



VERIFICATION REPORT

for

7.25 MW Wind Energy Project of Aruppukottai Sri Jayavilas Ltd., Tamilnadu, India

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Report/Project Title		Name of Verification Company	
7.25 MW Wind Energy project of Aruppukottai Sri Jayavilas Ltd., Tamilnadu, India		SGS United Kingdom Limited	
Name of GHG Program			
Voluntary Carbon Standard Version 2007			
Revision Number		Client:	
01		Aruppukottai Sri Jayavilas Ltd.	
Summary:			
<p>SGS United Kingdom Limited has performed the Voluntary Emission Reduction verification of the CDM project "7.25 MW Wind Energy project of Aruppukottai Sri Jayavilas Ltd., Tamilnadu, India" UNFCCC Ref. Number 1137. The verification includes confirming the implementation of the monitoring plans of the registered PDD UNFCCC reg. no 1137 and the application of the monitoring methodology as per AMS I D, version 10 dated 23/12/2006. A site visit was conducted to verify the data submitted in the monitoring report version 01.</p> <p>The project activity is electricity generation from using the wind turbine generators and using the same for captive consumption after deducting 5% of gross as wheeling charges. The project activity consists of 17 wind turbine generators (WTGs) in Tirunelveli district of Tamil Nadu state in India. The project activity has 5 WTGs of 850 kW and 12 WTGs of 250 kW.</p> <p>SGS confirms that the project is implemented in accordance with the validated and registered Project Design Document. The monitoring system is in place and the emission reductions are calculated without material misstatements. Our opinion relates to the projects GHG emissions and the resulting GHG emission reductions reported and related to the valid and registered project baseline and monitoring and its associated documents. Based on the information seen and evaluated we confirm that the implementation of the project has resulted in 21,704 tCO₂e during period 01/04/2006 up to 20/10/2007.</p>			
Subject:			
VCS 2007 Verification		Indexing terms	
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Abbreviations

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEA	Central Electricity Authority
CEF	Carbon Emission Factor
CER	Certified Emission Reductions
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
DNA	Designated National Authority
DOE	Designated Operational Entity
GHG	Green House Gas(es)
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Plan
MR	Monitoring Report
NIR	New Information Requests
ODA	Official Development Assistance
PDD	Project Design Document
TNEB	Tamil Nadu Electricity Board
VCS	Voluntary Carbon Standard
VCUs	Voluntary Carbon Units

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1. Introduction

1.1 Objective

The client has commissioned an independent verification by SGS United Kingdom Ltd. of its reported greenhouse gas emission reductions from the 7.25 MW wind power project generating electricity to be used for captive consumption. The verifiers have reviewed the GHG data collected to date for the period between 01/04/2006 and 20/10/2007

The purposes of this verification exercise are, by review of objective evidence, to independently review:

- Whether the project has resulted in emission reductions as declared by the organisation or GHG project's GHG assertion
- The data reported are accurate, complete, consistent, transparent and free of material error or omission.

1.2 Scope and Criteria

This engagement covers verification of emission reductions from anthropogenic sources of greenhouse gases included within the project boundary of the "7.25 MW Wind Energy project of Aruppukottai Sri Jayavilas Ltd., Tamilnadu, India".

Our approach is risk-based, drawing on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these. Our examination includes assessment, on a test basis, of evidence relevant to the amounts and disclosures in relation to the project's GHG emission reductions for the defined reporting period.

1.3 VCS project Description

The project activity is an electricity generation project through wind turbines and supplying the same to the southern regional grid which after deducting wheeling charges of 5% is used for captive consumption. The project will result in replacing the same amount of electricity from southern regional grid which is dominated by fossil fuel based power plants.

The project activity consists of 17 wind turbine generators (WTGs) in Tirunelveli district of Tamil Nadu state in India. The project activity has 5 WTGs of 850 kW and 12 WTGs of 250 kW.

1.4 Level of assurance

The parameters and values presented in the monitoring report were assessed through review of detailed project documentation and generation records, interviews with personnel at the site, check of log book, JMR sheets and electricity bill copies of the company where the electricity is used for captive consumption, observation of established monitoring and reporting practices and assessment of the reliability of measuring equipment.

Information which was not available during site visit was reported as New Information Request (NIR), following submission of additional information, monitoring and operational records, and the reconsolidation of all reported data was assessed again.

1.5 Project Activity and Period Covered

This engagement covers emissions and emission reductions from anthropogenic sources of greenhouse gases included within the project boundary of the following project and period.

Title of Project Activity: 7.25 MW Wind Energy project of Aruppukottai Sri Jayavilas Ltd., Tamilnadu, India



UNFCCC Registration No:	1137
Monitoring Period Covered in this Report	01/04/2006 and 20/10/2007
Project Participants	Aruppukottai Sri Jayavilas Ltd.
Location of the Project Activity:	Tirunelveli district in Tamilnadu state of India The coordinates are 08° 08' to 09° 23' N and 77° 09' to 77° 54' E.

2. Methodology

2.1 General Approach

SGS's approach to the verification is a two-stage process.

In the first stage, SGS completed a strategic review and risk assessment of the projects activities and processes in order to gain a full understanding of:

- Activities associated with all the sources contributing to the project emissions and emission reductions, including leakage if relevant;
- Protocols used to estimate or measure GHG emissions from these sources;
- Collection and handling of data;
- Controls on the collection and handling of data;
- Means of verifying reported data; and
- Compilation of the monitoring report.

At the end of this stage, SGS produced a Periodic Verification Checklist which, based on the risk assessment of the parameters and data collection and handling processes for each of those parameters, describes the verification approach and the sampling plan.

Using the Periodic Verification checklist, SGS verified the implementation of the monitoring plan and the data presented in the Monitoring Report for the period in question. This involved a site visit and a desk review of the monitoring report. This verification report describes the findings of this assessment.

2.2 Verification Team for this Assessment

<i>Name</i>	<i>Role</i>	<i>SGS Office</i>
Vikrant Badve	Lead Assessor	SGS India
Jimmy Sah	Assessor (Trainee)	SGS India
Manish Dabkara	Local Assessor (Trainee)	SGS India

2.3 Means of Verification

2.3.1 Review of Project Documentation

The validated PDD, the monitoring report submitted by the client and additional background documents related to the project performance were reviewed. A complete list of all documents reviewed is attached in section 5 of this report.

2.3.2 Onsite Inspections

As part of the verification, the following on-site inspections have been performed

Location: Tirunelveli district in Tamilnadu state of India	
Date: 7-9 th January 2008	
Coverage	Source of information / Persons interviewed
Monitoring procedures for project activity.	Mr. Nagrajan
Emission reductions and calculations	Mr. Navin Mathur, Consultant, Bungee India

2.3.3 Review of Monitoring Results and Verification of the Correct Application of Monitoring Methodology

The total quantity of electricity generated i.e. Gross Electricity Generated (MWh) by WTG's was cross checked against the JMR sheet and the electricity bill copies of the company the calibration certificates of energy meter were also checked for validity.

Imported Power Consumption (MWh) was cross checked against the JMR sheet and electricity bill copies of the company.

Net Electricity generation by the project activity (MWh) is net power supplied to WTG's to the souther grid which after deduction of 5% as wheeling charges is available to the plant for captive consumption. The same was cross-checked by the monthly electricity bill copies for the plant. The calculations in the excel sheet were also checked.

2.3.4 Determinations of the Reductions in GHG Emissions

Parameter	Reported Value	Verified Value
Gross Electricity Generation (MWh)	24574.45	24663.258
Electricity imported (MWh)	91.63	92.238
Net energy displaced by the project (MWh)	23254.09	23337.857
Baseline Emission factor (tCO ₂ /MWh)	0.93	0.93
Baseline emissions (tonne of CO ₂)	21626.0	21704.0
Project emissions (tonne of CO ₂)	0	0
Emission reductions (tonne of CO ₂)	21626.0	21704.0

2.3.5 Review of Additional Data from other Sources if appropriate

CO₂ emission factor (Baseline) tCO₂/kWh was calculated by the project proponent as per ACM0002 and this was checked against the methodology ACM0002 and found correct. The emission factor is calculated "ex-ante" and is provided in the registered PDD. The baseline emission factor as mentioned in registered PDD is 0.93 tCO₂e/MWh.

2.4 Reporting of Findings

As an outcome of the verification process, the team can raise different types of findings

In general, where insufficient or inaccurate information is available and clarification or new information is required the team shall raise a New Information Request (NIR) specifying what additional information is required.

Where a non-conformance arises the team shall raise a Corrective Action Request (CAR). A CAR is issued, where:

- I. the verification is not able to obtain sufficient evidence for the reported emission reductions or part of the reported emission reductions. In this case these emission reductions shall not be verified and certified;
- II. the verification has identified misstatements in the reported emission reductions. Emission reductions with misstatements shall be discounted based on the verifiers ex-post determination of the achieved emission reductions

The verification process may be halted until this information has been made available to the assessors' satisfaction. Failure to address a NIR may result in a CAR. Information or clarifications provided as a result of an NIR may also lead to a CAR.

Observations may be raised which are for the benefit of future projects and future verification actors. These have no impact upon the completion of the verification activity.

Corrective Action Requests and New Information Requests are detailed in Periodic Verification Checklist. The Project Developer is given the opportunity to "close" outstanding CARs and respond to NIRs and Observations.

2.5 Internal Quality Control

Following the completion of the assessment process and a recommendation by the Assessment Team, all documentation will be forwarded to a Technical Reviewer. The task of the Technical Reviewer is to check that all procedures have been followed and all conclusions are justified. The Technical Reviewer will either accept or reject the recommendation made by the assessment team.

3. Verification Findings

3.1 *Remaining Issues, including any material discrepancy, FAR's from Previous Validation*

There are no issues pending from the previous validation report.

3.2 *Project Implementation*

The physical components, project boundaries are in conformity with description in the registered PDD and monitoring report. No additional emission sources used for project activity.

The first machine in the project was commissioned on 18th March 2006; this was checked with the registered PDD. Thus the project proponent had claimed the emission reductions from 18th March 2006 to 20th October 2008. CAR 01 was raised as according to the VCS guidelines 2007, the crediting period cannot be earlier than 28th March 2006. In response the project proponent revised the monitoring report which mentions the crediting period from 1st April 2006 to 20th October 2007. The same was cross-checked with the revised monitoring report and is acceptable. Thus CAR 01 was closed.

3.3 *Completeness of Monitoring*

The monitoring of the project activity is found to be in conformity with monitoring methodology described in AMS I D version 10 and monitoring plan indicated in the registered PDD of project activity.

The required monitoring systems have been installed and operational. The values mentioned in the Joint Meter Reading sheets are fed into an excel file which is used for calculation of emission reductions, thus while cross-checking the values of the emission reduction calculation sheet provided; data mismatch was observed for the HTSC 1718 & 1800 for the month of February 2007 while for HTSC 1799 the mismatch was for the month of March 2007. Clarification was sought from the project proponent for the month of May 2006 as why there was no generation. CAR 03 was raised for the same. In response the project proponent rectified the values and revised the emission reduction calculation sheet and clarified that the wind mills were shut down in the month of May due to temporary tie up permission from TNEB, thus there is no generation during that period. The revised emission reduction sheet was checked for the amount of electricity provided to the grid and subsequent emission reductions from project activity and was found to be matching with the JMR sheets. The JMR sheets for entire monitoring period was checked during the site visit and the values of electricity export and import mentioned in same matches with the same provided in revised excel sheet and thus CAR 03 was closed.

The JMR sheets mention the value of Gross electricity, Imported electricity and Net electricity supplied but the same needs to be cross-checked with the monthly electricity bill copies of the company where it is being used for captive consumption. Thus NIR 2 was raised. The project proponent provided the monthly electricity bill copies which mention the value of Gross electricity, Imported electricity and Net electricity supplied by the project activity. The same was cross-checked with JMR sheets and is acceptable thus NIR 2 was closed out.

3.4 *Accuracy of Emission Reduction Calculations*

The meters comply with appropriate quality standards applicable for the used technology; however the monitoring report mentions the meters installed for recording the generation are of 0.2 accuracy class but the calibration certificate provided mentions the meters are of 0.5 accuracy class clarification was sought for the same and CAR 04 was raised. In response the project proponent clarified that the value was mentioned erroneously and corrected the same in the revised monitoring report. The same was checked in the revised monitoring report and is acceptable. Thus CAR 04 was closed.

The calibration certificates for the project have been provided, the same was checked and is acceptable.

The monitoring report version 1 had only 3 monitoring parameters while the Registered PDD had a fourth monitoring parameter as "electricity recorded at each wind turbine meter"; clarification was sought from the project participant as why this parameter has not been monitored for the crediting period. CAR 05 was raised for the same. The project proponent clarified that the project activity was registered with the UNFCCC on 23rd October

2007 with the reference number 1137 and the fourth monitoring parameter of “electricity recorded at each wind turbine meter” was added based on the correction requested by the UNFCCC and thus the same was not monitored earlier i.e prior registration. The same is now monitored after registration as per the correction requested by the UNFCCC. During the site visit it was checked by the Assessor that Project proponent is monitoring the this parameter in internal logbooks which was found acceptable. Thus CAR 05 was closed.

3.5 *Quality of Evidence to Determine Emission Reductions*

Critical parameters used for the determination of the Emission Reductions are discussed above in section 2.3.3 above. All the data recorded are in compliance with the monitoring report.

3.6 *Management and Operational System*

The monitoring data is recorded joint in the presence of a person from the TNEB and personnel from the project proponent. The electricity at each wind mill is also monitored in the log books for the period after the correction was requested by the UNFCCC. The monitored data is cross-checked in the month end. The same data is also cross-checked from the data of electricity bill copies of the plant.

In order to avoid any kind of discrepancy in the monitoring process, regular internal audits are planned. The audit team comprise of the in house technical experts and the senior officials which is then reviewed by the In charge for wind mill generations.

4. Verification Conclusion

SGS United Kingdom Ltd. has been engaged by Aruppukottai Sri Jayavilas Ltd. to examine the greenhouse gas (GHG) emission reductions reported from the Bagasse “7.25 MW Wind Energy project of Aruppukottai Sri Jayavilas Ltd., Tamilnadu, India” for the period, equating to 21704 tonnes of CO₂ equivalents. Our opinion relates to the project’s GHG emissions and resulting GHG emissions reductions reported for the period 01/04/2006 to 20/10/2007 and the verification testing conducted against the GHG Assertion of the Wind Mills generation from the project and the PDD of 7.25 MW Wind Energy project of Aruppukottai Sri Jayavilas Ltd., Tamilnadu, India.

The management of the Aruppukottai Sri Jayavilas 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 Monitoring and Verification Plan. The development and maintenance of records and reporting procedures in accordance with that plan, including the calculation and determination of GHG emission reductions from the project is the responsibility of the management of the Aruppukottai Sri Jayavilas Ltd.

It is our responsibility to express an independent GHG verification opinion on the GHG emissions from the project for the period 01/04/2006 to 20/10/2007 and on the calculation of GHG emission reductions from the project based on the verified emissions for the same.

The verification approach was based on the requirements as defined in Voluntary Carbon Standard VCS 2007. Our approach is risk-based, drawing on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these. Our examination includes assessment, on a test basis, of evidence relevant to the amounts and disclosures in relation to the project’s GHG emission reductions for the period 01/04/2006 to 20/10/2007. We 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 the amount of GHG emission reductions for the period 01/04/2006 to 20/10/2007, prepared on the basis of the Monitoring Report dated 25/02/2008, are fairly stated. We conducted our verification with regard to the client’s GHG projects PDD and monitoring report which included project plan, baseline applied and baseline GHG emissions or removals, Monitoring and Verification Plan, GHG Emission reduction, removal enhancements. This assessment included collection of evidence supporting the reported data checking whether the provisions of the Monitoring and Verification Plan in the PDD were consistently and appropriately applied

We have verified whether the information included in the monitoring report representing the project baseline is current and has been extracted from the project site and the emission reduction achieved has been determined by correctly subtracting emissions for the monitoring period 01/04/2006 to 20/10/2007 from the baseline figures for the comparable

Reporting period: 01/04/2006 to 20/10/2007

Verified emission in the above reporting period:



Project emissions	0	tCO ₂ equivalents
Baseline emissions	21704	tCO ₂ equivalents
Emission reductions	21704	tCO ₂ equivalents

Based on process and procedures conducted, in our opinion, Aruppukottai Sri Jayavilas Ltd assertion on GHG emission reductions for the “7.25 MW Wind Energy project of Aruppukottai Sri Jayavilas Ltd., Tamilnadu, India” project during the reporting period 01/04/2006 to 20/10/2007 is materially correct and is a fair representation of the GHG data and information and the emission reductions are fairly stated. The GHG emission reductions were calculated correctly on the basis of approved monitoring methodology AMS I D version 10.

SGS confirms that the project is implemented as described in the validated and registered project design documents. Based on the information we have seen and evaluated, we confirm the following:

Name and Reference	"7.25 MW Wind Energy project of Aruppukottai Sri Jayavilas Ltd., Tamilnadu, India"
Number of Project	UN NO. 1137
Registered PDD and Approved Methodology used for Verification	Registered PDD version 07 dated 18/09/2007 Methodology AMS I D version 10 dated 23 rd December 2006
Applicable Period	01/04/2006 to 20/10/2007
Total GHG Emission Reductions Verified	21704 t CO ₂

Signed on behalf of the Verification Body by Authorized Signatory

[SGS United Kingdom Limited]	[SGS India Pvt. Ltd]
	
13/03/08	12/03/2008
Siddharth Yadav	Vikrant Badve



5. Document References

- 1 Registered PDD version 7 dated 18/09/2007
- 2 Monitoring Report Version 1 dated 20/11/2007
- 3 Monitoring Report Version 2 dated 28/01/2008
- 4 Monitoring Report Version 3 dated 04/02/2008
- 5 Monitoring Report Version 4 dated 25/02/2008
- 6 AMS I D version 10 dated 23rd December 2006
- 7 Joint meter readings for the project activity
- 8 Electricity bill copies of the company
- 9 Calibration certificate for the project activity
- 10 Document "VCS 2007"

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