VCS VERIFICATION / CERTIFICATION REPORT

VOLUNTARY CARBON STANDARD 2007.1

BIOMASS BASED STEAM GENERATION PROJECT BY STERLING AGRO INDUSTRIES LTD IN INDIA

VERIFICATION PERIOD:
25 APRIL 2009 TO 5 FEBRUARY 2010

REPORT Nº.2010-0500
REVISION NO. 01

DET NORSKE VERITAS

VCS VERIFICATION / CERTIFICATION REPORT

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Client: Sterling Agro Industries Ltd.		Client ref.: Mr. Sharad Saluja

DET NORSKE VERITAS

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Summary:

Det Norske Veritas Certification AS (DNV) has performed the verification of the emission reductions reported for the CDM project activity "Biomass based steam generation project by Sterling Agro Industries Ltd" in India for the period from 25 April 2009 to 5 February 2010. The project activity was validated by SGS United Kingdom Ltd (validation report: CDM.Val2221, issued on 4 January 2010) and it was registered on 6 February 2010 under the UNFCCC reference number 2952. As emission reductions occur prior to the registration of the project as CDM project activity, these emission reductions can not be claimed as Certified Emission Reductions (CERs). The emission reductions are thus claimed as Voluntary Carbon Units (VCU) under the Voluntary Carbon Standard (VCS) 2007.1 This is in accordance to the eminent VCS Guidance for projects that are registered in two GHG programs.

In DNV's opinion, the emission reductions reported for the "Biomass based steam generation project by Sterling Agro Industries Ltd" in the VCU monitoring report of 20 July 2010 are fairly stated. DNV is able to certify that the emission reductions from the "Biomass based steam generation project by Sterling Agro Industries Ltd" during the period from 25 April 2009 to 5 February 2010 amount to 19 007 tonnes of CO_2 equivalent.

DNV does not assume any responsibility towards the issuance and utilization of VCUs hereby verified and certified. Request for issuance of VCUs shall be made by the project proponent to an approved VCS Program Registry based on the requirements set out under the most recent version of the VCS Program Guidelines clause on VCS Registration. The verification of reported emission reductions is based on the information made available to DNV and the engagement conditions detailed in this report. Hence, DNV cannot be held liable by any party for decisions made or not made based on this report.

Report No.: 2010-0500	Subject Group: Environment
Report title: Biomass based steam generation project by Sterling Agro Industries Ltd in India	
Work carried out by: Nitin Kapoor, Astakala Vidyacharan, Prabhu Ravikumar	
Work verified by: Andrea Leiroz	
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Table of Content *Page*

Abbreviations

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction(s)
CL	Clarification Request
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
COD	Chemical Oxigen Demand
DNV	Det Norske Veritas
DOE	Designated Operational Entity
EB	Executive Board
FAR	Forward Action Request
GCV	Gross Calorific Value
GHG	Greenhouse gas(es)
GPS	Global Positioning System
GWP	Global Warming Potential
IETA	International Emissions Trading Association
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Plan
NCV	Net Calorific Value
PD	Project Description
PDD	Project Design Document
UNFCCC	United Nations Framework Convention for Climate Change
UPPCB	Uttar Pradesh Pollution Control Board
VCS	Voluntary Carbon Standard
VCU	Voluntary Carbon Unit
VER	Verified Emission Reductions

1 INTRODUCTION

Sterling Agro Industries Ltd has commissioned Det Norske Veritas Certification AS (DNV) to carry out the verification of emissions reductions reported for the CDM project activity "Biomass based steam generation project by Sterling Agro Industries Ltd"[1] (UNFCCC Reference Number: 2952) for the verification period from 25 April 2009 to 5 February 2010, under the VCS program as per VCS 2007 standard. This verification aims to assess and verify the emission reduction occurred before the registration of the "Biomass based steam generation project by Sterling Agro Industries Ltd" as a CDM project activity. Thus, this verification report contains (i) the findings from the verification according to Voluntary Carbon Standard 2007 and (ii) a VCU certification statement for the emission reductions. It is relevant to note that in 2007, DNV was also commissioned to conduct a previous verification of Voluntary Carbon Units (VCU) under the Voluntary Carbon Standard (VCS version 01) for the "Biomass based steam generation project by Sterling Agro Industries Ltd" which was under operation but not yet registered as a CDM project activity during this verification period (from 25 April 2009 to 5 February 2010). As per the contract signed with Sterling Agro Industries Limited, DNV has initiated the first verification of Voluntary Carbon Units (VCU) for the period from 25 April 2009 to 5 February 2010.

1.1 Objective

Verification of "pre-registration" emission reductions from a project activity is an independent review and *ex-post* determination by a Verification Entity or Designated Operational Entity (DOE) (which is the approved verifier under CDM GHG program) of the monitored reductions in GHG emissions that have occurred as a result of the implementation of a CDM project activity during the period from the date when the project started to operate until the date when the project was actually registered as a CDM project activity by the CDM Executive Board (EB).

Certification is the written assurance by a Certification Entity that, during a specific period in time, a project activity achieved the emission reductions as verified.

The validation of a project against the criteria of VCS 2007.1 may be carried out by an entity accredited under a GHG Program recognized by the VCS Program, such as the CDM. DNV is a Designated Operational Entities (DOEs) approved under the CDM for all sectoral scopes and DNV can thus perform VCS validation and VCS verification for the sectoral scope relevant for this project activity.

The objective of this verification was to verify and certify the voluntary emissions reductions reported for the "Biomass based steam generation project by Sterling Agro Industries Ltd" for the period 25 April 2009 to 5 February 2010.

[1] "Biomass based steam generation project by Sterling Agro Industries Ltd" was registered, as a CDM project activity, on 20 October 2008. Additional information regarding the referred project is available at the UNFCCC website: http://cdm.unfccc.int/Projects/DB/SGS-UKL1210924584.49/view.

1.2 Scope and Criteria

1.2.1 Scope of the verification

The scope of the verification is:

- Verify whether the reductions generated by the project are in line with the Voluntary Carbon Standard Verification Protocol **Error! Reference source not found.** and the information provided by the project participants contains all the necessary information to evidence the project's compliance with all criteria in the Voluntary Carbon Standard.
- Verify that the project was implemented as described in the Project Design Document (PDD) during the verification period.
- Confirm that the monitoring system was implemented and fully functional to generate voluntary emission reductions (VCU[2]) without any double counting during the whole verification period.
- By checking the monitoring records and the emissions reduction calculation, express a conclusion whether reported data are accurate, complete, consistent, and transparent, with a high level of assurance and free of material error or misstatement.
- Validation of VCS requirements not covered by the CDM validation.

According to the VCS requirements, the verification also includes an independent third party assessment of the project design. In particular, the project baseline, monitoring plan and the project compliance with relevant applicable protocols and criteria (i.e. UNFCCC, VCS, host Party and others) are to be validated in order to confirm that the project design, as documented, is sound and reasonable and meets the applicable criteria.

The project design, its eligibility as CDM project activity and the correct application of the CDM approved baseline and monitoring methodology AMS-I.C (version 13) /15/ were all already validated by DOE SGS United Kingdom Ltd. and the project was on 6 February 2010 registered as CDM project activity with the reference number 2952. The validation opinion by SGS United Kingdom Ltd. is that the "Biomass based steam generation project by Sterling Agro Industries Ltd" as described in the PDD of 31 August 2009 (version 1.3) meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the approved baseline and monitoring methodologies AMS-I.C. (version 13) /15/. Based on the validation opinion of DOE SGS United Kingdom Ltd. and also based on the registration of the project as a CDM project activity by CDM EB/UNFCCC, DNV assumes that the project design as documented is sound, reasonable and meets the relevant UNFCCC and host Party criteria.

As the VCS recognizes the CDM as a GHG Program that meets its VCU Verification Criteria, this verification report thus only addresses VCS specific and unique criteria in terms of

[2] As per VCS, Verified Emission Reductions (VERs) are considered to be VCUs only after successful registration in an approved VCU Registry.

project design, applicability to the adopted methodology and additionality that have not been so far addressed in the Validation Report /5/ as per CDM requirements.

1.2.2 Validation Criteria for VCS requirements not covered by the CDM validation

As the project has been validated under the CDM, a further validation shall be completed of clauses 1.12, 1.13, 1.14, 8.1 and 8.2 of the VCS Project Description template (http://v-c-s.org/docs/VCS%20PD.doc) /22/ as required by the current VCS 2007.1 "Policy Announcement from the VCS Association - Further Guidance for Projects that are registered in two GHG Programs" /17/. This validation was completed as part of the current VCU verification (refer to Appendix B) and the additional clauses have been addressed in the VCS PD, version 1 dated 2 June 2010 /2/.

1.2.3 Verification Criteria

The verification team has focused on the identification of significant reporting risks and verifying the mitigation measures for these based on the recommendations in the CDM Validation and Verification Manual /14/**Error! Reference source not found.**, ISEA3000 (Revised) Assurance Engagements other than Audits or Reviews of Historical Financial Information /16/ and/or ISO/FDIS 14064-3 "Greenhouse gases – Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions /17/.

According to the requirements and guidance of VCS 2007.1 /18-21/, the criteria of this verification include the relevant applicable rules and steps for CER verification under the CDM excluding:

• the public availability of the VER/VCS Monitoring Report;

• the public availability the Verification Report and VCU Certification Statement.

1.3 VCS Project Description:

1.3.1 Project Category

According to the VCS 2007.1 Guidelines and the list of Sectoral Scopes of the UNFCCC, the project is applicable under the following activity categories:

- category 1 – Renewable energy (wind, PV, solar, thermal, biomass, liquid biofuels, geothermal, run-of-river hydro).

According to Annex A of the Kyoto Protocol, the project is applicable under the sectoral scope 1

- Energy Industries (renewable/ non-renewable sources).

1.3.2 Geographic Location

The project is located at dairy products manufacturing unit at Bhitouna, Kasganj-Soron Road, Dist-Kanshiram Nagar, Uttar Pradesh. The exact location of the project is defined using GPS coordinates: Latitude 27º48'00''E and longitude 78º42'00''N.

1.3.3 Project Background

The Biomass based steam energy project developed by Sterling Agro Industries Ltd as proponent and operator of the project comprises installation of a biomass based boiler with an installed capacity of 15TPH for generation of thermal energy which will displace the coal based steam which would have been used in the absence of the project. The project uses renewable biomass which is rice husk for generation of steam during the current monitoring period.

The plant was commissioned and handed over to the project proponent on 24 April 2009 as confirmed from the letter of the equipment supplier /8/.

The CDM baseline and monitoring methodologies used is AMS-I.C – "Thermal energy for the user with or without electricity" (version 13) /15/.

1.4 Level of assurance

As the VCS 2007.1 only recognizes verified emission reductions, DNV has focused on providing a reasonable level of assurance that the emission reduction calculation methodology used is appropriate and correctly applied, and that emission reductions have been accurately monitored.

DNV may discount verified emission reductions or requests a discount of these by using conservative assumptions for uncertainties in emission reduction calculations that cannot be fully quantified or that cannot give a desired level of assurance. For verifying/certifying VCUs, the desired level of assurance was based on the combined quantitative assessment of the accuracy of monitoring project performance and the identification of material risks.

2 VERIFICATION METHODOLOGY

The verification of the emission reductions has assessed all factors and issues that constitute the basis for the emission reductions from the project according to applicable small-scale CDM methodology AMS-I.C, version 13 /15/, including the quantity of steam generated by the project activity, the biomass consumption, coal consumption, the pressure and temperature of steam as well as the temperature of the feed water return.

Verification team

				Type of involvement						
Role	***Last Name***	***First Name***	***Country***	Administrative	Desk review	Site visit	Reporting	Supervision of work	Technical review	Sectoral competence
Project manager	Kapoor	Nitin	India	✓						
Technical team leader (CDM verifier)	Vidyacharan	Astakala	India		✓		✓	✓		
GHG auditor	Kapoor	Nitin	India		✓	✓	✓			
Sectoral Competence	Prabhu	Ravikumar	India		✓					✓
Technical reviewer	Leiroz	Andrea	Brazil						✓	
Person with sectoral competence assisting technical reviewer	Ranganathan	Seshan	India							✓

Duration of verification

Preparations:	18 June 2010 to 23 June 2010
On-site verification:	24 June 2010 to 25 June 2010
Additional round of interviews and checking of documentation with the project participants:	25 June 2010 to 15 July 2010
Reporting and QA/QC:	21 July 2010 to 21 December 2010

2.1 Review of Documentation

The following documents were assessed as a part of the verification audit:

- The VER/VCU Monitoring Report, version 1 of 2 June 2010 for the period from 25 April 2009 to 5 February 2010 /1/; VCS-PD, version 1 dated 2 June 2010;
- The VER/VCU Monitoring Report, version 2 of 20 July 2010 **Error! Reference source not found.** for the period from 25 April 2009 to 5 February 2010/1/;
- VCU calculation spread sheets /4/;
- Calibration certificates for all the monitoring devices /6/;
- Consents by the State Pollution Control Boards and boiler certificates issued by the state boiler department;
- Boiler handover report dated 30 April 2009 by M/s Cheema Boilers confirming the commissioning of the boiler on 24 April 2009 /8/;
- Plant record as well as fuel purchase ledgers for recording the shift wise data and biomass purchase data respectively /10/ /12/;
- Biomass assessment report prepared by Enviroaid for the period 2009-2010 /11/;
- Letter for undertaking dated 22 July 2010 by the project participant confirming that the project has not created any other form of environmental credits /13/.

In addition, the project's Project Design Document (PDD) /3/ , in particular the Monitoring Plan included in the PDD, and the Validation Report CDM. Val2221 of SGS United Kingdom Ltd /5/ was also assessed.

2.2 Site Visit

DNV conducted a site visit to the dairy project manufacturing unit at Bhitouna, Kasganj-Soron Road, Dist-Kanshiram Nagar, Uttar Pradesh on 24 and 25 June 2010.

During the visit DNV was able to verify the actual implementation of the project and confirms that the project has been implemented and operated as described in the VER/VCU Monitoring Report and as envisaged. DNV's assessment included in particular the verification of the internal measurement records, calculation spreadsheet evidences in the form of plant log books and procurement data.

The verification of reported data was carried out by means of:

- Checking plant records recording the boiler parameters on a shift wise;
- Rice procurement data to confirm the quantity of rice husk (biomass procured) /12/;
- Calibration of all the monitoring instruments /6/;
- Legal consents by the Uttar Pradesh Pollution Control Board /9/;
- Biomass assessment report reflecting surplus biomass availability in the region /11/;
- Verifying the effectiveness of the data quality assurance and control.

2.3 Assessment

The analysis of documentation, interviews and site visit allowed the assessment of the following processes and assumptions (including QA/QC related issues):

- Monitoring of the total steam generated is done on a daily basis using steam flow meters under the supervision of shift in-charge.
- Monitoring of various boiler parameters like steam pressure, steam temperature, enthalpy of steam, feed water temperature and enthalpy is done shift wise.
- Quantity of fuel used onsite is monitored using weighing scales and recorded in log books. The same are cross –checked with fuel procurement data.
- The net calorific value of fuels is calculated using bomb calorimeters.
- The surplus biomass availability has been done through site assessment carried out by an external agency (Enviroaid). The surplus biomass availability has been assessed as 110% which has been verified by DNV as mentioned and calculated in the monitoring report version 2 /1/

The verification of reported data and information was carried out by means of:

- Checking individual shift wise reading of the various boiler parameters like pressure, temperature, steam flows as well as condensate return temperature;
- Confirmation of the correct compilation of emission reduction calculation spreadsheets (values included in the spreadsheet were individually checked against the records listed above);
- Verifying the effectiveness of the data quality assurance and control;
- Confirmation that the registered CDM project activity meets the additional VCS 2007.1 requirements.

2.4 Report of Findings

Findings established during the verification may be that:

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 material misstatements in the reported emission reductions.

While aiming to resolve any outstanding issues which needed be clarified about the project design, findings established during the verification can either be seen as a non-fulfilment of the VCU Verification Criteria or where a risk to the fulfilment of project objectives is identified. Emission reductions with material misstatements shall be discounted based on the verifiers' *ex-post* determination of the achieved emission reductions.

Corrective action requests (CAR) are issued, where:

i) mistakes have been made with a direct influence on project results requiring adjustments of the VERs/VCUs monitoring report;

ii) applicable methodological specific requirements have not been met.

A request for clarification (CL) may be used where additional information is needed to fully clarify an issue.

A forward action request (FAR) should be issued, where:

i) the actual project monitoring and reporting practices requires attention and /or adjustment for the next consecutive verification period, or
ii) an adjustment of the MP is recommended.

In the context of FARs, risks have been identified, which may endanger the delivery of high quality emissions reductions in the future, i.e. by deviations from standard procedures as defined by the MP. As a consequence, such aspects should receive a special focus during the next consecutive verification. A FAR may originate from lack of data sustaining claimed emission reductions.

DNV was able to verify that the GHG emission reductions reported for the "Biomass based steam generation project by Sterling Agro Industries Ltd" in the VCU monitoring report of 20 July 2010 are fairly stated.

During this verification, three CARs have been raised. These CARs have been satisfactorily addressed by the project proponent and hence been closed. The CARs raised and the responses provided by the project proponent have been detailed in Appendix A.

No clarification request (CL) and forward action request (FAR) was identified.

3 VERIFICATION FINDINGS

This section summarises the findings from the verification of the voluntary emission reductions reported for the "Biomass based steam generation project by Sterling Agro Industries Ltd" for the period from 25 April 2009 to 5 February 2010. The findings of this verification are documented in Appendix A.

3.1 Remaining Issues from Previous Validation or Verification

This is the first verification of the Voluntary Carbon Units (VCU), under the Voluntary Carbon Standard (VCS 2007.1), for Biomass based steam generation project by Sterling Agro Industries Ltd. There were no FARs stated in the validation report /5/ which were required to be closed during verification.

3.2 Project Implementation

As informed by the project participant and verified by DNV during the site visit, the installed capacity of the biomass boiler is the same as the capacity stated in the validated PDD /3/. The boiler capacity is verified to be 15 tonnes per hour, 21 kg/cm^2 supplied by Cheema Boiler. During the monitoring period, 100% biomass was used for generation of steam. The dairy plant underwent maintenance during this monitoring period for 15 days (i.e. from 1 June 2009 to 15 June 2009). It has been confirmed that no credits during this period have been claimed by the project participant.

3.2.1 Eligible GHGs

The project activity contributes to reductions in the emissions of carbon dioxide (CO_2) by generating thermal energy using a renewable source, thus, displacing thermal energy generation based on fossil fuels in the dairy plant.

3.2.2 Project Start Date and Emission Reduction Start Date

The starting date of the project activity is 24 April 2009 which is the date when the plant was successfully and handed over to project participant. Consequently emission reductions have been claimed from 25 April 2009 which is considered appropriate.

3.2.3 Public Funding and Grants

The validation of the CDM project did not reveal any information that indicated that the project received any public funding.

3.2.4 Project Boundary/GHG Assessment Boundary

The project boundary is clearly defined as the steam generation boiler and the fuel storage area. The same has also been mentioned in the validation report by SGS /5/.

3.2.5 Baseline Determination

As the project design was previously assessed by the Designated Operational Entity (DOE) SGS United Kingdom Ltd. as part of the CDM validation phase (in particular in terms of the project's baseline, the monitoring plan, and the project's compliance with relevant UNFCCC and host Party criteria) and as the project was registered by the CDM EB as a eligible CDM project activity, it is thus confirmed that:

i) The project correctly applies the approved baseline and monitoring methodology AMS-I.C (version 13) titled "Thermal energy for the user with or without electricity" /15/.

ii) The baseline and monitoring methodologies have been correctly applied and the assumptions made for the selected baseline scenario are sound.

3.2.6 Project Additionality

As the project design was previously assessed the Designated Operational Entity (DOE) SGS United Kingdom Ltd. as part of the CDM validation phase in particular in terms of the project's baseline, the monitoring plan, and the project's compliance with relevant UNFCCC and host Party criteria and the project was registered by the CDM EB as a eligible CDM project activity, it is thus confirmed that project is not a likely baseline scenario, and that emission reductions resulting from the project are additional.

According to the validation report, the investment analysis and barrier analysis demonstrates that the most plausible scenario is the use of coal for generation of steam and that the emission reductions by the project are additional to any emission reductions occurring in absence of the project.

Detailed information regarding project additionality is available at:

i) PDD version1.3 of 31 August 2009 /3/.

ii) SGS United Kingdom Ltd, CDM Validation report dated 4 January 2010 /5/.

3.2.7 GHG Emission

As the project design has been previously assessed by the Designated Operational Entity (DOE) SGS United Kingdom Ltd as part of the CDM validation phase (in particular in terms of the project's baseline, the monitoring plan, and the project's compliance with relevant UNFCCC and host Party criteria) and as the project has been registered by the CDM EB as a eligible CDM project activity, it is confirmed that the approach for determining project and baseline emissions are appropriate and in accordance with the selected baseline and monitoring methodologies.

The calculation of the baseline emission factor was performed as required by the methodology. The CO_2 emission factor for coal has been taken as per the IPCC default values and the efficiency of the coal fired boiler that would have been used in the baseline scenario has been taken as 100%. The same have been fixed *ex-ante* and have been validated by SGS.

The reported GHG emission reductions from the project are 19 007 tonnes CO_2 equivalent (tCO_2) during the period from 25 April 2009 to 5 February 2010.

3.2.8 Secondary Effects

Regarding secondary effects (leakage), no leakage sources were identified given that no equipment is transferred from any other activity. The same was confirmed during site visit. Also, since there is surplus availability of biomass in the area, the emissions due to competing use of biomass have also been taken as zero. Availability of surplus biomass has been verified from the biomass assessment report /11/ developed by Enviroaid (external experts).

Leakage emissions on account of transportation of biomass have been taken as zero. During validation, it was verified by SGS that coal, in the pre-project scenario was transported from coal mines which were located at a distance of 300-350 km from the project site, while the biomass is procured from within a radius of 100 km as there is a huge surplus within 100 km itself /11/.

3.2.9 Impacts on Sustainable Development

As the project design was previously assessed by the Designated Operational Entity (DOE) SGS United Kingdom Ltd as part of the CDM validation phase (in particular in terms environmental impacts and comments by local stakeholder, parties and NGOs in order to comply with relevant UNFCCC and host Party criteria) and as the project was registered by the CDM EB as a eligible CDM project activity, it is DNV's contention that the project's social and environmental impacts have been sufficiently addressed. In addition, the DNA of India has provided confirmation that the project assists in achieving sustainable development, through the Letter of Approval issued on 8 June 2009 /23//.

3.3 Compliance of monitoring plan with monitoring methodology

DNV is able to confirm that the monitoring plan contained in the registered PDD version 1.3 dated 31 August 2009 is in accordance with the approved methodology applied by the project activity /15/.

3.4 Compliance of monitoring with the monitoring plan

The monitoring has been carried out in accordance with the monitoring plan contained in the registered PDD version 1.3 of 31 August 2009 /3/

DNV is able to confirm that the monitoring plan and the applied methodology AMS-I.C (version 13) /15/ have been properly implemented and followed by the project participants.

As the project design was previously assessed by the Designated Operational Entity (DOE) SGS United Kingdom Ltd as part of the CDM validation phase (in particular in terms of the project's baseline, the monitoring plan, and the project's compliance with relevant UNFCCC and host Party criteria) and as the project was registered by the CDM EB as a eligible CDM project activity, it is DNV's contention that the application of the monitoring methodology is transparent.

For the verification period, all indicators stated in the applicable monitoring methodology AMS-I.C /15/ were correctly monitored and reported.

Monitoring parameters include quantity of steam generated (measured using calibrated steam flow meters). The total quantity of steam generated using biomass as a fuel was verified to be 83 808 tonnes of steam. The monitoring is shift wise and averaged daily. The steam flow meters have been calibrated annually /6/ and it was verified that the calibration is valid for the complete verification period.

Temperature and pressure of steam is monitored on shift basis and averaged daily. Daily average values have been applied for the calculation of enthalpy of the steam generated. The temperature and pressure monitoring instruments have been calibrated annually /6/ and it was verified that the calibration is valid for the complete verification period.

Enthalpy of steam generated is based on daily averaged values of steam pressure and temperature as explained above. This has been calculated by referring to the steam tables based on the recorded pressure and temperature of the steam.

The enthalpy of feed water has been monitored using the monitored value of the temperature of the feed water to the boiler. This has been monitored using calibrated temperature gauges. This has been recorded shift wise and averaged daily. The enthalpy calculated using the monitored temperature values was lower than the enthalpy calculated using the design temperature of feed water and hence for the purpose of calculation of emission reductions the design feed water temperature has been used.

The total quantity of biomass (rice husk) combusted on-site has been confirmed to be 25 670 tonnes during the current monitoring period. This has been recorded as and when rice husk is procured using calibrated weigh bridges. The weigh bridge is calibrated annually and it has been verified that calibration is valid for the complete monitoring period. The fuel purchase ledger has been used to cross verify the quantity of rice husk consumed during the current monitoring period /12/.

No fossil fuel has been combusted on-site during the current monitoring period as confirmed from site visit and boiler records /10/.

The net calorific value of biomass has been calculated using the gross calorific value (GCV) determined using calibrated bomb calorimeter. The bomb calorimeter has been calibrated annually and the calibration is valid for the complete verification period /12/. The GCV has

been converted to NCV using the equation recommended in IPCC 2006 and mentioned in the Excel file /4/. The determined GCV values and calculated NCV values are detailed in the Excel files /4/.

The surplus biomass availability in the region has been calculated to be 110% based on the biomass assessment report /11/ by Enviroaid (external experts). It has been confirmed from the report that the total biomass available is 278 234 MT in the command area (within a radius of 100 km). The total rice husk consumption is 99 567 MT while that of the project activity (adjusted for the complete year) is 32 760 MT, leaving an excess of 145 907 MT. This is 110% surplus after considering the project activity.

Thus all the parameters have been monitored as per the requirements of the methodology /15/ and are line with the monitoring plan mentioned in the registered PDD /3/.

The CO_2 emission factor for coal (96.1 tCO_2/TJ) & efficiency of the baseline coal fired boiler (100%) have been fixed *ex-ante*.

The emission reductions for the period from 25 April 2009 to 5 February 2010 were correctly calculated on the basis of the monitoring methodology AMS-I.C (version 13) /15/.

DNV verified the information flow (from data generation, aggregation, to recording, calculation and reporting) for these parameters including the values in the monitoring report /1/ and emission reductions calculation spreadsheet /4/.

3.5 Assessment of data and calculation of emission reductions

As per paragraph 203 of VVM version 01.2 /14/, the monitoring plan was confirmed to be in accordance with the approved small scale methodology applied by the proposed CDM project activity, i.e. AMS-I.C /15/. Neither a revision nor a deviation to the monitoring plan has been requested to CDM Executive Board.

The GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodology AMS-I.C (version 13), the formulae given in the VCU monitoring report /1/ version 1.2 of 20 July 2010 and also based on the validation opinion stated in the validation report issued by the DOE SGS United Kingdom Ltd /5/ for the registered CDM project activity.

The CO_2 emissions reductions were correctly calculated using quantity of steam generated, efficiency of the baseline coal fired boiler (100%) and CO_2 emission factor of coal of 96.1 tCO_2/TJ according to the baseline methodology AMS-I.C (version 13).

In addition, the flow meter data related to the quantity of steam generated, which was used in emissions reductions calculation spreadsheet, was checked for the monitoring period and was found to be appropriate.

All the instruments used for monitoring have been calibrated at the stated frequency which has been verified /6/.

3.6 Quality of Evidence to Determine Emission Reductions

DNV confirms that all parameters stated in the monitoring plan contained in the registered PDD /14/ are monitored and reported appropriately.

DNV was able to verify that Sterling Agro has adequate monitoring mechanisms where the required parameters have been monitored on a shift basis as compared to daily mentioned in the PDD. This was verified during the site visit when the plant records /10/ was verified to assess the correctness of the reported data. The biomass purchase data has also been verified from the purchase ledgers maintained at the plant premises. This in the opinion of DNV is appropriate.

The emission reductions have been correctly calculated at 19 007 tCO_2. The emission reductions are higher since the PLF (85%) is higher than what was envisaged in the PDD (70%) as the plant has operated for higher number of days as compared to what was envisaged /4/.

A complete set of data for the specified monitoring period 25 April 2009 to 5 February 2010 was available and verified while undertaking site visit room plant records maintained at site /10/.

3.7 Management and Operation System

Data is collected according to well defined data collection procedures: The monitoring and reporting of parameters is in accordance with well established operational procedures, no documented instructions were requested and reviewed. The site visit at the Dairy Product manufacturing unit confirmed that monitoring and reporting is carried out consistently and in line with established procedures and as per the requirements of the monitoring plan mentioned in the registered PDD /3/.

4 VERIFICATION/CERTIFICATION STATEMENT

Det Norske Veritas Certification AS (DNV) has performed the verification of the emission reductions reported for the CDM project activity "Biomass based steam generation project by Sterling Agro Industries Ltd*" (UNFCCC Registration Ref. No. 2952) for the period from 25 April 2009 to 5 February 2010. As these emission reductions occur prior to the registration of the project as CDM project activity, these emission reductions cannot be claimed as Certified Emission Reductions (CERs). The emission reductions are thus claimed as Voluntary Carbon Units (VCU) under the Voluntary Carbon Standard (VCS) 2007.*

Sterling Agro Industries Ltd *is responsible for the collection of data in accordance with the validated monitoring plan and the reporting of GHG emissions reductions from the project.*

It is DNV's responsibility to express an independent verification statement on the reported GHG emission reductions from the project. DNV does not express any opinion on the selected baseline scenario or on the validated and registered PDD, since the project design was previously assessed by the Designated Operational Entity (DOE) SGS United Kingdom Ltd. as part of the CDM validation and registration of the project. DNV recognizes the validation opinion of Designated Operational Entity (DOE) SGS United Kingdom Ltd. that the project design as documented is sound, reasonable and meets the relevant UNFCCC and host Party criteria. DNV also recognizes that the project was registered as a CDM project activity on 06 February 2010 under the UNFCCC reference number 2952.

DNV conducted the verification on the basis of the CDM monitoring methodology AMS-I.C – "Thermal energy for the user with or without electricity" (version 13), the monitoring plan included in the PDD of the project and the VCU monitoring report of 20 July 2010. The verification included i) checking whether the provisions of the monitoring methodology AMS-I.C (version 13) and the monitoring plan in the PDD were consistently and appropriately applied and ii) the collection of evidence supporting the reported data.

DNV's verification approach draws on an understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these. DNV planned and performed the verification by obtaining evidence and other information and explanations that DNV considers necessary to give reasonable assurance that reported GHG emission reductions are fairly stated.

In DNV's opinion, the GHG emissions reduction for the registered CDM project activity "Biomass based steam generation project by Sterling Agro Industries Ltd" as reported in the VCU Monitoring Report version 1.2 issued on 20 July 2010 are fairly stated and the project design meets all VCU Verification Criteria.

The GHG emission reductions were correctly calculated on the basis of the approved monitoring methodology of AMS-I.C (version 13) and the monitoring plan contained in the validated Project Design Document for the project.

Det Norske Veritas Certification AS is able to certify that the emission reductions from the "Biomass based steam generation project by Sterling Agro Industries Ltd*" during the period 25 April 2009 to 5 February 2010 amount to 19 007tonnes of CO_2 equivalent.*

DNV does not assume any responsibility towards the issuance and utilization of the VCUs hereby verified and certified. Request for issuance of VCUs shall be made by the project

proponent to an approved VCS Program Registry based on the requirements set out under the most recent version of the VCS Program Guidelines clause on VCS Registration[3].
The verification of reported emission reductions is based on the information made available to DNV and the engagement conditions detailed in this report. DNV cannot be held liable by any party for decisions made or not made based on this report.

New Delhi and Oslo, 21 December 2010

Nitin Kapoor
Project Manager

Michael Lehmann
Director of Technologies and Services
Det Norske Veritas Certification AS

[3] All Voluntary Carbon Units (VCU) are issued, held and cancelled in VCS registries. The VCS Association expects that multiple VCS registries will be available under the VCS and hopes to have registries approved under the VCS in the first half of 2008. Further information is available online (http://www.v-c-s.org)

5 REFERENCES

Documents provided by the Project Participants that relate directly to the project.

/1/ Sterling Agro Industries Limited, *VER/VCU Monitoring Report of Biomass based steam* generation project by Sterling Agro Industries Ltd *for the period 25 April 2009 to 5 February 2010 – version 1 dated 2 June 2010 and version 2 dated 20 July 2010.*

/2/ Sterling Agro Industries Limited, VCS PD, version 1dated 2 June 2010.

/3/ Sterling Agro Industries Limited *Project Design Document* for *Biomass based steam* generation project by Sterling Agro Industries Ltd version1.3 of 31 August 2009.

/4/ Spreadsheet for Calculation of Voluntary Emission Reductions (version 1 dated 2 June 2010 and version 2 dated 20 July 2010).

/5/ SGS United Kingdom Ltd: Validation report for the project activity (Reference No CDM.VAL2221) dated 4 January 2010.

/6/ Calibration certificates for the monitoring equipments as listed below:

Steam flow meter (Serial No 2k8060277) calibrated on 26 February 2009 valid till 25 February 2010 by Classic Instrumentation Pvt Ltd.

Steam and feed water temperature (Serial No 07046215) calibrated on 26 February 2009 valid till 25 February 2010 by Classic Instrumentation Pvt Ltd.

Steam pressure (Serial No 0408P601) calibrated on 26 February 2009 valid till 25 February 2010 by Classic Instrumentation Pvt Ltd.

Weighment system for rice husk (Serial No EB08MR051) dated 24 April 2009 valid till 23 April 2010 by Galaxy test and calibration lab.

Bomb calorimeter for calorific value of rice husk (Serial No 017-02-03) dated 24 July 2008, valid till 23 July 2009 and 21 July 2009 valid till 20 July 2010 by Classic Instrumentation Pvt Ltd.

All calibrations were found traceable to National Standards (NABL accredited laboratory).

/7/ IBR certificate by state boiler department for the boiler (Serial No UP-6510) dated 14 January 2009, valid till 13 July 2009, further extended till 24 August 2010.

/8/ Boiler handover report by M/s Cheema Boilers dated 30 April 2009 confirming the commissioning of the boiler on 24 April 2009 with a capacity of 15 TPH at a pressure of 21 Kg/cm^2.

The commissioning parameters indicate a final steam temperature of 225^0 C, pressure of 21 Kg/cm^2 with feed water temperature of 57^0C.

/9/ Sterling Agro Industries Limited:

Air Consent Ref No 119/C-4/09, dated 22 April 2009 valid from 1 January 2009 till 31 December 2009 and Ref No 170/C-4/10 dated nil valid from 1 January 2010 till 31 December 2010 by the State Pollution Control Board (UPPCB).

Water Consent Ref No 120/C-4/09, dated 22 April 2009 valid from 1 January 2009 till 31 December 2009 and Ref No 171/C-4/10 dated nil valid from 1 January 2010 till 31 December 2010 by the State Pollution Control Board (UPPCB).

/10/ Plant records recording the shift wise data for the boiler parameters.

/11/ Biomass assessment report carried out in February and March 2010 for the period

2009-2010 prepared by Enviroaid.

/12/ Fuel purchase ledger to confirm the quantity of rice husk procured during the current monitoring period.

/13/ Letter of undertaking dated 22 July 2010 by the project participant confirming that the project does not create any other form of environmental credits.

Background documents related to the design and/or methodologies employed in the design or other reference documents. Where applicable, Category 2 documents have been used to cross-check project assumptions and confirm the validity of information given in the Category 1 documents and in verification interviews.

/14/ *Validation and Verification Manual version 1.2*. http://www.vvmanual.info

/15/ Approved baseline and monitoring methodology: AMS I.C –"Thermal energy for the user with or without electricity" – version 13.

/16/ ISEA3000 (Revised) Assurance Engagements other than Audits or Reviews of Historical Financial Information.
http://www.ifac.org/IAASB/ProjectHistory.php?ProjID=0008.

/17/ ISO/FDIS 14064-3 "Greenhouse gases – Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions and employed a risk-based approach.
http://www.iso.org/iso/en/CatalogueDetailPage.CatalogueDetail?CSNUMBER=38700□tscopelist=PROGRAMME.

/18/ Voluntary Carbon Standard – VCS 2007.1: "*Voluntary Carbon Standard - Specification for the project-level quantification, monitoring and reporting as well as validation and verification of greenhouse gas emission reductions or removals*"..

/19/ Voluntary Carbon Standard 2007.1 (VCS 2007.1), 18 November 2008.

/20/ Voluntary Carbon Standard – VCS 2007.1: Policy Announcement from the VCS Association. "Further Guidance for Projects that are Registered in Two GHG Programs" dated 19 March 2008.

/21/ Voluntary Carbon Standard – VCS 2007.1: Policy Announcement from the VCS Association. "VCS 2007 Validation Date Deadline" dated 10 September 2008.

/22/ Voluntary Carbon Standard – VCS 2007.1: Project Description template (http://v-c-s.org/docs/VCS%20PD.doc

/23// Letter of Approval for "Biomass based steam generation project by Sterling Agro Industries Ltd" issued on 08 June 2009 by the Indian DNA to confirm the title

Persons interviewed during the initial verification, or persons contributed with other information that are not included in the documents listed above.

/24/ Mr Sharad Saluja, Director Sterling Agro

/25/ Mr. Sanjeev Tomar, General Manager, Sterling Agro

/26/ Mr. Ramavatar Sharma , Manager Purchase

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APPENDIX A

CORRECTIVE ACTION REQUESTS, CLARIFICATION REQUESTS AND FORWARD ACTION REQUESTS

Corrective action requests

CAR ID	Corrective action request	Response by Project Participants	DNV's assessment of response by Project Participants
CAR 1	The PP needs to demonstrate the surplus biomass availability in the region and clearly mention the values in the MR. of the temperature and pressure (and hence enthalpy) of steam and condensate return temperature.	The report for surplus biomass availability carried out by Enviroaid has been provided to the DOE. The results of the biomass assessment have been incorporated in version 2 of the monitoring report. As per the report, excess biomass availability in the region is 110%.	The biomass assessment report has been verified and the surplus biomass availability is now mentioned in the revised MR. The surplus has been correctly calculated at 110% and hence appropriately leakages have been taken as nil for the current verification period. The CAR is closed
CAR 2	The PP needs to review and use conservative values The PP also needs to correct the ER estimates as the initial calculations have calculated for the complete month of February , though the verification period is only till 5 February 2010.	Conservative values have now been used for determination of emission reductions. The minimum observed steam temperature and pressure readings for the month have been used whenever the observed readings are steam temperature and pressure have been found to be exceeding the design values. The design value of feed water temperature has been used though the monitored value through calibrated gauges was found to be much lower.	DNV confirms that conservative values have now been used to determine the emission reductions. The emission reductions have further been corrected to include emission reductions till 5 February 2010 only. This has resulted in emission reductions reducing from an initial estimate of 22 408 tCO_2 to 19 007 tCO_2.
CAR 3	The PP needs to provide and undertaking that the project will not create and environmental credit and there shall be no double accounting for credits.	Letter of undertaking dated 22 July 2010 by the project proponent stating that the project does not create any other form of environmental credits has been provided to the DOE.	The letter of undertaking has been verified by DNV

Clarification requests from this verification

CL ID	Clarification request	Response by Project Participants	DNV's assessment of response by Project Participants
CL #	No Clarification Request (CL) was identified.	Not applicable.	Not applicable.

Forward action requests from previous verification

FAR ID	Forward action request	Summary of how FAR has been addressed in this reporting period	Assessment of how FAR has been addressed
FAR #	No Forward Action Request (FAR) was identified from the previous verification process.	Not applicable.	Not applicable.

Forward action requests from this verification

FAR ID	Forward action request	Response by Project Participants	DNV's assessment of response by Project Participants
FAR #	No forward action request was identified for the next verification process.	Not applicable.	Not applicable.

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APPENDIX B

CLARIFICATION OF CLAUSES 1.12, 1.13, 1.14, 8.1 AND 8.2 OF THE VCS PD

Clarification of clauses 1.12, 1.13, 1.14, 8.1 and 8.2 of the VCS PD

Clarification of clauses 1.12, 1.13, 1.14, 8.1 and 8.2 of the VCS PD are as follows:

1.12 Demonstration to confirm that the project was not implemented to create GHG emissions primarily for the purpose of its subsequent removal or destruction.

It has been confirmed during the site visit that there is requirement of steam at the manufacturing facility and hence the project has been implemented to produce steam using renewable biomass as fuel which is the primary intent.

1.13 Demonstration that the project has not created another form of environmental credit (for example renewable energy certificates).

The project participant has provided an undertaking that the project will not create any environmental credit.

1.14 Project rejected under other GHG programs (if applicable):

The project has been registered as a CDM project and it does not fall into rejected projects under other GHG programs.

8.1 Proof of Title:

DNV has confirmed the title of the project from the Letter of Approval dated 08 June 2009 by the Indian DNA.

8.2 Projects that reduce GHG emissions from activities that participate in an emissions trading program (if applicable):

This is not applicable as the project is registered in UNFCCC (Registration ID -2952) and approved by Indian DNA.

APPENDIX C

CURRICULA VITAE OF THE VERIFICATION TEAM MEMBERS

NITIN KAPOOR

Nitin Kapoor holds a Bachelor in Chemical Engineering and is also a qualified Chartered Financial Analyst (CFA) He has an overall experience of 15 years and 6 months as on date. Prior to joining DNV he had experience of 10 years and 5 months in Oil & Gas as well as manufacturing sector (food) with leading MNC's like ITC, Coca Cola and Enron Oil and Gas. During his stint in industry his responsibilities included carrying out energy audits and to identify potential areas of improvement. His experience includes analysis of specific consumptions (primarily on energy, raw materials and utilities) of processes based on historical data, carrying out material balances (heat and mass), analysis of equipment performance and identification and measurement of energy saving opportunities. He has also been responsible for the operations of the complete Crude Distillation Unit in the refinery, complete platform operations in Oil and Gas sector as well as for the utilities like steam, AHU while in Maintenance at ITC. He also has been incharge of the ETP operations in Coca Cola and ITC as well as Water and Sewage treatment plants while working offshore. He has been responsible for EMS and QMS at ITC and Coca Cola.

He has experience of 3.5 years in validation and verification of numerous CDM projects within DNV. He has received extensive training in the CDM validation and verification process. He is an appointed validator for the CDM validation and verification program of DNV and has performed validation of several CDM projects. He is also a Lead Auditor for QMS, auditor for EMS and Safety. His qualification, industrial experience and project experience in CDM demonstrate his sufficient sectoral competence in Energy Generation from renewable energy sources, energy efficiency, heat and energy demand and waste/waste water treatment. His direct work experience in Oil and Gas and food sector demonstrates his sectoral competence in these industries.

ASTAKALA VIDYACHARAN

Astakala Vidyacharan, Auditor, DNV Hyderabad, India. He is a chemical engineer and prior to joining DNV in 2005, has had 11 years of direct work experience in various chemical industries. His work experience covers 4 years in project implementations in pesticide and fine chemical industries , including environment management activities; 7 years in process operations of of pesticide, natural products and fine chemical industries.

He has received extensive training in the CDM validation and verification process. He is an appointed validator for the CDM validation and verification program of DNV and has performed validation of several CDM projects. He is also a trained auditor for GHG accounting standards and involved audit of Corporate GHG accounting. He is a qualified ISO9001, ISO 14001 Lead auditor and OHSAS 18001 auditor who has performed several audits for various industrial sectors under these management systems. His qualification, industrial experience and experience in CDM facilitate him to assess renewable energy based on Hydro and Biomass , Energy Efficiency sectors, in particular to sufficient degree.

RAVI KUMAR

Mr. Ravi Kumar Prabhu holds Bachelor's Degree in Chemical Engineering and has done Post Graduate Diploma course in Management and has an overall working experience of around twenty five years. Prior to joining DNV has around twenty three years experience in Chemical process industry (fertilizer & petrochemical manufacturing) covering production, technical services including energy audits and efficiency studies, waste heat recovery, efficiency studies of boilers, power plants, safety audits,pollution control activities and waste water treatment. With respect to the Thermal Power Plant, the job assignment included the monitoring of flue gas stack temperatures and excess air, efffiacy of fuel additives, condition of boiler refractory and insulation of steam lines, residual life assessment of boilers etc. His experience also includes 7 years in the Process design of fertilizer & petrochemical plants, wherein he was involved in the development of process flow diagrams, development of P&IDs, equipment design, HAZOP studies, procurement and commissioning activities.

He has over two years experience in validation and verification of CDM projects in DNV and is also an EMS lead auditor.

His qualification, industrial experience and experience in CDM projects demonstrate sufficient sectoral competence in Chemical process industries and Thermal Energy Generation from fossil fuels.

SESHAN RANGANATHAN

Seshan Ranganathan holds a Bachelor's Degree in Chemical Engineering and has done diploma course in Management and completed the graduate ship course in Industrial Engineering and has an overall working experience of around twenty six years. Prior to joining DNV has around twenty four years experience in Chemical process industry (fertilizer & petrochemical manufacturing) covering production, technical services including energy audits and efficiency studies, waste heat recovery, efficiency studies of boilers ,power plants , safety audits and pollution control activities including waste water treatment, project management, corporate planning, sales, logistics in fertilizer & petrochemical industry . With respect to the thermal power plant the job assignment included the monitoring of flue gas exit temperatures, excess air used, efffiacy of fuel additivities,conditon of boiler refractory ,insulation of steam lines etc.The experience also includes 5 years in process design & engineering for chemical process industry.

He has experience of over two years in validation and verification of CDM projects in DNV.He has completed the EMS lead auditor course

His qualification, industrial experience and experience in CDM demonstrate his sufficient sectoral competence in Thermal Energy Generation from fossil fuels.

ANDREA LEIROZ

Mrs. Andrea Leiroz holds a Bachelor's Degree in Chemical Engineering, Master Degree in Material Science and Doctor Degree in Mechanical Engineering having an overall experience of around thirteen years.

She has experience of around 4 years in validation and verification of numerous CDM projects in DNV, both in Brazil & abroad.

Her qualification, experience in CDM demonstrates her sufficient sectoral competence in Energy Generation from renewable energy sources, Waste handling and disposal and Animal waste management.