Kaustubh Rane/Ind/TUV
Modified:	08/02/2012 05:58:28 PM ZE8	Praveen Urs/Chn/TUV
	07/30/2012 12:46:56 PM	Kaustubh Rane/Ind/TUV