VERIFICATION REPORT

JALLES MACHADO S.A

VERIFICATION OF THE JALLES MACHADO BAGASSE COGENERATION PROJECT (JMBCP)

(CDM Registration Reference Number 0187)

REPORT NO. BRAZIL-VER/0033/2008

REVISION NO. 01

BUREAU VERITAS CERTIFICATION

VERIFICATION REPORT

Date of first issue:	Organizational unit:
02/07/2008	Bureau Veritas Certification Holding SA
Client:	**Client ref.:**
Jalles Machado S.A.	Ivan Zanatta

Summary:

Bureau Veritas Certification has made the verification of the Jalles Machado Bagasse Cogeneration Project (JMBCP), CDM Registration Reference Number 0187, of Jalles Machado S.A., located in Fazenda São Pedro, Goianésia, State of Goiás, Brazil on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM rules and modalities and the subsequent decisions by the CDM Executive Board, as well as the host country criteria.

The verification scope is defined as a periodic independent review and ex post determination by the Designated Operational Entity of the monitored reductions in GHG emissions during defined verification period, and consisted of the following three phases: i) desk review of the project design and the baseline and monitoring plan; ii) follow-up interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final verification report and opinion. The overall verification, from Contract Review to Verification Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

The first output of the verification process is a list of Clarification, Corrective Actions Requests, Forward Actions Requests (CR, CAR and FAR), presented in Appendix A.

In summary, Bureau Veritas Certification confirms that the project is implemented as planned and described in validated and registered project design documents. Installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately. The monitoring system is in place and the project is ready to generate GHG emission reductions. The GHG emission reduction is calculated without material misstatements.

Our opinion relates to the project's GHG emissions and resulting GHG emission reductions reported and related to the valid and registered project baseline and monitoring, and its associated documents.

Report No.:	Subject Group:
BRAZIL-ver/0033/2008	CDM
Project title:	
Jalles Machado Bagasse Cogeneration Project (JMBCP)	
Work carried out by:	
Antonio Daraya	
Work verified by:	
Sergio Carvalho	

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Indexing terms

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Abbreviations change / add to the list as necessary

AGMA	Agência Goiana de Meio Ambiente
ANEEL	National Agency for Electrical Energy
BVC	Bureau Veritas Certification
CDM	Clean Development Mechanism
CELG	Centrais Elétricas de Goiás
CER	Certified Emission Reductions
CR	Clarification Request
CO_2	Carbon Dioxide
DNA	Designated National Authority
DOE	Designated Operational Entity
EB	Executive Board
FAR	Forward Action Request
I	Interview
IETA	International Emissions Trading Association
KP	Kyoto Protocol
MoV	Means of Verification
MP	Monitoring Plan
NGO	Non Government Organization
PCF	Prototype Carbon Fund
PDD	Project Design Document
PPA	Power Purchase Agreement
UNFCCC	United Nations Framework Convention for Climate Change
VVM	Validation and Verification Manual

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1 INTRODUCTION

Jalles Machado S.A. has commissioned Bureau Veritas Certification to verify the emissions reductions of its CDM project Jalles Machado Bagasse Cogeneration Project (JMBCP) (hereafter called "the project") located in Fazenda São Pedro, Goianésia, State of Goiás, Brazil. This report summarizes the findings of the verification of the project, performed on the basis of UNFCCC criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

1.1 Objective

Verification is the periodic independent review and ex post determination by the DOE of the monitored reductions in GHG emissions during defined verification period.

The objective of verification can be divided in Initial Verification and Periodic Verification.

UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM rules and modalities and the subsequent decisions by the CDM Executive Board, as well as the host country criteria.

1.2 Scope

The verification scope is defined as an independent and objective review of the project design document, the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations.

The verification is not meant to provide any consulting towards the Client. However, stated requests for forward actions and/or corrective actions may provide input for improvement of the project monitoring towards reductions in the GHG emissions.

1.3 GHG Project Description

The project activity consists of increasing the efficiency in the bagasse (a renewable fuel source, residue from sugarcane processing) cogeneration facility at Jalles Machado, a Brazilian sugar mill. With the implementation of the project, the mill has been able to sell electricity to the national grid, avoiding the dispatch of same amount of energy produced by fossil-fuelled thermal plants to that grid.

The initiative avoids CO_2 emissions, also contributing to the regional and national sustainable development.

Before the Expansion Plan (2000), Jalles Machado counted on two 21 kgf/cm² pressure boilers that generated, each one, 100 tons of steam per hour and two back pressure turbo-generators (1 x 5 MW (G1) and 1 x 1,2 MW) , which during the 3 phases of the Expansion Plan were replaced by higher efficiency ones,

expanding its total installed power generation capacity from 10 MW to 38 MW. The project was divided into 3 phases as described below.

Phase 1 (2001):
In this first phase a new TOSHIBA 5 MW backpressure turbo generator was installed adding more energy generation capacity to the plant – which consisted of two 21 kgf/cm² boilers that provided 100 ton of steam per hour at 450 ºC each and two backpressure turbo generators (1 x 5 MW and 1 x 1,2 MW). Therefore, the total installed capacity for this phase, as that one 1,2 MW backpressure turbogenerator was deactivated, is 10 MW. However, 2 MW was the installed capacity considered to supply the grid, which was sold to Enron. The total amount of energy produced in this phase and sold to the local utility was 3.877 MWh.

Phase 2 (2002):
By the year 2002, the JMBCP continued the investment from the year 2001, to reach a higher capacity and efficiency for exploiting biomass through the construction of a 42 kgf/cm² high-efficiency boiler which will produce 200 ton of steam per hour, in substitution of one of its 21 kgf/cm² boiler. In this phase, the total amount of clean energy dispatched in order to supply the regional grid – avoiding the marginal plants to dispatch their energy - was 8.985 MWh. Companhia Paulista de Força e Luz (CPFL) is the utility signing the Power Purchase Agreement (PPA) in this second phase.

Phase 3 (2003):
For this phase, one 28 MW backpressure turbo generator was installed and another 42 kgf/cm² high efficient boiler – producing 200 ton of steam per hour – is replacing the old 21 kgf/cm² boiler.
Presently (2008), the two 5 MW backpressure turbo generators are not operating anymore for the project.

1.4 Verification team

The verification team consists of the following personnel:

Antonio Daraya
Bureau Veritas Certification Team Leader, Climate Change Verifier

Sergio Carvalho
Bureau Veritas Certification Internal reviewer

2 METHODOLOGY

The verification is a desk review and field visit, including discussions and interviews with selected experts and stakeholders.

In order to ensure transparency, a verification protocol was customized for the project, according to the Validation and Verification Manual (IETA/PCF) a verification protocol is used as part of the verification. The protocol shows, in a transparent manner, criteria (requirements), means of verification and the results from verifying the identified criteria. The verification protocol serves the following purposes:

- It organises, details and clarifies the requirements the project is expected to meet; and
- It ensures a transparent verification process where the verifier will document how a particular requirement has been verified and the result of the verification;

The verification protocol consists of one table under Initial Verification checklist and three tables under Periodic verification checklist. The different columns in these tables are described in Figure 1.

The overall verification, from Contract Review to Verification Report & Opinion, was conducted using Bureau Veritas Certification procedures.

The completed verification protocol is enclosed in Appendix A to this report.

Initial Verification Protocol Table 1			
Objective	**Reference**	**Comments**	**Conclusion (CARs/FARs)**
The requirements the project must meet	Gives reference to where the requirement is found.	Description of circumstances and further comments on the conclusion	This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR) of risk or non-compliance of the stated requirements. Forward Action Request (FAR) indicates essential risks for further periodic verifications.

Periodic Verification Checklist Protocol Table 2: Data Management System/Controls		
Identification of potential reporting risk	**Identification, assessment and testing of management controls**	**Areas of residual risks**
The project operator's data management system/controls are assessed to identify reporting risks and to assess the data management system's/control's ability to mitigate reporting risks. The GHG data management system/controls are assessed against the expectations detailed in the table.	A score is assigned as follows: • Full - all best-practice expectations are implemented. • Partial - a proportion of the best practice expectations is implemented • Limited - this should be given if little or none of the system component is in place.	Description of circumstances and further commendation to the conclusion. This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR) of risk or non compliance with stated requirements. The corrective action requests are numbered and presented to the client in the verification report. The Initial Verification has additional Forward Action Requests (FAR). FAR indicates essential risks for further periodic verifications.

Periodic Verification Protocol **Table 3: GHG calculation procedures and management control testing**

Identification of potential reporting risk	**Identification, assessment and testing of management controls**	**Areas of residual risks**
Identify and list potential reporting risks based on an assessment of the emission estimation procedures, i.e. ➢ the calculation methods, ➢ raw data collection and sources of supporting documentation, ➢ reports/databases/information systems from which data is obtained. Identify key source data. Examples of source data include metering records, process monitors, operational logs, laboratory/analytical data, accounting records, utility data and vendor data. Check appropriate calibration and maintenance of equipment, and assess the likely accuracy of data supplied. Focus on those risks that impact the accuracy, completeness and consistency of the reported data. Risks are weakness in the GHG calculation systems and may include: ➢ manual transfer of data/manual calculations, ➢ unclear origins of data, ➢ accuracy due to technological limitations, ➢ lack of appropriate data protection measures? For example, protected calculation cells in spreadsheets and/or password restrictions.	Identify the key controls for each area with potential reporting risks. Assess the adequacy of the key controls and eventually test that the key controls are actually in operation. Internal controls include (not exhaustive): ➢ Understanding of responsibilities and roles ➢ Reporting, reviewing and formal management approval of data; ➢ Procedures for ensuring data completeness, conformance with reporting guidelines, maintenance of data trails etc. ➢ Controls to ensure the arithmetical accuracy of the GHG data generated and accounting records e.g. internal audits, and checking/ review procedures; ➢ Controls over the computer information systems; ➢ Review processes for identification and understanding of key process parameters and implementation of calibration maintenance regimes ➢ Comparing and analysing the GHG data with previous periods, targets and benchmarks. When testing the specific internal controls, the following questions are considered: 1. Is the control designed properly to ensure that it would either prevent or detect and correct any significant misstatements? 2. To what extent have the internal	Identify areas of residual risks, i.e. areas of potential reporting risks where there are no adequate management controls to mitigate potential reporting risks Areas where data accuracy, completeness and consistency could be improved are highlighted.

	controls been implemented according to their design; 3. To what extent have the internal controls (if existing) functioned properly (policies and procedures have been followed) throughout the period? 4. How does management assess the internal control as reliable?	

Periodic Verification Protocol Table 4: Detailed audit testing of residual risk areas and random testing		
Areas of residual risks	**Additional verification testing performed**	**Conclusions and Areas Requiring Improvement (including Forward Action Requests)**
List the residual areas of risks (Table 2 where detailed audit testing is necessary. In addition, other material areas may be selected for detailed audit testing.	The additional verification testing performed is described. Testing may include: 1. Sample cross checking of manual transfers of data 2. Recalculation 3. Spreadsheet 'walk throughs' to check links and equations 4. Inspection of calibration and maintenance records for key equipment ➢ Check sampling analysis results ➢ Discussions with process engineers who have detailed knowledge of process uncertainty/error bands.	Having investigated the residual risks, the conclusions should be noted here. Errors and uncertainties should be highlighted. Errors and uncertainty can be due to a number of reasons: ➢ Calculation errors. These may be due to inaccurate manual transposition, use of inappropriate emission factors or assumptions etc. ➢ Lack of clarity in the monitoring plan. This could lead to inconsistent approaches to calculations or scope of reported data. ➢ Technological limitations. There may be inherent uncertainties (error bands) associated with the methods used to measure emissions e.g. use of particular equipment such as meters. ➢ Lack of source data. Data for some sources may not be cost effective or practical to collect. This may result in the use of default data which has been derived based on certain assumptions/conditions and which will therefore have varying applicability in different situations. The second two categories are explored with the site personnel, based on their knowledge and experience of the processes. High risk process parameters or source data (i.e. those with a significant influence on the reported data, such as meters) are reviewed for these uncertainties.

Verification Protocol Table 5: Resolution of Corrective Action and Clarification Requests			
Report clarifications and corrective action requests	**Ref. to checklist question in tables 2/3**	**Summary of project owner response**	**Verification conclusion**
If the conclusions from the Verification are either a Corrective Action Request or a Clarification Request, these should be listed in this section.	Reference to the checklist question number in Tables 2, 3 and 4 where the Corrective Action Request or Clarification Request is explained.	The responses given by the Client or other project participants during the communications with the verification team should be summarized in this section.	This section should summarize the verification team's responses and final conclusions. The conclusions should also be included in Tables 2, 3 and 4, under "Final Conclusion".

Figure 1 Verification protocol tables

2.1 Review of Documents

The Monitoring Report (MR) submitted by Jalles Machado S.A. and additional background documents related to the project design and baseline, i.e. country Law, Project Design Document (PDD), Approved methodology AM0015, Kyoto Protocol, Clarifications on Verification Requirements to be Checked by a Designated Operational Entity were reviewed.

The verification findings presented in this report relate to the project as described in the PDD version 2 B.

2.2 Follow-up Interviews

On 27/06/2008 Bureau Veritas Certification performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of Jalles Machado S.A. were interviewed (see References). The main topics of the interviews are summarized in Table 1.

Table 1 Interview topics

Interviewed organization	Interview topics
JALLES MACHADO SA	Project Design and implementation Technical Equipment and operation Monitoring Plan Monitored data Data uncertainty and residual risks GHG Calculation Environmental Impacts Stakeholder Process Compliance with National Laws and regulations.

2.3 Resolution of Clarification, Corrective and Forward Action Requests

The objective of this phase of the verification is to raise the requests for corrective actions and clarification and any other outstanding issues that

needed to be clarified for Bureau Veritas Certification positive conclusion on the GHG emission reductions calculation.

Findings established during the initial verification can either be seen as a non-fulfilment of criteria ensuring the proper implementation of a project or where a risk to deliver high quality emission reductions is identified.

Corrective Action Requests (CAR) are issued, where:
i) there is a clear deviation concerning the implementation of the project as defined by the PDD;
ii) requirements set by the MP or qualifications in a verification opinion have not been met; or
iii) there is a risk that the project would not be able to deliver (high quality) CERs.

Forward Action Requests (FAR) are issued, where:
iv) the actual status requires a special focus on this item for the next consecutive verification, or
v) an adjustment of the MP is recommended.

The verification team may also use the term Clarification Request (CR), which would be where:
vi) additional information is needed to fully clarify an issue.

To guarantee the transparency of the verification process, the concerns raised are documented in more detail in the verification protocol in Appendix A.

3 VERIFICATION FINDINGS

In the following sections, the findings of the verification are stated. The verification findings for each verification subject are presented as follows:

1) The findings from the desk review of the original project activity documents and the findings from interviews during the follow up visit are summarized. A more detailed record of these findings can be found in the Verification Protocol in Appendix A.
2) The conclusions for verification subject are presented.

In the final verification report, the discussions and the conclusions that followed the preliminary verification report and possible corrective action requests should also be encapsulated in this section.

3.1 Remaining issues: CARs, FARs from previous verification

There are not any remaining issues, including CARs, CRs and FARs.

3.2 Project Implementation

Project has been implemented as defined in the PDD. The only change that has occurred in the major equipments is that only the 28 MW generator in in operation for the project. The two 5 MW generators are not anymore operating for the CDM project.

The plant uses bagasse as fuel, which is stored in an open yard close to the plant and covered with waterproof covers during the non crop-season and in raining and moisture seasons. The project boundaries are as defined in the PDD.

The plant 13.8 kV feeder is connected to a 69 kV transmission line, which has 2 sealed meters (one primary and another as a backup for the primary meter). These meters are installed in a restricted area at the substation.

The power purchase agreement states that the payment will be made according to the data monitored by the meter. In the event of the main meter failure, the measurement will be done by the backup meter. Every month a joint reading by Jalles Machado and CELG is done and the energy is invoiced based on this information.

3.3 Internal and External Data

As per the monitoring plan for calculating the CERs, the following data needs to be monitored.

i) Electricity supplied to the grid by the project.

ii) CO2 emission factor of the grid

iii) CO2 operating margin emission factor of the grid.

iv) CO2 build margin emission factor of the grid.

v) Fraction of time during which low-cost/must run sources are in the margin

The monthly readings of the energy supplied to the grid are made in calibrated meter equipment and recorded in electronic spreadsheets. Joint meter readings are taken along with CELG every month for the net power exports to the grid.

Jalles Machado has also its own measurement system which is used to compare the amount of energy determined by CELG's meters.

The external data used to calculate the emission reduction is only the energy exported to the grid.
The baseline grid electricity emission factor (EFy) is determined ex-post, in a conservative manner, assuming that at the registered PDD the recording frequency is at the validation and yearly after the registration.
In order to calculate the ex-post emission factor of the S-SE-CO grid, it was used the approved methodology AM00015, applied to the registered JMBCP.
The calculated emission factor for 2007 is 0.2628 tCO2e/MWh.
As there were not information available for the calculation of 2008 emission factor, it was considered the same one calculated for 2007.

Jalles Machado provided the version 1 of the 3rd monitoring report, of June 04, 2008, considering the period of 01 December, 2006 to 22 April, 2008.

No CARs, CRs nor FARs were identified.

Due to the request for review issued by the Executive Board on 13/08/2008 the project participants issued a new version of the monitoring report with the due explanation for the increase in the bagasse production during the monitoring period . Besides the project participants issued a response to the request for review with the same explanation and data of the sugar cane crushed and bagasse consumption during the credit period

The DOE could verify the above mentioned data and the conclusion is that they are correct. The DOE also agrees with the explanation presented by the PP for the increasing of the bagasse production. The official data about the production of sugar cane in the region where the project activity is located show that was an increase in the production compared with the previous years. Data available in the website http://www.unica.com.br/userFiles/estatisticas/produção%20centro-sul%203.xls

3.4 Environmental and Social Indicators

No environmental and social indicators are defined in the monitoring plan. The company has ISO 9001:2000 and ISO 14001:2004 certifications. It also develops projects aimed at the local environment protection, designed to protect local animal species, reforestation of native vegetation alongside rivers. Three times a year are done environmental programs with the community.

The company has all environmental licenses and water-impounding permits. They have been checked and are valid. All the technical conditions of the environmental licenses are fulfilled.

In the social area, the company offers school for employees' sons and drugstore offering wholesale-priced medication.

3.5 Management and Operational System

3.5.1 Discussion

Procedure RO-09-IND/044-1 provides routines to be followed in case of unexpected problems with data access and/or data quality, measurement and record of the energy dispatched to the grid, calculation of the emission reductions and issuance of the monitoring report.

The monitoring report presents the calculations for the amount of emission reductions based on the approved baseline methodology, which defines that the calculation shall be done multiplying the net electricity exported to the grid times the ex-post carbon emission factor, as defined in the PDD.

Routines for the archiving of the data are being followed as a regular practice.

No CDM specific internal audits are required.

No CARs, CRs nor FARs were identified.

4 THIRD PERIODIC VERIFICATION FINDINGS

4.1 Completeness of Monitoring

Monitoring report presents all the information required to estimate the emission reduction. There were no evidences that this information is incomplete.

4.2 Accuracy of Emission Reduction Calculations

The calculation of emission reductions is correct in accordance to the approved methodology.

4.3 Quality Evidence to Determine Emissions Reductions

The critical parameters used for the determination of the Emission Reductions are:

- Electricity supplied to the grid by the project;
- CO_2 emission factor of the grid;
- CO_2 operating margin emission factor of the grid;
- CO_2 build margin emission factor of the grid.

The project participants submitted to Bureau Veritas Certification the version 1 of the 3rd Monitoring Report of "Jalles Machado Bagasse Cogeneration Project - JMBCP" (Registration number 0187). It was also provided spreadsheets with the calculation of the Emission Reductions and the CO2 emission factor of the grid for 2007. As there was no information available for the calculation of 2008 emission factor, it was used for that year the same one calculated for 2007.

The energy supplied to the grid by the project has been double checked with the sales receipts and with the electronic spreadsheets for all the months included in the 3rd monitoring report.

According to the PDD, the CO_2 emission factor, the CO_2 operating margin emission factor and the CO_2 build margin emission factor were calculated at the validation and yearly after registration (ex-post).

The above mentioned spread sheets are available upon request.

Based on the data observed during on site visit, Bureau Veritas Certification could evidence that there are no relevant CO2 emissions from fossil fuels combusted due to the project activity at the project site, as required by the applicable methodology AM 0015.

All the data are in compliance with the figures stated in the monitoring report.

No CARs, CRs nor FARs were identified.

4.4 Management System and Quality Assurance

Management System for the CDM Project is in place. The organization structure is in place, defining the authorities and responsibilities for the project.

Periodic review being a regular practice, ensures the quality assurance of the various procedures to operate the plant and to record the operational parameters.

The meters PR-0504A044-02 (tag number ME-2007-001) and PR-0504A045-02 (tag number ME-2007-002), installed in the substation were calibrated on October 09, 2007.

No CARs, CRs nor FARs were identified.

5 PROJECT SCORECARD

Risk Areas		Conclusions			Summary of findings and comments
		Baseline Emissions	Project Emissions	Calculated Emission Reductions	
Completeness	Source coverage/ boundary definition	✓	✓	✓	All relevant sources are covered by the monitoring plan and the boundaries of the project are defined correctly and transparently.
Accuracy	Physical Measurement and Analysis	✓	✓	✓	Meters used for measuring power dispatched to the grid are calibrated.
	Data calculations	✓	✓	✓	Emission reductions are calculated correctly.
	Data management & reporting	✓	✓	✓	Data Management system is in place.
Consistency	Changes in the project	✓	✓	✓	There are no changes in the project.

6 THIRD PERIODIC VERIFICATION STATEMENT

Bureau Veritas Certification has performed a verification of the Jalles Machado Bagasse Cogeneration Project (JMBCP) (CDM Registration Reference Number 0187). The verification is based on the currently valid documentation of the United Nations Framework Convention on the Climate Change (UNFCCC).

The management of Jalles Machado S.A is responsible for the preparation of the GHG emissions data and the reported GHG emission reductions of the project on the basis set out within the project Monitoring and Verification Plan, indicated in the final PDD version 2 B. The development and maintenance of records and reporting procedures is in accordance with that plan, including the calculation and determination of GHG emission reductions from the project, which is a responsibility of the management of the project.

Bureau Veritas Certification confirms that the project is implemented as planned and described in validated and registered project design documents. Installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately. The monitoring system is in place and the project is ready to generate GHG emission reductions.

Bureau Veritas Certification can confirm that the GHG emission reductions are calculated without material misstatements. Our opinion relates to the project's GHG emissions and resulting GHG emission reductions reported and related to the valid and registered project baseline and monitoring, and its associated documents. Based on the information we have seen and evaluated we confirm the following statement:

Reporting period: From 01/12/2006 to 22/04/2008.

Baseline emissions:	14,975	t CO2 equivalents.
Project emissions:	0	t CO2 equivalents.
Emission Reductions	14,975	t CO2 equivalents.

26 August 2008

Antonio Daraya
Team Leader

26 August 2008

Sergio Carvalho
Internal Reviewer

7 REFERENCES

Category 1 Documents:

Documents provided by Usina Jalles Machado S.A, related directly to the project.

/1/ Jalles Machado Bagasse Cogeneration Project (JMBCP) – Project Design Document, version 2 B, of December 05, 2005.

/2/ Third Monitoring Report – Jalles Machado Bagasse Cogeneration Project, version 1, of June 04, 2008. version 2, of July 01,2008 and version 3 of August 25,2008

/3/ Econergy: Spreadsheet for Calculation of the Emission Reductions.

/4/ Econergy: Spreadsheet for the Calculation of the C02 emission Factor

/5/ Jalles Machado Suggar crushing report 2006,2007,2008

Category 2 Documents:

Background documents related to the design and/or methodologies employed in the design or other reference documents.

/1/ Aproved baseline Methodology AM 0015: Bagasse-based cogeneration connected to an electricity grid, version 1, of 22 September 2004.

/2/ Tool for the Demonstration and assessment of Addionality, version 02, of 28 November 2005.

/3/ Environmental Licenses issued by AGMA (Environmental State of Goiás Agency).

/4/ Water-impounding permits.

/5/ Calibration Cerificates for the two sealed meters.

/6/ Procedure RO-09-IND/044-I, revision 00 – Monitoring of Credit Carbon – Jalles Machado.

Persons interviewed:

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

/1/	Ivan Cesar Zanatta	Jalles Machado SA
/2/	Gilson Hideo Seii	Jalles Machado SA
/3/	Francisco Santo	Econergy Brasil Ltda.

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APPENDIX A: JALLES MACHADO BAGASSE COGENERATION PROJECT (JMBCP) CDM PROJECT VERIFICATION PROTOCOL

1. Initial Verification Protocol Table 1

OBJECTIVE	Ref.	COMMENTS	Conclusion (incl FARs/CARs)
A. Opening Session			
A.1. **Introduction to audits**		The audit purpose and methodology was briefed in the opening meeting, with the participation of the following persons: Antonio Daraya — Bureau Veritas Certification. Ivan Cesar Zanatta — Jalles Machado SA Gilson Hideo Seii — Jalles Machado SA Francisco Santo — Econergy Brasil	OK
A.2. **Clarification of access to data archives, records, plans, drawings etc.**		Complete access for relevant data, archives, records, plans, drawings was provided to the verification team	OK
A.3. **Missing steps to final approval**		According to the validation report the verification team	OK

OBJECTIVE	Ref.	COMMENTS	Conclusion (incl FARs/CARs)
		identified no missing steps. The project has been registered under the CDM by March 3, 2006 under the reference number 0187.	
B. Implementation of the project This part is covering the essential checks during the on-site inspection at the project's site, which is indispensably for an initial verification			
B.1. **Calibration and quality assurance** Check how monitoring and metering systems are subject to calibration and quality assurance routines a) with installation b) during future operation		Meters PR-0504A044-02 (tag number ME-2007-001) and PR-0504A045-02 (tag number ME-2007-002), installed in the substation, were calibrated on October 09, 2007. Next calibration is schedulled for October 2009.	OK
B.2. **Reporting procedures** Check how reports with relevance for the later determination of emission reductions will be generated		Jalles Machado developed and implemented the procedure RO-09-IND/044-I, revision 00 - Monitoring of Credit Carbon, with all activities related to emission reductions.	OK
B.3. **Responsibilities** Check whether all tasks required to gather data and prepare a monitoring		Procedure RO-09-IND/044, revision 00, defines the authorities and responsibilities to gather the data and to prepare the monitoring report.	OK

OBJECTIVE	Ref.	COMMENTS	Conclusion (incl FARs/CARs)
report with the necessary quality have been allocated to responsible employees.			
C. Internal Data 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.			
C.1. **Quality assurance** Does internal data collection underlie sufficient quality assurance routines?		The data of the supplied energy to CELG are sent to the commercial area to invoice. The quality assurance routines are developed according to the procedure RO-09-IND/044-1, revision 00	OK
D. External Data 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.			
D.1. **Type and sources of external data**		There is only one external data which is the monthly report from CELG, with the amount of energy imported.	OK

OBJECTIVE	Ref.	COMMENTS	Conclusion (incl FARs/CARs)
Acquire information on type and source of external data, which is used in calculations of emission reductions		These data are compared with internal data to invoice the energy exported. Data of the energy dispatched to the grid during the crediting period, issued by CELG, were provided by the project participants. The energy supplied to the grid by the project has been double checked with the sales receipts and with the electronic spreadsheets, for all the months included in the 3rd monitoring report.	
D.2. **Access to external data** How is data transferred? How can reproducibility of data set be ensured?		See D.1	OK
D.3. **Emergency procedures** Are there any procedures, which will be applicable if there is no access to relevant external data?		See D.1	OK
E. Environmental and Social Indicators A Monitoring Plan may comprise environmental and/or social indicators, which could be necessary to monitor for the success of the project activity.			
E.1. **Implementation of measures** A project activity may demand for the installation of measures (e.g. filtering		No environmental and social indicators are defined in the monitoring plan. Therefore the question is not applicable.	OK

OBJECTIVE	Ref.	COMMENTS	Conclusion (incl FARs/CARs)
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.		The company has some voluntary actions related to environmental and social issues, such as: • ISO 9001:2000 and ISO 14001:2004 certifications. • development of projects aimed at the local environment protection, designed to protect local animal species, reforestation of native vegetation alongside rivers, environmental programs with the community. • Offer of school for employees' sons and drugstore wholesale-priced medication. The company has all mandatory environmental licenses and water-impounding permits. The technical conditions of environmental licenses were fulfilled.	
F. Management and Operational System 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.			
F.1. **Documentation** The system should be documented by manuals and instructions for all procedures and routines with relevance		See D.1 above.	

OBJECTIVE	Ref.	COMMENTS	Conclusion (incl FARs/CARs)
to the quality of emission reductions. The accessibility of such documentations to persons working on the project has to be secured.			
F.2. **Qualification and training** 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.		All the personnel performing activities related to the operation and monitoring of the plant is dully qualified.	OK
F.3. **Allocation of responsibilities** The allocation of responsibilities should be documented in written manner.		Responsibilities are clearly defined in the procedure RO-09-IND/044-1, revision 00 - Monitoring of Carbon Credit.	OK
F.4. **Monitoring report** The system includes procedures for the calculation of emission reductions and the preparation of the monitoring report.		Procedure RO-09-IND/044-1, revision 00 - Monitoring of Carbon Credit, defines all the activities related to the calculation of emission reductions. The monitoring report presents the calculations of the emission reduction. The registered PDD defines that the calculation of the amount of emission reductions shall be done multiplying the net electricity dispatched to the grid times the ex-post carbon emission factor.	OK

OBJECTIVE	Ref.	COMMENTS	Conclusion (incl FARs/CARs)
F.5. **Internal audits and management review** The system includes internal control procedures, which allow the identification and solution of problems at an early stage.		The internal audit for CDM has not been planned but it is being performed once every six months, due to a requirement of ISO 9001:2000 and ISO 14001:2004 certifications.	OK

2. Periodic Verification Checklist Protocol

Table 2: Data Management System/Controls

The project operator's data management system/controls are assessed to identify reporting risks and to assess the data management system's/control's ability to mitigate reporting risks. The GHG data management system/controls are assessed against the expectations detailed in the table. A score is assigned as follows:

- Full - all best-practice expectations are implemented.
- Partial - a proportion of the best practice expectations is implemented
- Limited - this should be given if little or none of the system component is in place.

Expectations for GHG data management system/controls	Score	Verifiers Comments (Including Forward Action Requests)
G. Defined organisational structure, responsibilities and competencies		
G.1. **Position and roles** Position and role of each person in the GHG data management process is clearly defined and implemented, from raw data generation to submission of the final data. Accountability of senior management must also be demonstrated.	Full	The overall responsibility of the project is with the General Manager. The Integrated ISO 9001:2000/ISO 14001:2004 Management System Manager and the Electrical Engineer assist the General Manager for the day-to-day activities of the project.

Expectations for GHG data management system/controls	Score	Verifiers Comments (Including Forward Action Requests)
G.2. **Responsibilities** Specific monitoring and reporting tasks and responsibilities are included in job descriptions or special instructions for employees.	Full	The overall responsibility of the project is with the General Manager. The Integrated ISO 9001:2000/ISO 14001:2004 Management System Manager and the Electrical Engineer assist the General Manager for the day-to-day activities of the project. Procedure RO-09-IND/044-I - Monitoring of Carbon Credit defines all the responsibilities related to the monitoring of the project activity
G.3. **Competencies needed** Competencies needed for each aspect of the GHG determination process are analysed. Personnel competencies are assessed and training programme implemented as required.	Full	The procedure for training of monitoring personnel is documented. The training records have been submitted to the audit team for verification.
H. Conformance with monitoring plan		

Expectations for GHG data management system/controls	Score	Verifiers Comments (Including Forward Action Requests)
H.1. **Reporting procedures** Reporting procedures should reflect the monitoring plan content. Where deviations from the monitoring plan occur, the impact of this on the data is estimated and the reasons justified.	Full	The monitoring report was developed by ECONERGY, who calculated the emission reductions considering the monitoring plan indicated in the PDD and the data supplied by Jalles Machado. All the activities of the monitoring report related to emission reductions are conducted in accordance with the procedure RO-09-IND/044-I, Monitoring of Carbon Credit.
H.2. **Necessary Changes** Necessary changes to the monitoring plan are identified and changes are integrated in local procedures as necessary.	Full	Changes to the Monitoring plan are not required. Emission factor is calculated ex-post, according to the PDD.
I. Application of GHG determination methods		

Expectations for GHG data management system/controls	Score	Verifiers Comments (Including Forward Action Requests)
I.1. **Methods used** There are documented description of the methods used to determine GHG emissions and justification for the chosen methods. If applicable, procedures for capturing emissions from non-routine or exceptional events are in place and implemented.	Full	Data recorded as per the monitoring plan has been used for determining the emission reductions. Actual emission reductions are being determined using the formulae as given in the Section E.5 of the PDD. Every month a joint reading by Jalles Machado and CELG is done and the energy is invoiced based on this information. The electricity exported is multiplied with the ex-post calculated carbon emission factor to result in the actual emission reductions obtained.
I.2. **Information/process flow** An information/process flow diagram, describing the entire process from raw data to reported totals is developed.	Full	The procedure for recording the power exported to the grid has been indicated in the Power Purchase Agreement. The Monitoring report includes the monitoring of the power supplied to the grid.

Expectations for GHG data management system/controls	Score	Verifiers Comments (Including Forward Action Requests)
I.3. **Data transfer** Where data is transferred between or within systems/spreadsheets, the method of transfer (automatic/manual) is highlighted - automatic links/updates are implemented where possible. All assumptions and the references to original data sources are documented.	Full	The procedure for recording the power exported to the grid has been indicated in the Power Purchase Agreement. The metered data is recorded in paper. Subsequently this is manually transferred to electronic medium.
I.4. **Data trails** Requirements for documented data trails are defined and implemented and all documentation are physically available.	Full	The procedure for recording the power exported to the grid has been indicated in the Power Purchase Agreement.
J. Identification and maintenance of key process parameters		
J.1. **Identification of key parameters** The key physical process parameters that are critical for the determination of GHG emissions (e.g. meters, sampling methods) are identified.	Full	As described in the PDD, the critical parameter for determining the GHG emissions is the amount of electricity exported to the grid, that it is being measured through calibrated meters.

Expectations for GHG data management system/controls	Score	Verifiers Comments (Including Forward Action Requests)
J.2. **Calibration/maintenance** Appropriate calibration/maintenance requirements are determined.	Full	As per the Power Purchase Agreement CELG is doing the calibration and maintenance of the main and the backup meters. Procedure RO-09-IND/044-I defines the responsibilities of CELG and Jalles Machado related to calibration and maintenance of the sealed meters. The management of the measurement equipments is performed in accordance with the Jalles Machado procedure PG-11-I (Control of Equipments)
K. GHG Calculations		
K.1. **Use of estimates and default data** Where estimates or default data are used, these are validated and periodically evaluated to ensure their ongoing appropriateness and accuracy, particularly following changes to circumstances, equipment etc. The validation and periodic evaluation of this is documented.	Full	The default data used in the calculations of emission reductions is fixed during the validation stage. The current circumstances do not necessitate re-evaluation of these factors / constants.

Expectations for GHG data management system/controls	Score	Verifiers Comments (Including Forward Action Requests)
K.2. **Guidance on checks and reviews** Guidance is provided on when, where and how checks and reviews are to be carried out, and what evidence needs to be documented. This includes spot checks by a second person not performing the calculations over manual data transfers, changes in assumptions and the overall reliability of the calculation processes.	Full	There is no formal auditing procedure in place. However, the project personnel are aware about the accuracy requirements for the data and have procedures for independent review of the data.
K.3. **Internal verification** Internal verifications include the GHG data management systems, to ensure consistent application of calculation methods.	Full	The GHG data management system relies on the competence of the personnel associated. The internal verification was adequately evident. These are subject of the daily management of the project activity.
K.4. **Data protection measures** Data protection measures for databases/spreadsheets should be in place (access restrictions and editor rights).	Full	The key parameters are being measured and recorded in the respective documents /registers in paper form. The only electronic document that is necessary as per the PDD is the spreadsheet calculations for the emission reductions. Simple data protection measures such as more than one copy are evident and adequate.
K.5. **IT systems** IT systems used for GHG monitoring and reporting should be tested and documented.	Full	See K.4

Table 3: GHG calculation procedures and management control testing

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
The potential risks based on the emissions estimation procedures can be expected to occur in the following areas: i) Data collected for calculating the emission reductions involves recording the power exported to the grid. For the power exported to the grid, joint meter readings are taken with CELG through calibrated meters. ii) The period considered for emission reductions is based on the crop season. The records for monitoring the crop period needs to be properly identified and maintained for arriving at the actual emission reductions.	Regarding the potential reporting risks identified, the following mitigation measures have been observed during the review of documents and the verification visit to the site. i) The meters used for recording the power export to the grid are being periodically calibrated by CELG and as per the calibration reports, the meters are well within the accuracy level called for. ii) Records of the energy dispatched to the grid during the crop season are being archived properly. The procedures for monitoring the various data as required for the calculation of emission reductions are formalized in the procedure RO-09-IND/044-I. The authorities and responsibilities of various persons involved are defined.	Areas of residual risks are as follows: i) Calibration of the measuring meters.

Table 4: Detailed audit testing of residual risk areas and random testing

Areas of residual risks	Additional verification testing performed	Conclusions and Areas Requiring Improvement (including Forward Action Requests)
.From the Table 3, the areas of residual risk are as follows. i) Calibration of measuring meters used to determine the energy dispatched to the grid. .	The records pertaining to the calibration of measuring meters have been verified. The meters belong to CELG. Meters PR-0504A044-02 (tag number ME-2007-001) and PR-0504A045-02 (tag number ME-2007-002), installed in the substation, were calibrated on October 09, 2007. Next calibration is planned for October 2009.	For the next verification, the calibration status of the meters should be verified.

APPENDIX B – VERIFIERS CV´s

Bureau Veritas Certification Team Leader, Climate Change Verifier
Antonio Daraya – is graduated in Chemical Engineering with a very large experience in Industrial and Environmental management in several industrial fields. He is ISO 9001:2000, ISO 14001:2004 and OHSAS 18001:1999 Lead Auditor and has also experience in the implementation of Quality and Environmental Management Systems. Antonio is qualified as Lead Verifier GHG – Green House Gases.

Bureau Veritas Certification, Internal reviewer
Sergio Carvalho – is graduated in Physics with MsC in materials sciences. Has a big experience in the implementation of quality management systems in several industrial fields. He has been working for Bureau Veritas Certification for a long period developing certification schemes related to environment. Sergio is qualified as quality and environment lead auditor and as lead verifier GHG – Green House Gases.