



---

# VERIFICATION / CERTIFICATION REPORT

---

## “LAGES METHANE AVOIDANCE PROJECT” IN BRAZIL

UNFCCC REGISTRATION REF. No. 0268

VERIFICATION PERIOD:  
1 NOVEMBER 2004 TO 31 MAY 2006

REPORT N°.2006-1233

REVISION No. 01

DET NORSKE VERITAS



## VERIFICATION / CERTIFICATION REPORT

Date of first issue: 2006-07-26	Project No.: 45030011(05)
Approved by: Einar Telnes Director	Organisational unit: DNV Certification, International Climate Change Services
Client: Lages Bioenergética Ltda	Client ref.: Gabriel Mann dos Santos

DET NORSKE VERITAS AS

DNV Certification

Veritasveien 1,  
1322 HØVIK, Norway  
Tel: +47 67 57 99 00  
Fax: +47 67 57 99 11  
<http://www.dnv.com>  
Org. No: NO 945 748 931 MVA

### Summary:

Det Norske Veritas Certification Ltd (DNV) has performed the verification of the emission reductions reported for the "Lages Methane Avoidance Project" in Brazil (UNFCCC Registration Ref. No. 0268) for the period 1 November 2004 to 31 May 2006.

In our opinion, the GHG emission reductions reported for the project in the monitoring report of 10 July 2006 are fairly stated.

The GHG emission reductions were calculated correctly on the basis of the approved monitoring methodology AMS III.E (version 07) and the monitoring plan and formulae given in the registered Project Design Document of 21 September 2005.

Det Norske Veritas Ltd. is able to certify that the emission reductions from the "Lages Methane Avoidance Project" in Brazil during the period from 1 November 2004 to 31 May 2006 amount to 277 768 tonnes of CO<sub>2</sub> equivalent.

Report No.: 2006-1233		Subject Group: Environment	
Report title: “Lages Methane Avoidance Project” in Brazil			
Work carried out by: Luis Filipe Tavares			
Work verified by: Michael Lehmann			
Date of this revision: 2006-08-25	Rev. No.: 01	Number of pages: 7	

<b>Indexing terms</b>	
Key words Climate Change Kyoto Protocol Validation Clean Development Mechanism	Service Area Verification
	Market Sector
	Process Industry
<div><input checked="" type="checkbox"/> No distribution without permission from the client or responsible organisational unit</div> <div><input type="checkbox"/> free distribution within DNV after 3 years</div> <div><input type="checkbox"/> Strictly confidential</div> <div><input type="checkbox"/> Unrestricted distribution</div>	

© 2002 Det Norske Veritas AS

All rights reserved. This publication or parts thereof may not be reproduced or transmitted in any form or by any means, including photocopying or recording, without the prior written consent of Det Norske Veritas AS.



<b><i>Table of Content</i></b>	<b><i>Page</i></b>
1 INTRODUCTION .....	1
1.1 Objective	1
1.2 Scope	1
1.3 “Lages Methane Avoidance Project”	1
2 METHODOLOGY .....	2
2.1 Review of Documentation	2
2.2 Site Visit	3
2.3 Reporting of Findings	3
3 VERIFICATION FINDINGS .....	3
3.1 Project Implementation	3
3.2 Completeness of Monitoring	4
3.3 Accuracy of Emission Reduction Calculations	4
3.4 Quality of Evidence to Determine Emission Reductions	5
3.5 Management System and Quality Assurance	5
4 VERIFICATION STATEMENT .....	6
5 REFERENCES.....	7
Appendix A Verification Checklist	

***Abbreviations***

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction(s)
CH <sub>4</sub>	Methane
CO <sub>2</sub>	Carbon dioxide
CO <sub>2</sub> e	Carbon dioxide equivalent
DNV	Det Norske Veritas
DNA	Designated National Authority
ERU	Emission Reduction Units(s)
FAR	Forward Action Request
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
INMETRO	Instituto Nacional de Metrologia, Normalização e Qualidade Industrial (Metrology National Institute)
IPCC	Intergovernmental Panel on Climate Change
MCF	Methane conversion factor
MP	Monitoring Plan
N <sub>2</sub> O	Nitrous oxide
NGO	Non-governmental Organisation
ODA	Official Development Assistance
PDD	Project Design Document
UNFCCC	United Nations Framework Convention for Climate Change



## 1 INTRODUCTION

Lages Bioenergética Ltda has commissioned Det Norske Veritas Certification Ltd (DNV) to carry out the verification and certification of emission reductions reported for the “Lages Methane Avoidance Project” for the period 1 November 2004 to 31 May 2006. This report contains the findings from the verification and a certification statement for the certified emission reductions.

### 1.1 Objective

Verification is the periodic independent review and *ex post* determination by a Designated Operational Entity (DOE) of the monitored reductions of GHG emissions that have occurred as a result of the registered CDM project activity during a defined verification period.

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

The objective of this verification was to verify and certify emission reductions reported for the “Lages Methane Avoidance Project” for the period 1 November 2004 to 31 May 2006.

### 1.2 Scope

The scope of the verification is:

- To verify that actual monitoring systems and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan.
- 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.
- To verify that the reported GHG emission data is sufficiently supported by evidence.

The verification shall ensure that reported emission reductions are complete and accurate in order to be certified.

The verification team has, based on the recommendations in the Validation and Verification Manual /9/, employed a risk-based approach, focusing on the identification of significant reporting risks and verifying the mitigation measures for these.

### 1.3 “Lages Methane Avoidance Project”

The project avoids methane emissions from anaerobic decay of biomass in stockpiles through controlled combustion of biomass in a cogeneration plant, which generates electricity and thermal energy (steam). The biomass used is wood waste produced by several timber industries, which would otherwise be disposed inadequately and left for decay.

This electricity is supplied to the local distribution company, and the thermal energy from the cogeneration is supplied to industrial clients in the vicinity of the projects. Only emission reductions for the avoidance of methane emissions are claimed by the project. The project does not claim any emission reductions from displacing grid electricity or steam.



The main supplier of wood waste for the “Lages Methane Avoidance Project” are the neighbour wood industries Battistella (38% of the consumption) and Sofia (16%). Wood waste is also bought on the spot market (46%) and is supplied from other suppliers.

## 2 METHODOLOGY

The verification of the emission reductions has assessed all factors and issues that constitute the basis for emission reductions from the project. These reductions were assessed for the methane avoidance of wood waste biomass, and included:

- i) Lages Monitoring Plan Workbook of 2004, 2005 and 2006 with the amount of wood waste biomass purchased and consumed on the boiler, including the distance average of waste wood biomass transport, distance of ash transport to the disposal site and the consumption of diesel oil on internal transport of waste wood biomass;
- ii) Relation of biomass receipts bought by Lages Bioenergética Ltda from Battistella, Sofia and third suppliers on spot market from November 2004 to May 2006;
- iii) Monthly report of waste wood biomass consumed as fuel on boiler/turbo generator set from November 2004 to May 2006;

### *Verification team*

Luis Filipe Tavares	DNV Brazil	Team Leader
Vicente San Valero	DNV Brazil	GHG Auditor
Michael Lehmann	DNV Norway	Technical reviewer, Energy Sector Expert

### *Duration of verification*

Preparations:	06 June 2006
On-site verification:	08 - 09 June 2006
Reporting:	From 01 to 25 August 2006

## 2.1 Review of Documentation

The monitoring report of 10 July 2006 /1/ for the period 1 November 2004 to 31 May 2006 was assessed. Moreover, DNV assessed the following supporting documentation: a) Lages Monitoring Plan Workbook of 2004, 2005 and 2006 /5/, b) compilation of receipts for biomass bought by Lages Bioenergética Ltda from Battistella, Sofia and third suppliers on the spot market from November 2004 to May 2006 /6/, and c) monthly reports of fuel oil consumption of the boiler/turbo generator set from November 2004 to May 2006 /7/.

In addition, the project's Project Design Document (PDD) /2/, in particular the monitoring plan contained in the PDD, DNV's Validation Report of 14 February 2006 /3/ and DNV's Initial Verification Report of 24 July 2006 /4/ were assessed.

The monitoring report of 10 July 2006 has been made publicly available on the CDM website on 07 August 2006.



## 2.2 Site Visit

On 08 - 09 June 2006, DNV carried out a site visit at Lages Bioenergética Ltda in Lages municipality, Santa Catarina State. During this visit, DNV verified that the actual implementation of the project was as described in the PDD.

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

- Checking the data reported in the Lages Monitoring Plan Workbooks for 2004, 2005 and 2006 against the amount of wood waste purchased and consumed by the boiler. The check also included an assessment of the reported average distance of wood waste transports, the consumption of diesel oil for on-site transports of wood waste and transports of ash to the landfill of the Jorge Lacerda Thermoelectric Power Plant at Capivari de Baixo municipality.
- Checking the receipts for the wood waste bought by Lages Bioenergética Ltda from Battistella, Sofia and third suppliers on the spot market from November 2004 to May 2006. A sample of receipts was reviewed to verify reported wood waste amounts.
- Checking that the scale used to weight the trucks with biomass supplied from third parties is calibrated by INMETRO.
- Checking the monthly report of wood waste consumed as fuel by boiler/turbo generator set from November 2004 to May 2006;
- Checking the aggregation of monthly reports issued by Lages Bioenergética Ltda;
- Verifying the effectiveness of the data quality assurance and control.

## 2.3 Reporting of Findings

The verification was able to verify that the GHG emission reductions reported for the project in the monitoring report of 10 July 2006 are fairly stated.

# 3 VERIFICATION FINDINGS

This section summarises the findings from the verification of the emission reductions reported for the “Lages Methane Avoidance Project” in Brazil for the period 1 November 2004 to 31 May 2006. The findings of the verification are documented in more detail in the verification checklist given in Appendix A.

## 3.1 Project Implementation

The project was implemented as described in the PDD and the plant consists of a boiler AZ 200 MAX manufactured by Dedini with a capacity of 120 ton/h steam, fed with waste wood biomass, and a generator manufactured by Alston Power Brasil Ltda, with capacity of 28 MW, at nominal tension of 13.8 kV. The boiler has installed a gas washing system at the stack, which removes suspended particulates. The resulting effluent is an ash sludge which is sent to the Jorge Lacerda Thermoelectric Power Plant landfill at the Capivari de Baixo municipality, 680 km away from the project site.

The boilers and turbo generator control system are automated to assure continuous operation.



The main source of biomass is composed by biomass bought from the third party suppliers and transported by trucks to the project site.

### 3.2 Completeness of Monitoring

All indicators stated in the validated monitoring plan based on the monitoring methodology and AMS III.E (version 07) are monitored and reported.

### 3.3 Accuracy of Emission Reduction Calculations

The emissions in the project and the baseline scenario were correctly calculated. The amount of methane emissions avoided by the project has been calculated in accordance with the validated PDD and AMS-III.E (version 07). The methane avoidance was determined using IPCC default MCF, a DOC of 0.3 for wood waste and the IPCC default  $DOC_f$  of 0.77. According to the validated PDD, the wood waste at Battistella was stored in stockpiles of more than 5 meters depth, and according to Table 6.2 of the Reference Manual of the Revised 1996 IPCC Guidelines a methane conversion factor (MCF) of 0.8 is considered. For the wood waste supplied by Sofia and bought on the spot market a MCF of 0.4 is considered.

The amount of wood waste biomass received is measured with calibrated truck scale at the entrance of the project facilities. Moreover, the amount of biomass entering the boiler of the cogeneration plant is measured with a load cell (dynamic scale). Since different MCFs apply for the biomass depending on its origin, emission reductions are calculated considering the relative share of wood waste from the different suppliers.

Battistella and Sofia used to generate steam themselves using wood waste, without any electricity generation, before the implementation of the “Lages Methane Avoidance Project”. Due to this, the baseline considers that also in absence of the project activity 32 640 tons wood waste per year would have been burned by Battistella and 14 400 ton per year by Sofia. In accordance with the validated PDD, these amounts are thus subtracted from the amount of biomass supplied by Battistella and Sofia, respectively, in order to determine the methane emissions by the project activity. The baseline also considers spontaneous burning of wood waste which was observed for the wood waste left for decay at Battistella. The amount of wood waste from Battistella is discounted by 1% to account for combustion of wood waste in the baseline.

The project emissions, i.e. emissions of  $CH_4$  and  $N_2O$  from the combustion of wood waste have been calculated using the validated IPCC emission factors. Project emissions from on-site transportation have been determined based on the monthly recorded diesel consumption and applying the validated emission factor.

For the determination of leakage, i.e. emissions from off-site transportation of wood waste by trucks, average (weighted average) round trip distances and average truck capacities have been calculated based on the round trip distance, truck capacity and the amounts of wood waste delivered by each wood waste supplier. For the determination of emissions from off-site transportation of ash, the round trip distance to the disposal site and an average truck capacity has been considered.  $CO_2$ ,  $CH_4$  and  $N_2O$  emissions from off-site transport of biomass have been determined applying the validated emission factors for heavy duty diesel vehicles.

Total project emissions (project activity emissions and leakage) were determined to be 470 ton  $CO_{2e}$ , 2 399 ton  $CO_{2e}$  and 1 214 ton  $CO_{2e}$  in the years 2004, 2005 and 2006, respectively.





Project emissions are thus below the eligibility threshold for type III small-scale CDM project activities.

### **3.4 Quality of Evidence to Determine Emission Reductions**

Lages Bioenergética Ltda has an automated control system where operation data including the wood waste consumed is recorded. At 00:00 hrs every day the turbo generator operator manually reads the record of the totalized accumulated wood waste and includes this in the management report to be analysed by the operation manager.

The wood waste figures are recorded in a daily report and consolidated in a monthly report. As the feed scale record is cumulative, the sum of all wood waste since start up is the same of actual reading.

The relative share of wood waste from the different suppliers is determined based on the receipts of wood waste bought from third party suppliers and purchased amounts are registered in the Electronic Planning Production Control System.

### **3.5 Management System and Quality Assurance**

Data is collected according to well defined data collection procedures:

- i) The biomass bought from third party suppliers is recorded in the Electronic Planning Production Control System and has good traceability and consistency.
- ii) The biomass consumed by the boiler is recorded with a load cell (dynamic scale) installed on the feeding system of the boiler and is recorded in the Electronic Planning Production Control System.
- iii) Data is processed by electronic spreadsheets to calculate emission reductions and to produce the monitoring report.
- iv) Lages Bioenergética Ltda has a Quality Management System Certified to ISO 9001:00 and is in the process of obtaining ISO 14001 certification;
- v) The monitoring report is prepared by the CDM Support Engineer based on reviewed records from the Electronic Planning Production Control System.



#### 4 VERIFICATION STATEMENT

Det Norske Veritas Certification Ltd (DNV) has performed the verification of the emission reductions reported for the “Lages Methane Avoidance Project” (UNFCCC Registration Ref. No. 0268) for the period 1 November 2004 to 31 May 2006.

Lages Bioenergética Ltda 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 conducted the verification on the basis of the monitoring methodology AMS III.E (version 07), the monitoring plan included in the PDD of the project and the monitoring report of 10 July 2006. The verification included i) checking whether the provisions of the monitoring methodology AMS III.E (version 07) 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 reported for the “Lages Methane Avoidance Project” as reported in the Monitoring Report issued on 10 July 2006 are fairly stated.

The GHG emission reductions were correctly calculated on the basis of the approved monitoring methodology of AMS III.E (version 07) and the monitoring plan contained in the validated PDD for the project of 21 September 2005.

Det Norske Veritas Certification Ltd is able to certify that the emission reductions from the “Lages Methane Avoidance Project” during the period 1 November 2004 to 31 May 2006 amount to 277 768 tonnes of CO<sub>2</sub> equivalent.

Rio de Janeiro, 25 August 2006

Luis Filipe Aboim Tavares  
CDM Auditor  
DNV Rio de Janeiro, Brazil

Oslo, 25 August 2006

Michael Lehmann  
Technical Director, Int. Climate Change Services  
Det Norske Veritas Certification Ltd.



## 5 REFERENCES

*Documents provided by the project participants that relate directly to the project.*

- /1/ Lages Bioenergética Ltda: *Monitoring Report – “Lages Methane Avoidance Project”*: 1 November 2004 to 31 May 2006, version of 10 July 2006.
- /2/ Lages Bioenergética Ltda: *Project Design Document of the “Lages Methane Avoidance Project”*, version 2 of 21 September 2005.
- /3/ Det Norske Veritas Certification Ltd.: *Validation Report for “Lages Methane Avoidance Project”*. DNV Report 2005-0935 Rev 3 of 14 February 2006
- /4/ Det Norske Veritas Certification Ltd.: *Initial Verification Report for “Lages Methane Avoidance Project”*. DNV Report 2006-0003 Rev 2 of 24 July 2006
- /5/ Lages Monitoring Plan Workbook of 2004, 2005 and 2006 with the amount of wood waste biomass purchased and consumed on the boiler, including the distance average of waste wood biomass transport, and the consumption of diesel oil on internal transport of waste wood biomass and transport of ash to the disposal site in Capivari de Baixo municipality.
- /6/ Compilation of receipts for biomass bought by Lages Bioenergética Ltda from Battistella, Sofia and other third party suppliers from the spot market from November 2004 to May 2006
- /7/ Monthly report of wood waste consumed as fuel by the boiler/turbo generator set from November 2004 to May 2006;
- /8/ Toledo Scales calibration certificate INMETRO # 527852 e 527853 issued on 20 July 2006

*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.*

- /9/ International Emission Trading Association (IETA) & World Bank's Prototype Carbon Fund (PCF): *Validation and Verification Manual*. <http://www.vvmanual.info>
- /10/ Appendix B of the simplified modalities and procedures for small-scale CDM project activities, *Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories*, Version 07, 28 November 2005

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

- /11/ Gabriel Mann dos Santos – CDM Support Engineer - Tractebel Energia
- /12/ Marcio Daian Neves – Lages Operation Manager – Tractebel Energia
- /13/ Artur Roberto Frota Ellwanger – Plant Manager Tractebel Energia

- o0o -

## **APPENDIX A**

---

### **VERIFICATION CHECKLIST**

## Initial Verification Checklist

OBJECTIVE	MoV*	COMMENTS	Concl.(incl FARs/CARs)
<b>A. Opening Session</b>			
<b>A.1. Introduction to audits</b>	DR	<i>Lages Bioenergética Ltda has commissioned Det Norske Veritas Certification Ltd. (DNV) to carry out the verification and certification of emission reductions reported for the “Lages Methane Avoidance Project” for the period 1 November 2004 to 31 May 2006.</i>	OK
<b>A.2. Contractors for equipment and installation works</b> <i>Who has installed the equipment? Who was contracted for planning etc.?</i>	I,W	<i>AZ 200 MAX boiler manufactured by Dedini with capacity of 120 ton/h steam, feed with wood waste and a generator manufactured by Alston Power Brasil Ltda, Model SGHW 1250 C4 BA with capacity of 28 MW, at nominal tension of 13.8 kV</i>	OK
<b>A.3. Actual status of installation works</b> <i>Project installation should be finished at time of initial verification in so far as the project should be ready to generate emission reductions afterwards.</i>	I,W	<i>The installation of cogeneration plant was concluded on 23 December 2003 and the project was operational from 01 November 2004.</i>	OK
<b>B. Implementation of the project</b> <i>This part is covering the essential checks during the on-site inspection at the project's site, which is indispensably for an initial verification</i>			
<b>B.1. Physical components</b> <i>Check the installation of all required facilities and equipment as described by the PDD.</i>	D,I	<i>AZ 200 MAX boiler manufactured by Dedini with capacity of 120 ton/h steam, feed with wood waste and a generator manufactured by Alston Power Brasil Ltda, Model SGHW 1250 C4 BA with capacity of 28 MW, at nominal tension of 13.8 kV</i>	OK
<b>B.2. Project boundaries</b> <i>Check whether the project boundaries are still in</i>	I,W	<i>The project comprises a new 28MW biomass electricity cogeneration plant, using wood waste that in absence of the project is dumped and left to decay, and the project thus avoids the release of methane to the atmosphere.</i>	OK

\* MoV: Means of Verification - Interview (I), Document review (DR), Witnessing of actual practise (W), Inspection (Ins)

OBJECTIVE	MoV*	COMMENTS	Concl.(incl FARs/CARs)
<i>compliance with the ones indicated by the PDD.</i>		<p><i>The source of wood waste is wood waste bought from third party suppliers (mills or landfills), transported by trucks to the project site.</i></p> <p><i>This electricity is supplied to the local distribution company, and the thermal energy from the cogeneration is supplied to industrial clients in the vicinity of the projects. Only emission reductions for the avoidance of methane emissions are claimed by the project.</i></p>	
<b>B.3. Monitoring and metering systems</b> <i>Check whether the required metering systems have been installed. The meters have to comply with appropriate quality standards applicable for the used technology.</i>	DR,I,W	<p><i>The main suppliers of wood waste are the neighbouring wood industries Battistella (38%) and Sofia (16%). Moreover, wood waste is bought from others suppliers on the spot market (46%).</i></p> <p><i>The amount of wood waste biomass received is measured with calibrated truck scale at the entrance of the project facilities. Moreover, the amount of biomass entering the boiler of the cogeneration plant is measured with a load cell (dynamic scale). Since different MCFs apply for the biomass depending on its origin, emission reductions are calculated considering the relative share of wood waste from the different suppliers.</i></p> <p><i>The diesel use associated with on-site transportations is determined based on fuel purchase receipts and fuel storage records.</i></p> <p><i>Average round trip distances and average truck capacities for transport of wood waste from third party suppliers disposal site have been calculated based on the round trip distance, truck capacity and the amounts of wood waste delivered by each wood waste supplier.</i></p> <p><i>The round trip distance to the disposal site and an average truck capacity has been determined.</i></p>	OK
<b>B.4. Data uncertainty</b> <i>How will data uncertainty be determined for later calculations of emission reductions? Is this in compliance with monitoring and metering equipment?</i>	DR, W	<p><i>The amount of wood waste biomass received is measured with calibrated truck scale at the entrance of the project facilities. Moreover, the amount of biomass entering the boiler of the cogeneration plant is measured with a load cell (dynamic scale).</i></p> <p><i>The validated emission factors to determine project and baseline emissions and leakage are correctly applied.</i></p>	OK
<b>B.5. Calibration and quality assurance</b>	DR, W	<i>The scales used to weigh trucks and biomass is calibrated by INMETRO.</i>	OK

\* MoV: Means of Verification - Interview (I), Document review (DR), Witnessing of actual practise (W), Inspection (Ins)

OBJECTIVE	MoV*	COMMENTS	Concl.(incl FARs/CARs)
<p><i>Check how monitoring and metering systems are subject to calibration and quality assurance routines</i></p> <p><i>a) with installation</i></p> <p><i>b) during future operation</i></p>			
<p><b>B.6. Data acquisition and data processing systems</b></p> <p><i>Check the eligibility of used systems.</i></p>	DR, W	<p><i>Lages Bioenergética Ltda has an automated control system where operation data including the wood waste consumed is recorded. At 00:00 hrs every day the turbo generator operator manually reads the record of the totalized accumulated wood waste and includes this in the management report to be analysed by the operation manager.</i></p> <p><i>These figures are recorded in a daily report and consolidated in a monthly report. As the feed scale record is cumulative, the sum of all wood waste since start up is the same of actual reading.</i></p> <p><i>The relative share of wood waste from the different suppliers is determined based on the receipts of wood waste bought from third party suppliers and purchased amounts are registered in the Electronic Planning Production Control System.</i></p>	OK
<p><b>B.7. Reporting procedures</b></p> <p><i>Check how reports with relevance for the later determination of emission reductions will be generated</i></p>	DR, W	<p><i>Data is collected according to well defined data collection procedures:</i></p> <ul style="list-style-type: none"> <li><i>i) The biomass bought from third party suppliers is recorded in the Electronic Planning Production Control System and has good traceability and consistency.</i></li> <li><i>ii) The biomass consumed by the boiler is recorded with a load cell (dynamic scale) installed on the feeding system of the boiler and is recorded in the Electronic Planning Production Control System.</i></li> <li><i>iii) Data is processed by electronic spreadsheets to calculate emission reductions and to produce the monitoring report.</i></li> <li><i>iv) Lages Bioenergética Ltda has a Quality Management System Certified to ISO 9001:00 and is in the process of obtaining ISO 14001 certification;</i></li> <li><i>v) The monitoring report is prepared by the CDM Support Engineer based on reviewed records from the Electronic Planning Production Control System.</i></li> </ul>	OK
<b>B.8. Documented instructions</b>	DR, W	<i>Lages Bioenergética Ltda has a Quality Management System Certified to</i>	OK

\* MoV: Means of Verification - Interview (I), Document review (DR), Witnessing of actual practise (W), Inspection (Ins)



OBJECTIVE	MoV*	COMMENTS	Concl.(incl FARs/CARs)
<i>Check whether the personnel performing tasks with sensitivity for the monitoring of emission reductions have access and knowledge of documented instructions, forming a part of the project's management system.</i>		<i>ISO 9001:00 and is in the process of obtaining ISO 14001 certification.</i>	
<b>B.9. Qualification and training</b> <i>Check whether the personnel performing tasks with sensitivity for the monitoring of emission reductions has the appropriate competences, capabilities and qualifications to ensure the required data quality.</i>	DR, W	<i>The operators of the boiler have an obliged boiler operator course (NR13 Work Legislation) and have been trained to operate the system control by the manufacturer. Readings of the electricity generation are included in the daily report.</i>  <i>The operators of the Planning Production Control System have been trained to produce monthly reports.</i>	OK
<b>B.10. Responsibilities</b> <i>Check whether all tasks required to gather data and prepare a monitoring report with the necessary quality have been allocated to responsible employees.</i>	DR, I	<i>The responsibilities for monitoring and reporting of emission reductions are with the boiler operator/supervisor, the operation manager, plant manager and CDM support engineer.</i>	OK
<b>B.11. Troubleshooting procedures</b> <i>Check whether there are possibilities of redundant data monitoring in case of having problems with the used monitoring equipment. Such procedures may reduce risks for the buyers of emission reductions (e.g. the Client)</i>	DR, W	<i>In case of problems with the dynamic scale the biomass consumption by the boiler in a certain period could be monitored considering the initial biomass inventory plus the biomass amount purchased in that period minus the final biomass inventory.</i>	OK
<b>C. Internal Data</b> <i>Identifying the internal GHG data sources and ways in which the data have been collected, calculated, processed, aggregated and stored should be part of initial verification to assess accuracy and reliability of the internal GHG data..</i>			
<b>C.1. Type and sources of internal data</b>	DR, W	<i>See B.3</i>	OK



OBJECTIVE	MoV*	COMMENTS	Concl.(incl FARs/CARs)
<i>Acquire information on type and source of internal GHG data, which is used in calculations of emission reductions. E.g..” continuous direct measurements”, “site-specific correlations”, “periodic direct measurements”, “use of models” and/or “use of default emissions factors”.</i>			
<b>C.2. Data collection</b> <i>How is data collected and processed? What are the means of quantifying emissions from the different data sources?</i>	DR, W	<i>See B.3</i>	OK
<b>C.3. Quality assurance</b> <i>Does internal data collection underlie sufficient quality assurance routines?</i>	DR,I	<i>See B.7 and B.10</i>	OK
<b>C.4. Significance and reporting risks</b> <i>Assess the significance and reporting risks related to the different internal data sources. Potential reporting risks may be related to the calculation methods, accuracy of data sources and data collection and/or the information systems from which data is obtained. The significance of and risks associated with the data source indicate the level of verification effort required at a later stage.</i>	W,I	<i>No significant risks were identified. The reporting of emission reduction considers all assumptions identified in the PDD, and the system for collecting and recording data assure consistent monitoring and reporting.</i>	OK
<b>D. External Data</b> <i>Especially for data of baseline emissions there might be the necessity to include external data sources. The access to such data and a proof of data quality should be part of initial verification. If it is deemed to be necessary, an entity delivering such data should be audited.</i>			
<b>D.1. Type and sources of external data</b>	DR	<i>The factors to calculate the methane avoidance are established by IPCC and other official sources.</i>	OK

\* MoV: Means of Verification - Interview (I), Document review (DR), Witnessing of actual practise (W), Inspection (Ins)

OBJECTIVE	MoV*	COMMENTS	Concl.(incl FARs/CARs)
<i>Acquire information on type and source of external data, which is used in calculations of emission reductions</i>			
<b>D.2. Access to external data</b> <i>How is data transferred? How can reproducibility of data set be ensured?</i>	DR	<i>See D.1</i>	OK
<b>D.3. Quality assurance</b> <i>Does external data underlie any quality assurance routines?</i>	DR	<i>See B.10</i>	OK
<b>D.4. Emergency procedures</b> <i>Are there any procedures which will be applicable if there is no access to relevant external data?</i>	DR	<i>Not applicable.</i>	--
<b>E. Environmental and Social Indicators</b> <i>A Monitoring Plan may comprise environmental and/or social indicators which could be necessary to monitor for the success of the project activity.</i>			
<b>E.1. Implementation of measures</b> <i>A project activity may demand for the installation of measures (e.g. filtering systems or compensation areas), which are exceeding the local legal requirements. A check of the implementation or realization of such measures should be part of the initial verification.</i>	DR	<i>Not applicable.</i>	--

OBJECTIVE	MoV*	COMMENTS	Concl.(incl FARs/CARs)
<b>F. Management and Operational System</b> <i>In order to ensure a successful operation of a Client project and the credibility and verifiability of the ERs achieved, the project must have a well defined management and operational system.</i>			
<b>F.1. Documentation</b> <i>The system should be documented by manuals and instructions for all procedures and routines with relevance to the quality of emission reductions. The accessibility of such documentations to persons working on the project has to be secured.</i>	DR,I	See B.7	OK
<b>F.2. Qualification and training</b> <i>The system should describe the requirements on qualification and the need of training programs for all persons working on the emission reduction project. Performed training programs and certificates should be archived by the system.</i>	DR,I	See B.9	OK
<b>F.3. Allocation of responsibilities</b> <i>The allocation of responsibilities should be documented in written manner.</i>	DR,I	See B.10	OK
<b>F.4. Emergency procedures</b> <i>The system should contain procedures which provide emergency concepts in case of unexpected problems with data access and/or data quality.</i>	DR	Not applicable.	--
<b>F.5. Data archiving</b> <i>The system should provide routines for the archiving of all data which is required for verifying the project's performance in the context of consecutive verifications.</i>	DR,I	See B.8	OK

\* MoV: Means of Verification - Interview (I), Document review (DR), Witnessing of actual practise (W), Inspection (Ins)

OBJECTIVE	MoV*	COMMENTS	Concl.(incl FARs/CARs)
<p><b>F.6. Monitoring report</b></p> <p><i>The system includes procedures for the calculation of emission reductions and the preparation of the monitoring report.</i></p>	DR,I	<p><i>The verification of the emission reductions has assessed all factors and issues that constitute the basis for emission reductions from the project.</i></p> <p><i>The emissions in the project and the baseline scenario were correctly calculated. The amount of methane emissions avoided by the project has been calculated in accordance with the validated PDD and AMS-III.E (version 07). The methane avoidance was determined using IPCC default MCF, a DOC of 0.3 for wood waste and the IPCC default DOC<sub>f</sub> of 0.77. According to the validated PDD, wood waste at Battistella was stored in stockpiles of more than 5 meters depth, and according to Table 6.2 of the Reference Manual of the Revised 1996 IPCC Guidelines a methane conversion factor (MCF) of 0.8 is considered. For the wood waste supplied by Sofia and bought on the spot market a MCF of 0.4 is considered.</i></p> <p><i>Battistella and Sofia used to themselves generate steam using wood waste, without electricity generation, before the implementation of the “Lages Methane Avoidance Project”. Due to this, the baseline considers that 32 640 tons wood waste per year would have been burned by Battistella and 14 400 ton per year by Sofia also in absence of the project activity. In accordance with the validated PDD, these amounts are thus subtracted from the amount of biomass supplied by Battistella and Sofia, respectively, in order to determine the methane emissions by the project activity. The baseline also consider spontaneous burning of wood waste which was observed for the wood waste left for decay at Battistella, and of the amount of wood waste from Battistella is discounted by 1% to account for combustion of wood waste in the baseline.</i></p> <p><i>The reported emission reductions were assessed based on the following:</i></p> <p><i>Lages Monitoring Plan Workbook of 2004, 2005 and 2006 with the amount of wood waste biomass purchased and consumed on the boiler, including the distance average of waste wood biomass transport, distance of ash transport to the disposal site and the consumption of diesel oil on internal transport of waste wood biomass:</i></p> <p><i>Compilation of receipts for biomass bought by Lages Bioenergética Ltda from Battistella, Sofia and other third party suppliers from the spot market</i></p>	OK

\* MoV: Means of Verification - Interview (I), Document review (DR), Witnessing of actual practise (W), Inspection (Ins)

OBJECTIVE	MoV*	COMMENTS	Concl.(incl FARs/CARs)
		<i>from November 2004 to May 2006</i> <i>Monthly report of wood waste consumed as fuel in the boiler/turbo generator set from November 2004 to May 2006;</i>	
<b>F.7. Internal audits and management review</b> <i>The system includes internal control procedures, which allow the identification and solution of problems at an early stage.</i>	DR,I	<i>See B.8 and B.10</i>	OK

- o0o -