

# VALIDATION REPORT

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**Zeroemissions do Brasil Ltda**

**São Fernando Biomass  
Cogeneration Project**

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**SGS Climate Change Programme**

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<b>Project Title:</b>			
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<b>Organisation:</b>		<b>Client:</b>	
SGS United Kingdom Limited		Zeroemissions do Brasil Ltda.	
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<b>Commenting Period:</b>		Published on 24 April 2009 until 23 May 2009	
First PDD Version and Date:		Version 01, dated 31 <sup>st</sup> March 2009	
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<b>Summary:</b>			
<p>Zeroemissions do Brasil Ltda. has commissioned SGS to perform the validation of the project: São Fernando Biomass Cogeneration Project.</p> <p>Methodology Used: ACM0006</p> <p>Version and Date: version 10 dated 12<sup>th</sup> February 2010</p> <p>The scope of the validation 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 applicable CDM requirements.</p> <p>The report is based on the assessment of the project design document undertaken through stakeholder consultations, application of standard auditing techniques including but not limited to document reviews, follow up actions (e.g site visit, telephone or e-mail interviews) and also the review of the applicable approved methodology and underlying formulae and calculations.</p> <p>The report and the annexed validation describes a total of twelve (12) findings which include:</p> <ul style="list-style-type: none"> <li>• 8 Corrective Action Requests (CARs);</li> <li>• 3 Clarification Requests (CLs);</li> <li>• 1 Forward Action Requests (FARs);</li> </ul> <p>The project will be recommended to the CDM Executive Board with a request for registration, assuming no new CDM requirements are published and applicable to the validation assessment of this project between issuance of this report and receipt of the Brazilian Letter of Approval.</p> <p>At time of issuance of the present validation report, no Letter of Approval (LoA) from the host country had been provided. The LoA will be issued once the Designated National Authority of Brazil receives and analyses the validation report.</p>			
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## Abbreviations

ANEEL	Brazilian Electricity Regulatory Agency (in Portuguese “Agência Nacional de Energia Elétrica”)
CAR	Corrective action request
CCEE	Commerce Chamber of Electric Energy
CDM	Clean development mechanism
CER	Certified emission reduction
CL	Clarification request
COP / MOP	Convention of the Parties / Meeting of the Parties
DOE	Designated operational entity
DNA	Designated national authority
EB	CDM Executive Board
ER	Emission Reduction
FAR	Forward action request
GHG	Greenhouse gas(es)
IPCC	Intergovernmental Panel on Climate Change
LoA	Letter of Approval
PDD	Project Design Document
PP	Project Participant
UNFCCC	United Nations Framework Convention on Climate Change

## Table of Content

1.	Validation Opinion.....	6
2.	Introduction.....	7
2.1	Objective.....	7
2.2	Scope.....	7
2.3	GHG Project Description.....	7
2.4	The Names and Roles of the Validation Team Members.....	7
3.	Methodology.....	7
3.1	Review of CDM-PDD and Additional Documentation.....	8
3.2	Use of the Validation Protocol.....	8
3.3	Findings.....	8
3.4	Internal Quality Control.....	9
4.	Validation Findings.....	10
4.1	Approval.....	10
4.2	Participation Requirements.....	10
4.3	Project Design Document including Project Description.....	10
4.4	Applicability of selected methodology to the project activity.....	11
4.5	Project Boundary.....	12
4.6	Baseline Selection and Additionality.....	12
4.7	Application of Baseline Methodology and Calculation of Emission Factors.....	19
4.8	Application of Monitoring Methodology and Monitoring Plan.....	23
4.9	Environmental Impacts.....	24
4.10	Local Stakeholder Comments.....	25
5.	Comments by Parties, Stakeholders and NGOs.....	26
5.1	Description of how and when the PDD was made publicly available.....	26
5.2	Compilation of all comments received.....	26
5.3	Explanation of how comments have been taken into account.....	26
6.	List of Persons Interviewed.....	27
7.	Document References.....	28

## Annexes:

A.1	Annex 1: Local Assessment.....	30
A.2	Annex 2: Validation Checklist.....	35
A.3	Annex 3: Overview of Findings.....	82
A.4	Annex 4: Team Members Statements of Competency.....	93

## 1. Validation Opinion

SGS United Kingdom Ltd has been contracted by Zeroemissions do Brasil Ltda. to perform a validation of the project: São Fernando Biomass Cogeneration Project in Brazil.

The validation was performed in accordance with the UNFCCC criteria for the Clean Development Mechanism (CDM), Validation and Verification Manual (VVM), version 1.2 and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The main purpose of the project activity is to increase the quantity of power generation using the sugarcane bagasse generated and to export the resulting extra power to the Brazilian grid, the National Interconnected System of Brazil (SIN).

The CDM project activity foresees the operation of a new sugarcane bagasse fired cogeneration unit at the sugar and ethanol mill Usina São Fernando, located in the municipality of Dourados, in the Brazilian state of Mato Grosso do Sul. The cogeneration unit will be built during the next five years and will achieve a top capacity generation of 128 MW, through the installation of three turbo-generators and two boilers, but due to the absence of more bagasse available for firing and the limitations on the capacity of the boilers for heat generation the project activity will only be able to achieve a maximum power capacity of 114 MW.

By the installation of three turbo-generators and two boilers for cogeneration, the project activity will result in reductions of greenhouse gas (GHG) emissions that are real, measurable and give long-term benefits to the mitigation of climate change.

In our opinion, the project meets all relevant UNFCCC, CDM criteria and all relevant host country criteria. The project correctly applies methodology ACM0006 version 10. It is demonstrated that the project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

The total emission reductions from the project are estimated to be 768,766 t of CO<sub>2</sub>e over a 7 year crediting period during 01/06/2011 to 31/05/2018, averaging 109,824 t of CO<sub>2</sub>e annually. The emission reduction forecast has been checked and it is deemed likely that the stated amount is achieved given the underlying assumptions do not change.

Once the Brazilian DNA issues the LoA, the project will hence be recommended by SGS for registration with the UNFCCC CDM EB, assuming no new CDM requirements are published and applicable to the validation assessment of this project between issuance of this report and receipt of the Brazilian Letter of Approval.

At the time of issuance of the present validation report, no Letter of Approval (LoA) from the host country had been provided. The LoA will be issued once the Designated National Authority of Brazil receives and analyses the validation report.

### Signed on Behalf of the Validation Body by Authorized Signatory



Signature:

Name: Siddharth Yadav

Date: 14<sup>th</sup> December 2010

## 2. Introduction

### 2.1 Objective

Zeroemissions do Brasil Ltda. has commissioned SGS to perform the validation of the project: São Fernando Biomass Cogeneration Project with regard to the relevant requirements for Clean Development Mechanism (CDM) project activities. The purpose of a validation is to have an independent third party assess the project design. In particular, the project's baseline, the monitoring plan (MP) and the project's compliance with relevant UNFCCC and host country criteria are validated in order to confirm that the project design as documented is sound and reasonable and meets the stated requirements and identified criteria. Validation is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reduction (CER). UNFCCC criteria refer to the Kyoto Protocol criteria and the CDM rules and modalities and related decisions by the COP/MOP and the CDM Executive Board.

### 2.2 Scope

The scope of the validation 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. SGS has employed a risk-based approach in the validation, focusing on the identification of significant risks for project implementation and the generation of CERs.

The validation is not meant to provide any consulting towards the Client. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project design.

### 2.3 GHG Project Description

The Report summarizes the results of the validation process of the project "São Fernando Biomass Cogeneration Project" performed on the basis of the UNFCCC criteria.

The CDM project activity foresees the operation of a new sugarcane bagasse fired cogeneration unit at the sugar and ethanol mill Usina São Fernando, located in the municipality of Dourados, in the Brazilian state of Mato Grosso do Sul. The cogeneration unit will be built during the next five years and will achieve a top capacity generation of 128 MW, through the installation of three turbo-generators and two boilers, but due to the absence of more bagasse available for firing and the limitations on the capacity of the boilers for heat generation the project activity will only be able to achieve a maximum power capacity of 114 MW. The main purpose of the project activity is to export the resulting extra power to the Brazilian grid, the National Interconnected System of Brazil (SIN) replacing partially the fossil fuel consumption.

### 2.4 The Names and Roles of the Validation Team Members

Assessment Team	Role
Fabian Goncalves	Lead Assessor
Lucas Engelbrecht	Local Assessor
Roberto Santos	Financial Expert
Sandeep Kurmi	Sectoral Expert Scope 1

Technical Review Team	Role
Liao Yi	Sectoral Expert Scope 1
Aurea Nardelli	Technical Reviewer

### 3. Methodology

#### 3.1 Review of CDM-PDD and Additional Documentation

The validation is performed primarily as a document review of the publicly available project document version 01 dated 31<sup>st</sup> March 2009 and the subsequent versions 02, 03 and final version 4 dated 21/09/2010. The assessment is performed by trained assessors using the validation checklist attached as Annex 2, table 2.

A site visit was carried out on 27<sup>th</sup> – 28<sup>th</sup> April 2009 by members of the assessment team. The project developers were interviewed by the assessment team to confirm and provide the evidence and documents, which are summarized in this report (Annex 1).

#### 3.2 Use of the Validation Protocol

The validation protocol used for the assessment is designed in accordance with the Validation and Verification Manual (VVM), version 1.2. It serves the following purposes:

- it organises, details and clarifies the requirements the project is expected to meet; and
- it documents both how a particular requirement has been validated and the result of the validation (reporting).

The validation protocol consists of several tables. The different columns in these tables are described below.

Checklist Question	Ref ID	Means of Verification (MoV)	Comment	Draft and/or Final Conclusion
The various requirements are linked to checklist questions the project should meet.	Lists any references and sources used in the validation process. Full details are provided in the table at the bottom of the checklist.	Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.	The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.	This is either acceptable based on evidence provided (Y), or a Corrective Action Request (CAR) due to non-compliance with the checklist question (See below). Clarification Request (CL) is used when the validation team has identified a need for further clarification.

The completed validation protocol for this project is attached as Annex A.1 to this report

#### 3.3 Findings

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

**A Clarification Request (CL)** is raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met

Where a non-conformance arises the Assessor shall raise a **Corrective Action Request (CAR)**.

A CAR is issued, where:

- The project participants have made mistakes that will influence the ability of the project activity to achieve real, measurable additional emission reductions;
- The CDM requirements have not been met;
- There is a risk that emission reductions cannot be monitored or calculated.

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



**A Forward Action Request (FAR)** is raised during validation to highlight issues related to project implementation that require review during the first verification of the project activity. FARs shall not relate to the CDM requirements for registration.

CARs and CLs are raised in the draft validation protocol and detailed in a separate form (Annex A.3). In this form, the Project Developer is given the opportunity to “close” outstanding CARs and respond to CLs and FARs.

### **3.4 Internal Quality Control**

Following the completion of the assessment process and a recommendation by the Assessment team, all documentation will be forwarded to a Technical Reviewer. The task of the Technical Reviewer is to check that all procedures have been followed and all conclusions are justified. The Technical Reviewer will either accept or reject the recommendation made by the assessment team. Findings can be raised at this stage and client must address them within agreed timeline.

## 4. Validation Findings

### 4.1 Approval

According to Resolution N° 1 (Ref.22) *“For the purposes of obtaining approval for project activities under the Clean Development Mechanism, project proponents shall submit to the Executive Secretariat of the Interministerial Commission on Global Climate Change, in electronic and printed format.... The project activity validation report prepared by the Designated Operational Entity authorized to operate in the country.... In Portuguese”.*

The LoA for Brazil is currently pending DNA approval process in accordance with Resolution N° 1 (Ref.22).

### 4.2 Participation Requirements

São Fernando Açúcar e Álcool Ltda. (Private Entity) and Zeroemissions do Brasil Ltda. (Private Entity) are the Brazilian entities responsible for the project, as mentioned in the section A.3 of the PDD.

Brazil is listed as the host Party. Brazil ratified the Kyoto Protocol on 23<sup>rd</sup> August 2002, ([http://unfccc.int/files/essential\\_background/kyoto\\_protocol/application/pdf/kpstats.pdf](http://unfccc.int/files/essential_background/kyoto_protocol/application/pdf/kpstats.pdf)).

There is no Annex I Party involved at this time of the project activity.

### 4.3 Project Design Document including Project Description

The project title “São Fernando Biomass Cogeneration Project” clearly identifies the project as a unique CDM Activity and that the PDD version 01 (Ref..1a) was completed on 31<sup>st</sup> March 2009 with a consistent timeline.

The project consists of a new sugarcane bagasse fired cogeneration unit at the São Fernando mill. The total installed capacity generation is 128MW. The technology of the project will use biomass as fuel in a high pressure boiler and high pressure steam will be generated and expanded in the back pressure turbine, generation power and steam.

It is expected that the project activity will help Brazil to fulfil its goals of promoting sustainable development. The contributions of the project activity for this were described in the PDD (Ref..1a), and comprises, among others: environmental benefits (reducing fossil fuel generation and project developed by the environmental program of the company); social and economical benefits.

The project is being implemented and has received the appropriate license for the project activity (Ref.13a-c, Ref.15). From the energy plan (Ref.5) it is possible to verify that the energy generation will increase in the next 5 years, as described in the PDD (Ref.1a).

The Party involved in the project activity is Brazil which ratified the Kyoto Protocol on 23/08/2002 and so far no Annex 1 Party is participating in the project activity.

The Project Participants are São Fernando Álcool e Açúcar Ltda. And Zeroemissions do Brasil Ltda. All project participants are private entities and did not receive any public funding.

The project category is correctly identified sectoral scope 1: Energy Industries (Renewable Source).

**CAR#06** was raised because the seconds of the geographical coordinates presented in the PDD (version 1) (Ref.1a) were not according to the document provided during the site visit (ANEEL technical spreadsheet) (Ref.13c), which stated the following: Latitude: 22° 18' 53" S / Longitude: 54° 55' 57" W.

To close out **CAR#06** the PP revised the PDD (version 2) (Ref.1b) and applied the geographical coordinates stated in the Reference 13c.

The revised documentation (Ref.1b; Ref. 13c) was verified by the assessment team and cross-checked through the website [www.rdtec.com.br](http://www.rdtec.com.br) to assure the accuracy of data. **CAR#06** was closed out (refer to Annex A.3 of this report).

The technologies to be applied by the project activity follows the common technology of its sector, the steam-Rankine cycle, and are not likely to be substituted (Ref.8; Ref.14).

#### **4.4 Applicability of selected methodology to the project activity**

The methodology applied in the project activity is the ACM0006 v.10: "Consolidated baseline methodology for grid-connected electricity generation from biomass residues in power and heat plants" (Ref.2) and the project activity complies with the methodology applicability criteria which is under the following conditions:

*No other biomass types than biomass residues, as defined in the Methodology ACM0006 version 10, are used in the project plant and these biomass residues are the predominant fuel used in the project plant (some fossil fuels may be co-fired);*

The PP stated that the unique fuel used in the project plant is a biomass residue consisting of sugarcane bagasse. The bagasse used in the São Fernando Cogeneration Plant comes from the production of alcohol and sugar carried in the same facility where the project is located.

Verified the boiler technical sheet (Ref. 14b) that the equipment is projected to operate using sugar cane bagasse as fuel and the estimative of the amount of bagasse generated by the facility during its crop seasons of operation (Ref. 16, Ref.18b) are according to the amount necessary to generate the electricity.

*For projects that use biomass residues from a production process (e.g. production of sugar or wood panel boards), the implementation of the project shall not result in an increase of the processing capacity of raw input (e.g. sugar, rice, logs, etc.) or in other substantial changes (e.g. product change) in this process;*

The PP states that the sugar and ethanol plant will not increase their current sugarcane processing capacity because of the CDM project, but rather due to the recent increase the production and the demand for sugar and ethanol. Second CONAB (reliable publication source in the sector), the sugarcane production in the Brazilian Central-South region in 2008 will reach the 502 million tones, which means an increase of 15.34% compared with 2007 (Ref.23).

The assessment team confirmed the statement above through the references provided by the PP (Ref.23) and through the publication of the Bioenergy Producers Union (UDOP) website, which forecasts the alcohol production will increase 122% from 2008/09 to 2017/18 (<http://www.udop.com.br/index.php?cod=1058349&item=noticias>).

*The biomass residues used by the project facility should not be stored for more than a year.*

The PP stated that the percentage of the bagasse used per year in the cogeneration plant is almost the total production of bagasse and it is stored from the end of the harvest season, approximately in November, until the beginning of the following harvest season, approximately in April, which means for less than a year.

The assessment team was informed through interviews that the bagasse will not be stored for more than one year. The PP will store some bagasse from one crop season to another for a period of approximately 4-5 months to start up the boilers.

*No significant energy quantities, except from transportation or mechanical treatment of the biomass residues, are required to prepare the biomass residues for fuel combustion, i.e. projects that process the biomass residues prior to combustion (e.g. esterification of waste oils).*

The biomass residue for fuel combustion, the bagasse of sugarcane, is a (by-) product of a mechanical operation after sugarcane's reception and there is no transportation of the bagasse.

During the site visit, it was possible to observe that the São Fernando mill will produce bagasse internally which will be transported to its cogeneration facility through electrical and/or mechanical conveyor belts which will operate using electricity and/or steam generated in the biomass residue cogeneration facility, hence there will not be fossil fuel consumption within the project boundary or fossil fuel consumption attributable to the project activity.

Considering that the project complies with all conditions above, the validation team concluded that the selected methodology is applicable to the proposed CDM project activity

#### 4.5 Project Boundary

The description of the sources and gases included in the baseline and project activity are in accordance with the requirements of the methodology. There will be no unexpected emissions resulting from the project activity. A diagram indicating the physical delineation of the project activity with its equipments, flow of mass and energy was included in the PDD.

The main source in the baseline scenario is the CO<sub>2</sub> emission from the grid electricity generation. The Brazilian interconnected grid is applicable to the project activity and its emission factor is calculated by the Brazilian DNA. Information is publicly available at: [www.mct.gov.br/index.php/content/view/74689.html](http://www.mct.gov.br/index.php/content/view/74689.html).

#### 4.6 Baseline Selection and Additionality

**CAR#11** was raised to address that according to the Combined Tool, in cases where one or more alternatives are not available options to project participants, a different procedure than the one provided in the tool would be required to demonstrate additionality and identify the baseline scenario. In this case the proposed project activity includes grid-connected power projects (where an alternative might be electricity produced by other facilities not under the control of the project participants). The project participants can continue to use, if desired, the additionality tool, and provide their own methods to develop and/or assess baseline scenario.

The following information was provided in the PDD (version 2) (Ref.1b): *“One of the alternative scenarios to the project activity is the construction of a new cogeneration plant with less efficient equipments. This plant, with the same installed capacity, would fire the same type and quantity of biomass residues as in the project plant, but with a lower power generation. In this case, the difference between the power generated by the project plant and the power generated by the less efficient plant would be generated by other facilities that are currently connected to the grid and are not under the control of the project participants.”*

Considering the possible scenario the project are able to use the “Tool for the demonstration and assessment of additionality” if supported by an approved request for deviation.

According to the Combined tool, foot note 1: *“The Meth Panel is considering whether expanding this tool to cover all cases would be appropriate. In the meantime, methodologies that typically involve alternatives are not under the control of project participants can continue to use, if desired, the additionality tool (provides benchmark and other tools), and provide their own methods to develop and/or assess baseline scenario.”* And as per the AM CLA 0120: to apply the Additionality tool the PP needs to provide their own approach to assess the baseline scenario supported by a deviation.

To close out **CAR#11**, the PP decided to not apply for a deviation but to follow exactly the Combined tool in the PDD version 3 (ref. 1c). The PDD version 3 (ref. 1c) was revised accordingly and CAR #11 was closed out..

According to the methodology requirements, the “combined tool” for the demonstration of the baseline and additionality the following steps and criteria are used to determine the baseline scenario:

1. Define plausible, realistic project options consistent with the country laws and regulations.
2. Discard the project options that face financial and/or other barriers that make the scenarios identified in 1 not feasible and or less likely.
3. Discard project options that do not correspond to the business as usual practice.
4. Select the most conservative project alternative from the still standing project alternatives.

The analysis of the scenario and discussion of additionality of the current project activity were carried out considering the steps above.

One of the alternative scenarios to the project activity is the construction of a new cogeneration plant with less efficient equipments. This plant, with the same installed capacity, would fire the same type and quantity of biomass residues as in the project plant, but with a lower power generation. In this case, the difference between the power generated by the project plant and the power generated by the less efficient plant would be generated by other facilities that are currently connected to the grid.

The project applied correctly the methodology and the Combined Tool. The identification of the baseline scenario follows the requirements of the methodology ACM0006, version 10 (Ref.2).

For **power** generation, the alternatives P4 and P5 are considered realistic and credible (In absence of the project activity, a reference plant would be built with a less efficient technology for power generation. The reference plant would fire the same type and quantity of biomass residues as the project plant, but with a lower efficiency of power generation. Therefore, the difference of power generation between the project plant and the reference plant would be taken from the grid);

For **heat** generation, the alternative H2 is considered realistic and credible (In absence of the project activity, the same heat would be generated by the reference plant, which would use the same type and quantity of biomass residues);

For the use of **biomass**, the alternative B4 is considered realistic and credible (The reference plant that would be built in absence of the project activity would fire the same type and quantity of biomass residues as in the project plant).

In conclusion, the scenario #4 of the methodology is identified correctly as the baseline scenario:

*The project activity involves the installation of a new biomass residue fired power plant at a site where no power was generated prior to the implementation of the project activity.*

*In the absence of the project activity, a new biomass residue fired power plant (in the following referred to as "reference plant") would be installed instead of the project activity at the same site and with the same thermal firing capacity but with a lower efficiency of electricity generation as the project plant (e.g. by using a low-pressure boiler instead of a high-pressure boiler).*

*The same type and quantity of biomass residues as in the project plant would be used in the reference plant (B4). Consequently, the power generated by the project plant would in the absence of the project activity be generated (a) in the reference plant (P5) and – since power generation is larger in the project plant than in the reference plant – (b) partly in power plants in the grid (P4).*

*In case of cogeneration projects, the following conditions apply: The reference plant would also be a cogeneration plant; the heat generated by the project plant would in the absence of the project activity be generated in the reference plant (H2).*

#### 4.6.1 Additionality

The demonstration of the additionality was done by the PP through the application of the:

- Baseline methodology approved and consolidated ACM0006 – version 10 (Ref.2): "*Consolidated baseline methodology for grid-connected electricity generation from biomass residues in power and heat plants*".
- "*Combined tool to identify the baseline scenario and demonstrate additionality*"; version 2.2 (Ref.2a).

The application of the methodology and tool cited above were cross-checked with the information described in the PDD version 03 (Ref.1c) and the documentation provided is authentic. See further discussion in the section 4.6.3.

#### 4.6.2 Prior Consideration of the Clean Development Mechanism

The project starting date is according to the required by EB 41. The starting date of 12/11/2007 corresponds to the date of the purchase of the first turbine (Ref.8a).

**CAR#03** was raised to address that the CDM consideration should be presented according to EB 41, annex 49, EB 48, Annex 61 and EB49 Annex 22. With the information provided in the PDD version 1 it was not possible to confirm that real actions were taken to implement the project activity considering the CDM.

To close the finding, additional information was added in the revised PDD and evidence was provided by the PP. The assessment team verified the documents related to the CDM consideration and project chronology:

- 31/01/2007: Minute of Meeting of the Grupo Bertin which discussed the possibilities of the carbon credits benefits for the São Fernando project located in Dourados (Ref.12d).
- 06/09/2007: Minutes of the Grupo Bertin's Board meeting specific for the São Fernando mill (Ref.12a), considering the project is developed under CDM and the pending of to find a consultant for the CDM project.
- October 2007: First proposal from ZeroEmissions to São Fernando project (Ref.12b).
- 12/11/2007: Starting date of the project activity (Ref. 8a), date of purchase of the first turbine;
- March 2008: Revised proposal from ZeroEmissions to Sao Fernando project (Ref.12bi).
- August 2008: Revised proposal from ZeroEmissions to Sao Fernando project (Ref.12bii).
- 26/11/2008: Contract between ZeroEmissions and Usina São Fernando Açúcar e Álcool Ltda (Ref.12c).
- 05/02/2009 and 13/04/2009: proposals from SGS
- 13/04/2009: Signed contract with the DOE SGS
- 24/04/2009: PDD published for Global stakeholder consultation

Through the evidences provided by the PP, the assessment team concluded that the CDM consideration was presented according to EB 48 Annex 61 and the **CAR#03** was closed out. The CDM consideration is also in accordance with the most recent guidance issued on EB49 Annex 22.

#### 4.6.3 Identification of alternatives

The Combined Tool, version 2.2 (Ref. 2a) is correctly applied in the PDD version 3 (Ref. 1c) and it is discussed below the Step 1: Identification of alternative scenarios.

In the **Sub-step 1a: Define alternatives to the proposed CDM project activity** of the "Combined tool to identify the baseline scenario and demonstrate additionality", version 02.2, the following alternatives were presented in the PDD as available to the project activity:

- the project activity not undertaking as a CDM project activity; as the project participants have obtained the necessary licences for the construction and operation of the project plant, but the construction of the project plant without considering the CDM revenues is not attractive and this is discussed in the additionality through barrier and investment analysis.
- the scenario #4 of the methodology ACM0006, version 10: the construction of a cogeneration plant, fired with the same type and quantity of biomass residues, but with a power generation efficiency (less efficient boilers and turbines). This plant would not have enough capacity for generating energy in order to cover its own needs and should import a part of energy from the grid. In this case the difference between the power generated by the project plant and the less efficient plant would be generated by other facilities that are connected to the grid and are not under control of the project participant.

In the **Sub-step 1b: Consistency with mandatory applicable laws and regulations**, the PP did not present information about how the requirements of mandatory laws in Brazil were checked and **CL#07** was raised to address this issue in the PDD version 01 (Ref.1a).

It was added to the revised PDD and information about how the requirements of mandatory laws in Brazil were checked. The PP provided the Construction License and the protocol of the Operating License of the project activity (Ref.15). Also, the Brazilian Electricity Energy Agency (ANEEL) authorized and established the PP as an independent power producer who can sell electricity to the interconnected grid (Ref.13a, b, c).

The **CL#07** was closed out based on the evidences mentioned above (refer to Annex A.3 for details).

So, the auditors concluded that the two alternatives presented in the PDD are correctly identified by the PP.



#### 4.6.4 Investment analysis

During the validation process of the São Fernando Project the auditors utilized the information presented by the client, which consist in an excel worksheet containing the calculation, the premises and all the information related to the investment analysis contained in the PDD. The auditors have performed financial analysis in order to conclude if such project is financially and economically feasible or unfeasible. Also, the auditors have analyzed if such project follows or not the Combined tool to identify the baseline scenario and demonstrate additionality and the Guidance on the Assessment of Investment Analysis.

The Combined tool to identify the baseline scenario and demonstrate additionality, version 2.2 is correctly applied in the PDD version 3 and it the required steps are discussed below:

##### Steps 3: Investment analysis

**Determine appropriate analysis method** of the “Combined tool to identify the baseline scenario and demonstrate additionality” (Ref.2a) version 02.2: the investment analysis method chosen by the PP was the, benchmark analysis.

**Benchmark analysis:** the financial indicator used is the project Internal Rate of Return (IRR). In the first version of the PDD the project IRR was compared with SELIC (Basic Interest Rate). **CL#01** was raised to address the PP that the SELIC from the last eight months (August 2008 – March 2009) was used for the comparison and the last value of 12.66% was adopted in the analysis. The period is not in accordance with the PDD chronology, which presents the proposed starting date of 12/11/2007. According to the Guidance on the Assessment of Investment Analysis the input values used in the investment analysis should be valid and applicable at the time of the investment decision taken by the project participant and not information available at an earlier or later point.

To close out **CL#01**, the PP calculated the Weight Average Cost of Capital – WACC used by the Group Bertin (15.82%) for the period of the starting date of the project activity) (ref. 11). **CL#01** was closed out.

WACC calculation and premises used:

<b>Assumptions (*)</b>	
Cost of Debt (July 2007)	15.70% (ref. 27)
D/(D+E)	50.00% (ref. 28)
Risk Free (Selic – July 2007)	11.50% <a href="http://www.bcb.gov.br/?COPOM128">www.bcb.gov.br/?COPOM128</a>
T-Bond (2007)	4.98% <a href="http://uk.finance.yahoo.com/q/hp?s=^TYX&amp;b=01&amp;a=06&amp;c=2007&amp;e=31&amp;d=06&amp;f=2007&amp;q=d">uk.finance.yahoo.com/q/hp?s=^TYX&amp;b=01&amp;a=06&amp;c=2007&amp;e=31&amp;d=06&amp;f=2007&amp;q=d</a>
Retorno Mercado – SP 500 (July 2007)	12.09% Historical Series – Yahoo Finance
Market Premium	7.11% (calculated: 12.09% - 4.98%)
Inflation (IPCA - 2007)	4.46% <a href="http://www.bcb.gov.br/Pec/metast/TabelaMetaseResultados.pdf">www.bcb.gov.br/Pec/metast/TabelaMetaseResultados.pdf</a>
IR/CSLL	34.00% (Income Tax and Social Contribution over net profits)
Betas (base: July 2007)	0.83 BETA AVERAGE (ref. 9 - Beta represents the systematic risk of the company, according to the characteristics of its sector. It indicates the relation between the return of an asset and the market return.)

<b>WACC Calculation</b>	
Levered Beta	1.38
Risk Free Tax	11.50%

Mkt Premium	7.11%
<b>Ke (R\$)</b>	<b>21.28%</b>
Cost of Debt	15.70%
IR/CS	34.00%
<b>Kd</b>	<b>10.36%</b>
E/(D+E)	50.00%
D/(D+E)	50.00%
<b>WACC</b>	<b>15.82%</b>

The appropriate analysis method utilized by the client was the “Benchmark Analysis”, where such analysis is based on the IRR (Internal Return Rate). The premises of the analysis was based on the electricity sales revenue, operating and maintenance costs, insurance, amortization of the equipments, re-investments based on depreciation, general administrative and financial expenditures. Also, the client has considered 20 years as a lifetime of the project which ranges from 2008 to 2028 /9/.

The investments were estimated in BRL 78,264 thousands during 2008, BRL 2,565 thousands in 2009 and BRL 62,613 thousands in 2012 and BRL 5,635 thousands in 2013 respectively totaling BRL 149,077 thousands (references 8a turbine purchase contract 12/11/2007, 10a BNDES contract 03/02/2009 which confirms the estimated data used at the time of the investment decision, 14a boiler contract 11/2007, 14c generator contract 18/09/2007). Such investments include the equipments (three turbo-generators and two boilers), among others. The operational costs were estimated in approximately 10.6% (in the average) of the net revenues and are composed mainly by labor and maintenance.

The company has already signed a 15 year Power Purchase Agreement (PPA) starting at 2010, with a fix price of 156 BRL/MWh (ref. 4a PPA between São Fernando and CCEE, CER 16/08, August 2008). The PPA of São Fernando plant has been signed with the Brazilian Government, through an energy public tender in August 2008, so there is no possibility of variation of the electricity price for the following 15 years. For the electricity price on 2009, since the company did not have any PPA in the moment of the financial analysis, it has been assumed a value of 120 BRL/MWh, which is the price of the proposal of purchase from the free market that the company has (Ref.4c). Both evidences provided as reference 4a and 4c discussed above were considered credible and besides it is dated after the investment decision, confirms that the estimated data used for the electricity tariff is correct and appropriate.

In 2007 Procknor carried out a study following the plan of the sugar cane availability carried out by USF (ref. 5). In 2009, since the sugar cane was available earlier than expected, Sao Fernando decided to accelerate the implementation of the project. It is currently anticipated that Sao Fernando reaches full capacity in 2013 while in 2007 envisaged that reached maximum capacity in 2017. The decision of accelerating the plantation and the implementation of the project was taken due the surface for plantation has been able to be planted before they expected (email dated 23/08/2010 from Paulo Cesar – Usina São Fernando to Javier Becerra - Zeroemissions).

The Financial Analysis presented in the PDD was that carried out at the time of decision making, thus in 2007. In 2007 the project participant planned the plantation according to the expected availability of the area for the sugar cane plantation. The financial analysis was carried out according to this area availability and according to the results of the study of Procknor Engenharia Ltda. In 2009, since the land was available, Sao Fernando decided to accelerate the process of planting and thus the implementation of the project. The change in the project chronology has impact on the investment analysis. With this, Sao Fernando can anticipate the revenues from electricity sales and also they need to anticipate the investments and the increase on the operational costs, so the IRR of the project remains approximately the same. An investment analysis considering the anticipation of the investments and the revenues has been provided in order to ensure the project additionality. The anticipated IRR results in 10.21% while the 2007-IRR resulted in 10.63%.



**Sensitivity analysis:** the sensitivity analysis presented in PDD version 1 did not follow the requirements of the Combined Tool. The initial investment cost that constitute more than 20% of total project cost and energy that represents the main revenue were not analyzed. With the result of the sensitivity analysis it is not possible to conclude that project is not financially attractive since in some items the IRR pass the project IRR. The **CAR#02** was raised.

After considering, from the client inputs, the IRR – Internal Rate of Return is approximately 10.63% reaching the NPV – Net Present Value of about (BRL 35.9 million) – negative comparing to the benchmark rate of 15.82%. Even considering the CDM revenues the IRR of 14.15% is still below the benchmark. The financial analysis presented confirmed the necessity of CDM revenue to implement the proposed project. The PP explained that the extra revenues considering the CDM, makes the project return increase, thus compensating the risks with the project activity.

PARAMETER	VARIATION	IRR
Investments in PP&E	-10%	12.20%
	0	10.63%
	+10%	9.24%
Operation Costs	-10%	11.00%
	0	10.63%
	+10%	10.26%
General & Administrative Expenses	-10%	10.86%
	0	10.63%
	+10%	10.40%
Energy Output	-10%	8.27%
	0	10.63%
	+10%	12.79%

The sensitivity analysis has been made by altering the parameters that are considered as likely to fluctuate over time. These are the following ones: Investments in Power Plant and Equipments, Operation Costs, General & Administrative Expenses, Energy Output (Ref.1b; 9). **CAR#02** was closed.

The electricity price was not included in the sensitivity analysis because the PP has already signed a 15 year Power Purchase Agreement (PPA) starting at 2010, with a fix price of 156 BRL/MWh (ref. 4a PPA between São Fernando and CCEE, CER 16/08, August 2008). The PPA of São Fernando plant has been signed with the Brazilian Government, through an energy public tender in August 2008, so there is no possibility of variation of the electricity price for the following 15 years.

The costs of the project activity were demonstrated by the PP through evidences:

Item	Value	Source
Investment (R\$000)	149,077	Ref.8a, 9, 10a, 14a, 14c
O & M Costs	Variable value	Ref. 6, 9,
Installed Capacity (MW)	From 48MW to 128MW (top capacity)	Ref. 13a
Energy Tariff (R\$/MWh)	120.00 and 156.00	Ref. 4a, 4c
Taxes (%) - IR/CSSL	34	Ref. 29

The values of investment and operating cost used in the cash flow were cross-checked with the evidences provided by the PP as explained in the sections and tables above (Ref.4a, 4b, 4c, 4d, 5, 6, 7, 8a, 12c, 14a, 14c, 17b), which contains energy price proposals and auction results, estimative of production, insurance contract, turbines and boilers purchase contracts, among others). All references were checked and valid as

reference data used in the investment analysis and latter evidence provided supports and confirms the estimative and data provided at the time of the investment decision.

The financial analysis shows that the IRR of 10.63% of the project activity without CER revenues is lower than the benchmark - WACC of 15.82%. Based on the financial analysis presented the auditors can conclude that the proposed project activity without the CDM incentive is not attractive as a financial investment. The inclusion of the CER revenues increases the IRR, compensating the risks that the PP takes with the project activity.

Taking into account the above items and the fact the PP applied the "Combined tool to identify the baseline scenario and demonstrate additionality"; version 02.2, the assessment team concludes the project is not the most attractive alternative, without CERs revenues.

#### 4.6.5 Barrier analysis

According to the Combined Tool, a "Barrier Analysis" is required (in Step 2) to assess the alternatives.

##### STEP 2: Barrier analysis

##### **Sub-step 2a: Identify barriers that would prevent the implementation of alternative scenarios**

The main barrier presented in the PDD to implement the project activity is the high investment that it requires. As an additional clarification and to confirm the barrier faced by the project at the time of the investment decision, the assessment team verified that according to the Chairman of the Brazilian National Sugarcane Association (UNICA, 13/08/2008, ref. 24), although energy generation from sugarcane bagasse in Brazil has a great potential, there are several issues that could prevent the implementation of this kind of projects, and also the proposed project São Fernando, such as:

- Issues related to the project location: depending on the location of the project and the geographical configuration of the grid, the cost of connexion is too high. The sugar / ethanol companies are responsible to undertake this expenditure.
- Investment and operating costs of energy cogeneration.
- Investment barrier: according to the Ministry of Agriculture, National Plan of Agroenergy 2006-2011 (ref. 25, page 72), investing in efficient equipments that generate extra electricity to export to the grid represents an important extra cost to the proposed project activity. The sugarcane industry prefers to invest in medium technologies that generate higher incomes and less expenditure in a short term. Usually the revenues of selling electricity from a cogeneration project represent a small part of the total revenues of a sugar mill. Thus sugar mills tend to invest in their core business, sugar an ethanol, instead of investing in electricity generation to the grid.

With this scenario only the alternative which is the project activity not undertaking as a CDM project is prevented because require investments. Only continuing with the business as usual scenario (scenario 4) does not require additional investment for the mill.

##### **Sub-step 2b: eliminate alternative scenarios which are prevented by the identified barriers**

Scenario/alternative	Barrier – investment	Comments
The project activity not undertaking as a CDM project activity	Prevent the proposed project	Require investment (assessed through investment analysis)
Scenario #4 of the methodology ACM0006	Does not prevent	Baseline scenario

According to the information verified by the assessment team the barrier identified prevent the alternative of the project activity not undertaking as a CDM project.

According to the Combined Tool (ref. 2a) if there is only one alternative scenario that is not prevented by any barrier, and if this alternative is not the proposed project activity undertaken without being registered as a CDM project activity, then this alternative scenario is identified as the baseline scenario. In the proposed project the alternative that is not prevented by the barrier is the scenario 4, identified as the baseline

scenario. Based on that the PP shall explain how the registration of the CDM project activity will alleviate the barrier that prevent the proposed project activity from occurring in the absence of the CDM.

Therefore, as the barrier mentioned above are directly related to investment in a cogeneration and entering into a new business of electricity sales, step 3 of the Combined Tool, investment analysis, was applied. According to the VVM version 1.2, para 116, issues that have a clear direct impact on the financial returns of the project activity cannot be considered barrier and shall be assessed by the investment analysis, as applied above (section 4.6.4) and in the PDD.

#### **4.6.6 Common practice analysis**

The Combined tool to identify the baseline scenario and demonstrate additionality, version 02.2, (ref. 2a) is correctly applied in the PDD version 3 and it will be discussed below the **STEP 4: Common practice analysis**.

**Analyze other activities similar to the proposed project activity:** in the PDD version 01(ref.1) there was no conclusion about the analysis related to the efficiency of the project activity, so the **CL#08** was raised.

The PP added in the section B.5 of the PDD, that the generation and exportation of electricity to the grid is recent in the sugar mill sector, legally allowed since 2000 and so the industries use low pressure, low efficiency units for self-supply.

According to ANEEL, the Brazilian installed capacity for electricity generation is 70% based on hydropower plants and only 3.53% ([www.aneel.gov.br/aplicacoes/capacidadebrasil/OperacaoCapacidadeBrasil.asp](http://www.aneel.gov.br/aplicacoes/capacidadebrasil/OperacaoCapacidadeBrasil.asp)) relies on sugarcane biomass. The share of fossil fuel is 8%, and the foreseeing is the increase to 18% until 2030 ([www.mme.gov.br/mme/menu/todas\\_publicacoes.html](http://www.mme.gov.br/mme/menu/todas_publicacoes.html)). The National Supply Company (CONAB) states in its 2008 Report (Ref.17a) that more than 89% of the energy produced by sugar and alcohol companies are for self-consumption and the efficiency of them are very low, mainly in the State of Mato Grosso do Sul (69.4KW/ton). The National Agroenergy Plan 2006-2011, developed by the Ministry of Agriculture, ([www.agricultura.gov.br/portal/page?\\_pageid=33,2864458&\\_dad=portal&\\_schema=portal](http://www.agricultura.gov.br/portal/page?_pageid=33,2864458&_dad=portal&_schema=portal)), foresees for 2020 a decreasing participation of the sugarcane bagasse cogeneration in the composition of the national grid and an increase of the gas generation.

**Discuss any similar Options that are occurring:** the PP discussed that a data from the Brazilian Ministry of Agriculture, there were currently:

- 413 registered sugarcane units registered in Brazil;
- 270 of them generate electricity.

According to the National Electricity Agency (ANEEL).

According to a recent sectoral report of the CONAB (Ref.17a) in cooperation with the Ministry of Agriculture, none of the sugar and alcohol production plants located in the state of Mato Grosso do Sul currently exports electricity to the national grid and the efficiency of generation per ton of this state is the lowest among all other Brazilian states (69.4 KWh per ton of bagasse consumed, which means 2.68% efficiency, considering the NCV of the bagasse used in the project plant).

According to the project participants data, when São Fernando achieves its top generation capacity the plant will generate around 468 KWh per ton of bagasse consumed, which means 18.07% of efficiency.

The DOE did not identify any similar plant in the state of Mato Grosso do Sul, where the project is located, so the project activity is not a common practice in the region.

After the addition, in the section B.5 of the revised PDD of the information summarized above it was cross-checked with the sources of data and the **CL#08** was closed out.

#### **4.7 Application of Baseline Methodology and Calculation of Emission Factors**

#### 4.7.1 Application of the Baseline Methodology

##### Baseline Emission

Based in the methodology applied, page 48, the baseline emissions due to uncontrolled burning or decay of the biomass residues are zero ( $BE_{\text{biomass},y} = 0$ ), since the biomass residues would not decay or be burnt in the absence of the project activity.

##### Project Emission

The formulae to calculate the project emissions is expressed below:

$$PE_y = PET_y + PEFF_y + PE_{EC,y} + GWP_{CH_4} \cdot (PE_{\text{BiomassCH}_4,y} + PE_{\text{wwCH}_4,y})$$

$PET_y$  = CO<sub>2</sub> emissions during the year  $y$  due to transport of the biomass residues to the project plant (tCO<sub>2</sub>/yr).

$PEFF_y$  = CO<sub>2</sub> emissions during the year  $y$  due to fossil fuels co-fired by the generation facility or other fossil fuel consumption at the project site that is attributable to the project activity (tCO<sub>2</sub>/yr).

$PE_{EC,y}$  = CO<sub>2</sub> emissions during the year  $y$  due to electricity consumption at the project site that is attributable to the project activity (tCO<sub>2</sub>/yr).

$GWP_{CH_4}$  = Global Warming Potential for methane valid for the relevant commitment period.

$PE_{\text{BiomassCH}_4,y}$  = CH<sub>4</sub> emissions from the combustion of biomass residues during the year  $y$  (tCH<sub>4</sub>/yr).

$PE_{\text{wwCH}_4,y}$  = CH<sub>4</sub> emissions from wastewater generated from the treatment of biomass residues in year  $y$  (tCH<sub>4</sub>/yr).

It was verified that there will be no emissions from:

- transportation of biomass residues ( $PET_y = 0$ ) (verified through Proknor report ref. 5, that the amount of biomass generated in the process is compatible with the amount of sugar cane produced. Biomass is a residue of the sugar mill production and is generated inside the mill, no transport, transformation or purchase is expected);
- electricity consumption of fossil fuels during the project activities ( $PEFF_y = 0$ );
- electricity demand of the projected plant will be satisfied with the bagasse electricity generation ( $PE_{EC,y} = 0$ );
- combustion of biomass residues ( $PE_{\text{BiomassCH}_4,y} = 0$ ); and
- wastewater generated from the treatment of biomass ( $PE_{\text{wwCH}_4,y} = 0$ ).

The desk review allowed the assessment team to conclude that project emissions are not applicable to the project activity.

##### Leakage Emission

Leakage is not applicable to the project activity because, as states in the methodology ACM0006 v.10 page 48, "the main potential leakage is an increase in emissions from fossil fuel combustion or other sources due to the diversion of biomass residues from other uses to the project plant as a result of the project activity" and this project activity does not combust fossil fuel and either apply biomass residues which would not be used for the same purpose.

##### Direct Calculation of Emission

$$ER_y = ER_{\text{heat},y} + ER_{\text{electricity},y} + BE_{\text{biomass},y} - PE_y - L_y$$

**ER<sub>y</sub>** = Emissions reductions of the project activity during the year *y* (tCO<sub>2</sub>/yr).

**ER<sub>electricity,y</sub>** = Emission reductions due to displacement of electricity during the year *y* (tCO<sub>2</sub>/yr).

**ER<sub>heat,y</sub>** = Emission reductions due to displacement of heat during the year *y* (tCO<sub>2</sub>/yr)

**BE<sub>biomass,y</sub>** = Baseline emissions due to natural decay or burning of anthropogenic sources of biomass residues during the year *y* (tCO<sub>2</sub>e/yr).

**PE<sub>y</sub>** = Project emissions during the year *y* (tCO<sub>2</sub>/yr).

**L<sub>y</sub>** = Leakage emissions during the year *y* (tCO<sub>2</sub>/yr).

**ER<sub>heat,y</sub>** = 0 (because the thermal efficiency in the project plant is similar compared with the thermal efficiency of the reference plant considered in the baseline scenario)

**BE<sub>biomass,y</sub>** = 0 (see section B.5.1)

**PE<sub>y</sub>** = 0 (see section B.5.2)

**L<sub>y</sub>** = 0 (see section B.5.3)

The reference plant is a cogeneration plant which consumes as much bagasse as the project plant for generating heat and electricity, as per requirements ACM0006 methodology requirements (scenario #4). Since the reference plant was expected to fulfill the energy needs from the sugar and ethanol production process at São Fernando mill, it would have been designed attend the production process heat requirements (as stated in the scenario #4 of the ACM0006).

With the available amount of bagasse and considering the heat requirements to be met, the reference plant would have been designed according to the regional standards and practices. The National Company for Supply, CONAB (Companhia Nacional de Abastecimento) published in April 2008 the "Sugar and Alcohol Sectoral Profile in Brazil". This report states the main characteristics of the Brazilian sugarcane processing sector, through the research in 343 sugarcane processing plants (with bagasse fired cogeneration units) located all around the country. According to this Profile, in the State of Mato Grosso do Sul, the cogeneration units which use bagasse as the energy source, generate, in average, 69.4 kWh of electricity per tone of bagasse (on wet basis). Project participants assumed this data as the most suitable for representing the situation occurred in absence of the project activity.

This figure considers only the electricity generated in these cogeneration plants. The usual efficiency of electricity generation from bagasse in cogeneration plants is 69.4 kWh/tonne of bagasse, in the State of Mato Grosso do Sul.

The reference plant generates, according to CONAB, 69.4 kWh of electricity per tone of bagasse by using a boiler with a determined efficiency. Implicit to this figure is considered the boiler average efficiency used in these type of plants in the State of Mato Grosso do Sul. These boilers make it possible to meet heating requirements by firing bagasse. Apart from this, the surplus energy is used to generate electricity in turbines and power generators. The whole plant, considering the specific heat requirements, the boiler efficiency, the turbine and generator efficiency and the net calorific value of bagasse, has a power generation efficiency of 69.4 kWh per tone of bagasse.

The project plant is designed to meet the heat requirements in the sugarcane mill. Considering these heat requirements, the boiler efficiency and the available amount of bagasse, the electricity generation potential (surplus after meeting heat requirements) is enough to install 128 MW installed capacity generation.

Reference plant characteristics are reflected in the efficiency of generation published by CONAB (ref. 17a). This efficiency, 69.4 kWh/tonne of bagasse, considers implicitly the boiler characteristics (including thermal characteristics), the bagasse consumption, the generation efficiency and the calorific value of bagasse in all the cogeneration plants included in the calculation.

The reference plant efficiency figure is calculated considering the specific heat requirements met in each case, the specific efficiency of the boilers, the specific efficiency of the turbine and the specific efficiency of the generator. Hence, it represents a combination of characteristics in the reference plant that results in an efficiency of generation, in terms of kWh per tone of bagasse, which is considered for the calculation of the.

So,  $ER_y = ER_{\text{electricity}, y}$

$$ER_{\text{electricity}, y} = EG_y \cdot EF_{\text{electricity}, y}$$

$EG_y$  = Net quantity of increased electricity generation as a result of the project activity (incremental to baseline generation) during the year  $y$  (MWh).

$EF_{\text{electricity}, y}$  = CO<sub>2</sub> emission factor for the electricity displaced due to the project activity during the year  $y$  (tCO<sub>2</sub>/MWh).

$$EG_y = EG_{\text{project plant}, y} - \varepsilon_{\text{el, other plant}(s)} \cdot \frac{1}{3.6} \sum BF_{k, y} NCV_k$$

$EG_{\text{project plant}, y}$  = Net quantity of electricity generated in the project plant during the year  $y$  (MWh).

$\varepsilon_{\text{el, other plant}(s)}$  = 2.68% (ref. 16, 17a, 18a) Average net energy efficiency of electricity generation in (the) other power plant(s) that would use the biomass residues fired in the project plant in the absence of the project activity (MWh<sub>el</sub>/MWh<sub>biomass</sub>).

$BF_{k, y}$  = Quantity of biomass residue type  $k$  combusted in the project plant during the year  $y$  (tons of dry matter or litre).

$NCV_k$  = Net calorific value of the biomass residue type  $k$  (GJ/ton of dry matter or GJ/litre).

Calculation of the emission factor of the grid for the electricity displaced due to the project activity ( $EF_{\text{grid}, CM, y}$ )

It is calculated using the methodological tool “*Tool to calculate the emission factor for an electricity system*”, in its most recent version. According to this tool, the PP correctly applied in the section B.6.1 of the PDD version 06 the following six steps for the baseline calculation:

STEP 1 – Identify the relevant electric power system.

STEP 2 – Select an operating margin (OM) method.

STEP 3 – Calculate the operating margin emission factor according to the selected method.

STEP 4 – Identify the cohort of power units to be included in the build margin (BM).

STEP 5 – Calculate the build margin emission factor.

STEP 6 – Calculate the combined margin (CM) emissions factor.

The Brazilian DNA made available the operating and the building margin emission factor calculated using option c – Dispatch data analysis OM. More information of the methods applied can be obtained in the DNA's website (<http://www.mct.gov.br/index.php/content/view/4016.html>) and vintage will be used in the project activity.

Hence, this data will be updated annually applying the number published by the Brazilian DNA. For estimative purposes, the data of the most recent year available in the DNA website was be used.

To calculate the emission factor of the interconnected Brazilian grid, STEP 6 above, the PP applied correctly the equation 4 below with its respective values. Where the weights  $w_{OM}$  and  $w_{BM}$ , by default, are 50% (i.e.,  $w_{OM} = w_{BM} = 0.5$ ).

The formulae and values applied were cross-checked by the assessment team and considered correct based on the methodology approach and DNA official data published for CDM activities purposes.

$$EF_{\text{grid}, CM, y} = EF_{\text{grid}, OM, y} \times w_{OM} + EF_{\text{grid}, BM, y} \times w_{BM}$$

$EF_{\text{grid}, BM, y}$  = Build margin CO<sub>2</sub> emission factor in year  $y$  (tCO<sub>2</sub>/MWh).



$EF_{grid,OM,y}$  = Operating margin CO<sub>2</sub> emission factor in year  $y$  (tCO<sub>2</sub>/MWh).

$W_{OM}$  = Weighting of operating margin emissions factor (%).

$W_{BM}$  = Weighting of build margin emissions factor (%).

#### 4.7.2 Ex-ante Data and Parameters Used

The only ex-ante parameter listed in the PDD is in compliance with methodology. The parameter is the “Average net energy efficiency of electricity in the reference plant that would be constructed in the absence of the project activity” and was correctly calculated based on a National Report about the Profile of the Alcohol Sector in the year 2008 (CONAB – National Company of Supply, from the Portuguese *Compahia Nacional de Abastecimento*) (Ref.17a) and the NCV determination procedure (Ref.18a).

Based on the evidences cited above (Ref.17a; 18a) the value of 2.68% was applied for the ex-parameter and the assessment team, after analysing the ex-ante parameter calculation (Ref.16), concluded that there will be no fixed data/parameter which will have influence in the ERs during the crediting period.

This project is a thermal power plant using biomass. The term “plant load factor” is not common in thermal plants (different from Hydro plants). The “load factor” in this case depends on the non availability of the plant like internal consumption and the project will monitor the net quantity of electricity generated during the year.

The assessment team has validated the Plant Load Factor (PLF) of the project activity through the Technical report prepared by the third party (engineering company) hired by the Project Proponent (Procknor, ref. 17b). The determination of PLF was a part of the engineering project report. The assessment team has validated the PLF for the biomass energy plant and found inline to the requirement set in EB48 Annex 11 for reporting and validation of PLF which allow the determination of PLF by a third party contracted by the project participants. It is very well evident from the evidence provided (ref. 5, 16, 17b) that the calculated PLF is specific and appropriate to the project activity.

#### 4.7.3 Calculation of Emission Reductions

The ER's are clearly calculated and expressed in the PDD version 01 (Ref.1a) following the scenario #4 of the ACM0006 v.10 and could be reproduced, as clearly demonstrated in the spreadsheet (Ref.16).

The data used to calculate the emissions was based on official (Ref.17a) or local data and the monitored parameters will replace them later for the Ers calculation.

In the PDD version 01 (Ref.1a), section B.6.2, the PP presented parameters used to calculate the emission factor ( $E_{fgrid}$ ) and they should be presented in the section B.7.1 of the PDD version 01 (Ref.1a), monitored parameters. **CAR#04** was raised.

As the parameters used to calculate the emission factor from the grid were excluded from the section B.6.2 and included in the section B.7.1 of the PDD version 02 (Ref.1b). Also the source of the  $EF_{OM}$  and  $EF_{BM}$ , and the calculation of the  $EF_{CM}$  were presented by PP ([www.mct.gov.br/index.php/content/view/74689.html](http://www.mct.gov.br/index.php/content/view/74689.html)), cross-checked and verified as correct due to the fact it comes from a official source (Brazilian DNA). **CAR#04** was closed out.

#### 4.7.4 Emission Reductions

It was possible to verify the PP correctly applied the table of Ers in the section B.6.4 of the PDD v.01 /1/. The projection starts on 01/06/2011 as well the starting date of the first crediting period (7 years).

### 4.8 Application of Monitoring Methodology and Monitoring Plan

**CAR#09** was raised tasking PP to provide evidences for the reference plant and the data/parameters used in the Ers calculation. For more detailed information, please see section B.10.1 and B.11.1 of the Table 2 of the Annex 2 of this report.

-  $EG_{project\ plant,y}$  : Net quantity of electricity generated in the project plant during the year  $y$  ;

- $EF_{grid,y}$  : CO<sub>2</sub> emission factor for grid electricity during the year  $y$  ;
- $EF_{BM,grid,y}$  : CO<sub>2</sub> build margin emission factor for grid electricity during the year  $y$  ;
- $EF_{OM,grid,y}$  : CO<sub>2</sub> operating margin emission factor for grid electricity during the year  $y$  ;
- $BF_{K,y}$  : Quantity of biomass residue type  $k$  combusted in the project plant during the year  $y$  ;
- **Moisture content of the biomass residues** ;
- $NCV_K$  : Net Calorific Value of biomass residue type  $k$  ;

The reference plant was evidenced through the References 16, 17a and 18a as shown and explained in the section 4.7.2 above. The monitored parameters presented in the PDD version 2 (Ref.1b), including their monitoring frequency and QA/QC procedures, are in accordance with the methodology applied by the PP and evidences of them were given when necessary, so the **CAR#09** was closed out (refer to Annex 3 for details).

As the project is not implemented yet, it was requested to the PP to provide, before the first verification, the procedures implemented to guarantee that the project will follow the required by the methodology in order to assure the delivery of high quality data. **FAR#10** was raised.

São Fernando plant will organise the staff training in the appropriate monitoring, measurement and reporting techniques. About the company's chart of responsibility for the CDM project activity, it was presented in the section B.7.2 of the PDD and explained during the site visit as:

- The General Manager of Usina São Fernando is the responsible for the project activity;
- Zeroemissions is responsible for the Quality Assurance;
- Technical department é responsible for management/ data collection (laboratory is responsible for the measurements of the moisture content and net calorific value of the bagasse);
- Financial department is responsible for the verification/invoices collection;
- The responsible for the cogeneration unit of the plant will be the person in charge for organising the staff training.

The PDD sufficiently described the parameters to ensure that the verification and proper implementation of the monitoring plan, to ensure that the delivery of high quality data is free from potential for biases or intended or unintended changes in data records. It is the of the validation team's opinion that the monitoring plan described in the PDD is feasible within the project design. The monitoring plan, data management, quality assurance and quality control procedures, are sufficient to ensure that the emission reductions achieved from the proposed project activity can be reported and verified if implemented as described and required in the applied methodology and tools. Considering that the PP is following the methodologies the monitoring plan is feasible and the PP is considered able to implement.

#### **4.9 Duration of the Project Activity and Crediting Period**

The PP stated in the section C.1 of the PDD version 01, that the operational lifetime of the project activity is 20 years, which was the technical lifetime of the steam turbine (ref. 8b) and the DOE considered it as valid and conservative due to the fact the "Tool to determine the remaining lifetime of equipment" version 01 (ref. 2d) released in the EB50 Annex 15, states a default value for technical lifetime of 25 years for this kind of equipment.

The operational lifetime exceeds the first crediting period, which is a "Renewable" crediting period (7 years).

Section C.1.1 of the PDD version 1 is not complete as required by the PDD guidelines, **CAR#5** was raised.

The starting date of the project activity was considered the purchase of the turbine (Ref.8a), dated 12/11/2007, and the starting date of the crediting period was set as 01/06/2011 or the registration date, whichever is later. **CAR#5** was closed out.



#### 4.10 Environmental Impacts

In Brazil for any project to get started and eventually become operational, the project must obtain three environmental licenses from the states environmental agency and each one can not be obtained before the previous license:

- LAP, Preliminary Environmental License
- LAI, Environmental Installation License
- LAO, Environmental Operational License.

The environmental aspects of the project activity were analyzed by the Environmental Agencies when it issued the licenses. The DOE verified the installation license nº 129/2008 (Ref.15), issued by IMASUL (State Environmental Institute) on 22/12/2008 and the protocol sent to the environmental agency in order to get the Operation License (Ref.15) that will be issued by IMASUL before the project activity starts to operate.

#### 4.11 Local Stakeholder Comments

The following stakeholders were correctly contacted (between the dates 24<sup>th</sup> March and 13<sup>th</sup> April 2009), as stated in the Brazilian DNA Resolution number 07.

It was verified the Confirmation of Receipt of the Letters by the local stakeholders (Ref.20b) :

- Dourados City Council
- Dourados Municipal Chamber
- Public Ministry of the State of Mato Grosso do Sul
- Environmental Secretary (SEMAC)
- Public Federal Ministry (Procuradoria MS)
- Union of the Sugar and Alcohol Industry of the State of Mato Grosso do Sul
- Institute of Environment of Mato Grosso do Sul (IMASUL)
- UDOP – Bioenergy Producers Association
- UNICA – Sugarcane Industry Association
- CTC – Sugarcane Technology Centre
- Brazilian Forum of NGOs and Social Movements for Environment and Development – FBOMS

Regarding the local stakeholders consultation, resolution number 7 of the Brazilian DNA dated 5<sup>th</sup> March 2008, establishes that the PP shall “*II – inform the specific electronic address for the web site where copies can be obtained, in Portuguese, of the last available version of the project design document in question, as well as the description of the project activity’s contribution under the Clean Development Mechanism towards sustainable development, as per Annex III of Resolution no. 1 of this Commission, guaranteeing this site will remain accessible at least until conclusion of the project activity registration process by the CDM Executive Board*”. It was verified that this requirement was not met due to the fact the PDD was not available in the local language (Portuguese). **CAR#12** was raised.

The Sugarcane Technology Centre (CTC) was the only local stakeholder who commented the consultation asking for more information about CDM projects developed by companies associated to the institution (Ref.20c). In fact the PDD in Portuguese was available and was sent through the email to CTC (Ref.20c) and the **CAR#12** was closed out.

Comment received on 12/04/2008 from Sugarcane Technology Centre (CTC): “Estimated Javier Becerra. We received the presentation letter of the CDM projects of the Mills São Luiz, São João and Biolins. We are interested in more information about these projects and other associated to CTC.”

As a response the PP sent on 03/08/2009 an email to CTC with the PDD in Portuguese and the document describing the sustainable development contribution of the proposed project activity as per Annex III of the Resolution number 1 of the Brazilian DNA.

## 5. Comments by Parties, Stakeholders and NGOs

In accordance with sub-paragraphs 40 (b) and (c) of the CDM modalities and procedures, the project design document of a proposed CDM project activity shall be made publicly available and the DOE shall invite comments on the validation requirements from Parties, stakeholders and UNFCCC accredited non-governmental organizations and make them publicly available. This chapter describes this process for this project.

### 5.1 Description of how and when the PDD was made publicly available

The Project Design Document for this project was made available on the UNFCCC website <http://cdm.unfccc.int/Projects/Validation/DB/V549C1M9B82HX89AI081SPZSD545X8/view.html> and was open for comments from 24 April 2009 until 23 May 2009. Comments were invited through the UNFCCC CDM homepage

### 5.2 Compilation of all comments received

Comment Number	Date Received	Submitter	Comment
0			

### 5.3 Explanation of how comments have been taken into account

No comments received.

## 6. List of Persons Interviewed

Date	Name	Position	Description of Subject Discussed
27/04/2009	Thalita P. U. Bôas	Electrical Engineer	Project data
	Otávio Gonçalves Perxina	Cogeneration and Electricity Supervisor	Project data
	Javier Becerra Sanches	CDM Technical Consultant – Zeroemissions	PDD development, Project data, local stakeholder
	Ferran Tejada Valero	CDM Technical Consultant – Zeroemissions	PDD development
	Paulo César Costa	Industrial Manager	Environmental license, EIA
	Valter M. Lopes	Production Supervisor	Project data, monitoring
	Paulo Cesar Escobar	Superintendent Director	Monitoring

## 7. Document References

Category 1 Documents (documents provided by the Client that relate directly to the GHG components of the project, (i.e. the CDM Project Design Document, confirmation by the host Party on contribution to sustainable development and written approval of voluntary participation from the designated national authority):

1a	PDD version 01, dated 31/03/2009
1b	PDD version 02, dated 28/08/2009
1c	PDD version 03, dated 02/06/2010
1d	PDD version 04, dated 21/09/2010 (final version)
2	Methodology ACM0006 version 10
2a	Combined tool to identify the baseline scenario and demonstrate additionality (version 02.2)
2b	Tool for the demonstration and assessment of additionality (version 05.2)
2c	Tool to calculate the emission factor for an electricity system (version 2)
2d	Tool to determine the remaining lifetime of equipment (version 01)
3a	LoA
3b	MoC

Category 2 Documents (background documents used to check project assumptions and confirm the validity of information given in the Category 1 documents and in validation interviews):

4a	Power Purchase Agreement with CCEE, CER N° 16/08
4b	Auction prices result, 14/08/2008
4c	Energy purchase proposal, 02/03/2009
4d	Auction conditions, N° 01/2008, 10/09/2008
4e	Energy sale communications
5	Production estimatives (5 yrs), 16/06/2008
6	USF Operating Expenses spreadsheet to support investment analysis, 2007
7	Insurance contract
8a	Turbine purchase contract, 12/11/2007
8b	Turbine technical specification
9	USF_Financial Analysis_ver.02 (2007)
10a	BNDES loan contract, 03/02/2009
10b	Cash Flow (loan contract)
11	WACC 2007
12a	Minutes meeting Sept.2007
12b	Zeroemissions proposal (Oct.2007)
12bi	Zeroemissions proposal (March.2008)
12bii	Zeroemissions proposal (Aug.2008)
12c	Zeroemissions CDM contract, 26/11/2008
12d	Minutes meeting CDM_31 01 07
13a	Despacho ANEEL, 02/05/2008
13b	Portaria ANEEL, 20/02/2009
13c	Technical Info sent to ANEEL, 30/04/2008
14a	Boiler purchase contract, Nov 2007

14b	Technical evaluation of the equipment (boiler), Jul 2009
14c	Generator commercial proposal, 18/09/2007
14d	Generator inspection, 14/04/2009
15	Environmental Licenses, LI Nº 129/2008
16	Usina São Fernando_CER Calculation_ver.02
17a	CONAB-Perfil Setor Sucroalcoleiro April 2008
17b	Procknor Engineer, 06/08/2007
18a	NCV determination procedure, 24/04/2009
18b	Pol, Brix, fiber and humidity procedure, 06/05/2009
19	Usina São Fernando – Confirmation Receipts from Local Consultation
20	PDD_Sao Fernando_ver.01_português
20a	USF - Carta stakeholders
20b	ARs stakeholders SFBC Project
20c	Stakeholder contact
21a	USF_Responsável Projeto MDL
21b	USF_Formação monitoramento
22	Resolution nº 1 – DNA, 11/09/2003
23	2008 Brazilian sugarcane harvest, Dec 2008
24	UNICA - Industry Union of Sugarcane
25	National Agroenergy Plan / 2006 - 2011
26	SELIC Rate
27	Cost of debt of Grupo Bertin at the time of the investment analysis. This is the value that the company uses for WACC calculation for the whole holding projects (on July 2007)
28	Debit Equity: Expected percentage of debt/equity of the holding group. This is the percentage used for WACC calculation for the whole holding projects (on July 2007)
29	Taxes evidence

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## A.1 Annex 1: Local Assessment

This checklist is designed to provide confirmation of in-country data and information provided in the Project Design Document for São Fernando Biomass Cogeneration Project.

It serves as a “**reality check**” on the project that is completed by a local assessor from SGS Brazil.

Issue	Findings	Source/Mean of Verification	Further Action / Clarification / Information Required?
Check evidence to confirm that the project participants possess ownership or licenses which will allow the implementation of the project at that site.	The name of the mill “São Fernando Álcool e Açúcar Ltda” is shown in several documents, as the auction results /4b/, contract for the energy sold in the auctions-PPA /4a/, ANEEL document /13a/. Also verified the contract between São Fernando Álcool e Açúcar Ltda and Zeroemissions do Brasil Ltda. /12d/.	/4a/ /4b/ /12d/ /13a/	No
Check evidence for the installed capacity of 128MW.	The total installed capacity (128 MW) can be confirmed through the ANEEL despacho nº 1755, 02/05/2009 (Ref.13a).  The first stage of the project activity (48 MW) can be through the Ministry of Mines and Energy (MME) portaria nº 90, 20/02/2209 /13b/	/13a/ /13b/	No
Check evidence for the geographical coordinates: Latitude: 22° 18' 49" S / Longitude: 54° 55' 48" W.	CAR#06 was raised to address PP that the seconds of the geographical coordinates presented in the PDD version 1 are not according to the document provided during site visit (ANEEL technical spreadsheet) /13c/.  To close out CAR#06 PP revised the PDD. The correct numbers are: Latitude: 22°18' 53" S / Longitude: 54° 55' 57" W.  CAR#06 was closed out.	/13c/	CAR #06 No
Check evidence for the project planning (stages I, II and III), and the equipments (boiler, turbine, generator, substation, transformer).	During site visit it was possible to verify that stage I of the project is being implemented and has the license for it /13b/. From the energy plan /5/ it is possible to verify that the energy generation will increase in the next 5 years, as described in the PDD.	/5/ /13b/	No

Check evidence for the estimation of emission reductions (spreadsheet with formulas).	The estimation of emission reductions were confirmed through the spreadsheet of CER calculation /16/ and are according to the methodology ACM0006 v.10 /2/.	/16/ /2/	No
Check evidence that no other biomass types than biomass residues will be used.	It is possible to confirm through boiler technical sheet /14b/ that the equipment is projected to operate using sugar cane bagasse as fuel.	/14b/	No
Check that the implementation of the project will not result in an increase of the processing capacity.	The total installed capacity of the project will be 128 MW. This is a Greenfield project and the project is being implemented. The bagasse used as fuel in the boilers to generate electricity is a by product of the sugar and alcohol market. The increase in its generation would be consequence of the sugar and alcohol market.	Site visit	No
Check that the biomass will not be stored for more than one year.	It was informed through interviews that the bagasse will not be stored for more than one year. PP will store some bagasse from one crop season to another to start up the boilers. This period is approximately 4-5 months.	Site visit	No
Check that no significant energy is necessary to prepare the biomass for fuel combustion.	The biomass does not need to be processed/ prepared to be used as fuel in the boilers.	Site visit	No
Check that there is no fossil fuel consumption or electricity consumption associated to the project (on-site, off-site).	During site visit, it was possible to observe that the São Fernando mill will produce bagasse internally which will be transported to its cogeneration facility through electrical and/or mechanical conveyor belts which will operate using electricity and/or steam generated in the biomass residue cogeneration facility, hence there will not be fossil fuel consumption within the project boundary or fossil fuel consumption attributable to the project activity	Site visit	No

Step 1b of the combined tool: check evidence for the consistency with all mandatory applicable law and regulations.	<p>The sub-step 1b: Consistency with mandatory laws and regulations of the PDD version 1 does not present information about how the requirements of mandatory laws in Brazil were checked. CL#07 was raised.</p> <p>The revised PDD and the response to CL#07, presented that the compliance with the mandatory laws in Brazil of the alternatives to the project activity were checked through the environmental licenses from the environmental agency (SEMAC) and a report from CONAB (official source).</p> <p>CL#07 was closed out.</p>	<p>/13a/ /13b/ /15a/ /15b/</p>	<p>CL #07 No</p>
<p>Check the financial analysis spreadsheet with formulas, assumptions and related evidences.</p> <p>Please provide the evidence of all assumptions used in the financial analysis.</p>	<p>The evidences of investment in equipments /8a/ /14a and c/, implementation /12c/ and operation/maintenance /10b/ were provided to confirm the costs expenses of the project activity.</p> <p>The financial spreadsheet named "USF_Financial Analysis ver.02" was provided by the PP.</p> <p>See opening and closure of the CAR#01 in the Annex 3.</p>	<p>/8a/ /9/ /12c/ /14a/ /14c/</p>	No
Check how the 20 years lifetime was selected.	<p>Verified in the technical evaluation of the equipment report that the minimum lifetime of the boiler is 20 years /14b/.</p>	/14b/	No
Check the sensitivity analysis spreadsheet with formulas.	<p>The objective of the sensitivity analysis is to determine in which scenarios the project would pass the benchmark or become more favorable than the alternative.</p> <p>The sensitivity analysis presented in PDD version 1 does not follow the requirements of the Combined Tool. The initial investment cost that constitute more than 20% of total project cost and energy that represents the main revenue were not analyzed in the sensitivity.</p> <p>With the result of the sensitivity analysis it is not possible to conclude that project is not financially attractive since some items the IRR pass the project IRR.</p> <p>For information about the sensitivity analysis, please, see the opening and closure of the CAR#02 in the Annex 3.</p>		<p>CAR#02 No</p>



Check evidences used in the common practice analysis. Provide copy of the documentation.	See the opening and closure of the CL#08 in the Annex 3.	/17a/	<del>CL#08</del> No
Check evidences for the CDM consideration. Provide timeline according to EB41 Annex 46 requirements.	The CDM consideration should be presented according to EB41 Annex 46. With the information provided in the PDD version 1 it is not possible to confirm that real actions was taken to implement the project activity considering the CDM.  See closure of the CAR#03 in the Annex 3.	/8a/ /12/	<del>CAR#03</del> No
Check emission factor source data and calculation.	PDD version 1, section B.6.2: The parameters used to calculate the emission factor shall be presented in the section B.7.1 of the PDD, monitored parameters.  See the opening and closure of the CAR#04 in the Annex 3.		<del>CAR#04</del> No
Check monitoring plan: project responsibilities, project operation, procedures, calibration, registering, archiving, training, etc.	See the opening and closure of the CAR #09 in the Annex 3.  FAR#10 will remain to be closed at the first verification.		<del>CAR#09</del> FAR#10 No

Check local stakeholder consultation.	<p>Letters were sent to:</p> <ul style="list-style-type: none"> <li>-Dourados City Council (received on 24/03/2009)</li> <li>- Dourados Municipal Chamber (received on 13/09/2009)</li> <li>- Public Ministry of the State of Mato Grosso do Sul (received on 25/03/2009)</li> <li>- Federal Prosecutor's Office (received on 24/03/2009)</li> <li>- Environmental Secretary (SEMAC) (received on 24/03/2009)</li> <li>- Public Federal Ministry (Procuradoria MS) (received on 24/03/2009)</li> <li>- Union of the Sugar and Alcohol Industry of the State of Mato Grosso do Sul (received on 24/03/2009)</li> <li>- Institute of Environment of Mato Grosso do Sul (IMASUL) (received on 24/03/2009)</li> <li>- UDOP – Bioenergy Producers Association (received on 24/03/2009)</li> <li>- UNICA – Sugarcane Industry Association (received on 06/04/2009)</li> <li>- CTC – Sugarcane Technology Centre (received on 25/03/2009)</li> <li>- Brazilian Forum of NGOs and Social Movements for Environment and Development – FOBMS (received on 24/03/2009)</li> </ul> <p>See opening and closure of CAR#12 in the Annex 3.</p>	<p>/19/ /20/ /20a/ /20b/ /20c/</p>	<p>CAR#12 No</p>
Check environmental license.	<p>Verified the installation license nº 129/2008, issued by IMASUL 22/12/2008 /15/. Also verified the protocol sent to the environmental agency in order to get the Operation License /15/.</p>	<p>/15/</p>	<p>No</p>

## A.2 Annex 2: Validation Checklist

**Table 1 Participation Requirements for Clean Development Mechanism (CDM) Project Activities (Ref PDD, Letters of Approval and UNFCCC website)**

Requirement	Reference	Comments	Conclusion/CARs/CLs
<p>1. All Parties involved have approved the project activity</p> <p>1.1. Has the DNA of each Party involved in the proposed CDM project activity in section A.3 of the PDD provided a written letter of approval which confirms</p> <p>1.1.1. The country is a Party to the Kyoto Protocol</p> <p>1.1.2. Participation is Voluntary</p> <p>1.1.3. The Host Party confirming that the proposed CDM project activity contributes to sustainable development of the country Non-Annex 1 Party shall submit a letter of approval</p> <p>1.1.4. It refers to the precise proposed CDM project activity title in the PDD being submitted for registration</p>	<p>Annex 3, Clean Development Mechanism, Validation and Verification Manual, Version 01 (from this point forwarded referenced as VVM) - 49a-d /54a-b/125</p> <p>Paragraph 37 CDM Modalities and procedures</p>	<p>Brazil is listed as the non-Annex-I Party, has ratified the protocol on 23<sup>rd</sup> August 2002 and is allowed to participate</p> <p><a href="http://maindb.unfccc.int/public/country.pl?country=BR">http://maindb.unfccc.int/public/country.pl?country=BR</a></p> <p>There is no letter of approval from DNA Brazil at this phase (just after submission of validation report).</p>	Pending
<p>1.2. If the project participant(s) listed in the PDD published at international stakeholder consultation are not included in the PDD submitted with request for registration, a letter should be obtained from the withdrawn project participant(s) confirming its voluntary withdrawal from the proposed project activity.</p>	EB 30 Para. 41.	The PPs listed in the section A.3 and in the Annex 1 of the PDD version 1 and final version 2 are the same.	YES

1.3. The letter/s of approval are unconditional with respect to 1.1.1 to 1.1.4 above	VVM Para. 49/54	There is no letter of approval from DNA Brazil at this phase (just after submission of validation report).	Pending
2. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof, and be entered into voluntarily	VVM Para. 54  Marrakech Accords, CDM Modalities §29 and §30  Kyoto Protocol Art. 12.2, Marrakech Accords, CDM Modalities §40a	There is no letter of approval from DNA Brazil at this phase (just after submission of validation report).	Pending
3. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for a minimum of 30 days, and the project design document and comments have been made publicly available	VVM Para. 128  Marrakech Accords, CDM Modalities, §40	The global stakeholder consultation started on 24 April 2009 until 23 May 2009 and no comments were received.  The PDD is available in the address <a href="http://cdm.unfccc.int/Projects/Validation/DB/V549C1M9B82HX89AI081SPZSD545X8/view.html">http://cdm.unfccc.int/Projects/Validation/DB/V549C1M9B82HX89AI081SPZSD545X8/view.html</a> of the UNFCCC website.	YES
4. The project design document is in accordance with the applicable CDM requirements for completing PDDs.	VVM Para. 57  Marrakech Accords, CDM Modalities, Appendix B, EB Decisions	Yes, all the versions of the PDD provided by the PP were in compliance with the PDD Template version 3 for Large scale project activities.	YES
5. Please state the project participants listed in the PDD and check with which of these project participants does SGS have a contract for the projects validation	Para 37 CDM M & P  Para 7 EB 50 Annex 48	Project participants listed in the PDD:  São Fernando Açúcar e Álcool Ltda and Zeroemissions do Brasil Ltda.  The validation contract was signed with Zeroemissions do Brasil Ltda one of	Yes

		the project participant.	
6. If the project participant(s) listed in the PDD published at international stakeholder <sup>1</sup> consultation are not included in the PDD submitted with request for registration, a letter should be obtained from the withdrawn project participant(s) confirming its voluntary withdrawal from the proposed project activity.	EB 30 Para. 41. EB50 Annex 48 Para. 8	Not applicable because the project participants listed in the PDD published for international stakeholder consultation are the same of the final PDD version 2.	Yes
7. Confirm while submitting a request for registration – all of the project participants with a contractual relationship are still listed in the PDD.	EB50 Annex 48 Para.7-9	Pending RFR after LoA	Pending
8. Project participants who are listed in the PDD (submitted for global stakeholder consultation) but who do not have a contractual relationship with SGS for the purposes of the validation activity may be removed from the PDD which is submitted for registration	EB50 Annex 48 Para.7-9	Not applicable	Yes
9. SGS may restart the validation activity through the new or revised contract with a different set of project participants by; a. Indicating that the first validation contract has been terminated and; Republishing the PDD or revised PDD for global stakeholder consultation.	EB50 Annex 48 Para.7-9 (If applicable)	Not applicable	Yes
10. The letter/s of approval are unconditional with	VVM Para. 49/54	Pending LoA	Pending

<sup>1</sup> Stakeholders mean the public, including individuals, groups or communities affected, or likely to be affected, by the proposed CDM project activity or actions leading to the implementation of such an activity



respect to 1.1.1 to 1.1.4 above			
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**Table 2 PDD**

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
<b>A. General Description of Project Activity</b>				
<b>A.1. Project Title</b>				
A.1.1. Does the used project title clearly enable the reader to identify the unique CDM activity?	VVM Para.56 Guidelines for completing a CDM-PDD (PDD) section A.1	DR	The title "São Fernando Biomass Cogeneration Project" identifies the unique CDM project activity.	YES
A.1.2. Is there an indication of a revision number and the date of the revision?	VVM Para.56 PDD section A.1	DR	Yes. PDD version 4, dated 21/09/2010 (final version).	YES
<b>A.2. Description of the Project Activity</b>				
A.2.1. Does the description of the proposed CDM project activity as contained in the PDD sufficiently cover all relevant elements accurately?	VVM Para.59 PDD section A.2 see also A.4, A.4.3 and B.3	DR	<p>The project consists of a new sugarcane bagasse fired cogeneration unit at the São Fernando mill. The total installed capacity generation is 128MW.</p> <p>The technology of the project will use biomass as fuel in a high pressure boiler and high pressure steam will be generated and expanded in the back pressure turbine, generation power and steam.</p> <p>It is expected that the project activity will help Brazil to fulfil its goals of promoting sustainable development. The contributions of the project activity for this were described in the PDD, and comprises, among others: environmental benefits (reducing fossil fuel generation and project developed by the environmental program of the company); social and economical benefits.</p>	YES
A.2.2. Does the information provide the reader with a clear understanding of	VVM Para.60 PDD section A.2 see also A.4, A.4.3 and	DR	Yes, the project consists of a renewable energy generation using sugar cane bagasse as fuel.	YES

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
the proposed CDM activity?	B.3			
A.2.3. Is all information provided consistent and in compliance with the actual situation or planning?	VVM Para.64 PDD section A.2 see also A.4, A.4.3 and B.3	DR Site visit /5/ /13/ /15/	During site visit it was possible to verify that stage I of the project is being implemented and has the license for it /13/15/. From the energy plan /5/ it is possible to verify that the energy generation will increase in the next 5 years, as described in the PDD.	YES
A.2.4. Is all information provided consistent with details provided in further chapters of the PDD?	VVM Para.64 PDD section A.2	DR Site visit	The information of the Section A.2 of the PDD is consistent with further chapters. Verified during site visit, that the mill and the cogeneration power plant are being implemented.	YES
<b>A.3. Project Participants</b>				
A.3.1. Is the table required for the indication of project participants correctly applied?	VVM Para. 51 PDD section A.3	DR	The table is correct applied. Brazil is the only Party involved in the project.  The project participants are São Fernando Álcool e Açúcar Ltda. and Zeroemissions do Brasil Ltda.	YES
A.3.2. Is all information provided in consistency with details provided by further chapters of the PDD (in particular Annex 1)?	VVM Para. 51 PDD section A.3	DR	The description of section A.3 is consistent with the information described in Annex 1 of the PDD.	YES



Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
<b>A.4. Technical Description of the Project Activity</b>				
A.4.1. Does the information provided on the location of the project activity allow for a clear identification of the site(s)? Are the latitude and longitude of the site indicated (decimal points)	VVM Para.64 PDD section A.4	/13c/	CAR#6 was raised to address PP that the seconds of the geographical coordinates presented in the PDD version 1 are not according to the document provided during site visit (ANEEL technical spreadsheet) /13c/.  To close out CAR#06, the PP revised the PDD. See Annex 3.  The correct numbers are:  Latitude: 22° 18' 53" S / Longitude: 54° 55' 57" W.	<del>CAR#06</del> YES
A.4.2. Does the proposed CDM project activity involve the alteration of existing installations or process?	VVM Para.64 PDD section A.4	DR Site visit	No, this is a Greenfield project. The project activity is being implemented.	YES
A.4.3. Do the project participants possess ownership or licenses which will allow the implementation of the project at that site / those sites?	VVM Para.64 PDD section A.4	DR /4a/ /4b/ /13a/ /12c/	The name of the mill "São Fernando Álcool e Açúcar Ltda" is shown in several documents, as the auction results /4b/, contract for the energy sold in the auctions-PPA /4a/, ANEEL document /13a/. Also verified the contract between São Fernando Álcool e Açúcar Ltda and Zeroemissions do Brasil Ltda. /12c/.	YES
A.4.4. Is the category(ies) of the project activity correctly identified?	VVM Para.64 PDD section A.4	DR	Yes. The project category is renewable electricity generation for a grid, sectoral scope 1. This is in accordance t the UNFCCC web site.	YES
A.4.5. Is all information provided in compliance with actual situation or planning as available by the project participants?	VVM Para.64 PDD section A.4	DR /13/	Yes, verified that the proposed project activity has the environmental license applicable to the actual situation.	YES

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
A.4.6. Is the table required for the indication of projected emission reductions correctly applied?	VVM Para.64 PDD section A.4	DR	Yes, the table follows the required by the guidelines.	YES
<b>A.5. Public Funding</b>				
A.5.1. Does the information on public funding provided conform to the actual situation or planning as presented by the project participants?	PDD section A.4.5	DR	No public funding is being used for the project activity.	YES
A.5.2. Is all information provided consistent with details provided by further chapters of the PDD (in particular annex 2)?	PDD section A.4.5	DR	No public funding is being used for the project activity.	YES
A.5.3. In case of public funding from Annex I Parties is it confirmed that such funding does not result in a diversion of official development assistance	PDD section A.4.5	DR	Not applicable.	YES
<b>B. Baseline and Monitoring Methodology</b>				
<b>B.1. Choice and Applicability</b>				
B.1.1. Is the baseline methodology previously approved by the CDM Methodology Panel?	VVM Para.68 PDD section B.1	/2/ UNF CCC	Yes, methodology ACM0006, version 10 /2/ is applied.	YES

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
		web site		
B.1.2. Has the methodology (incl. the tools) been altered from the original version as referenced in the PDD?	VVM Para.69 PDD section B (B.1-B.2)	/2/ /2b/ /2c/  UNF CCC web site	Yes, the methodologies and tools are available at the UNFCCC web site: <ul style="list-style-type: none"> <li>Methodology ACM0006 - version 10: "Consolidated baseline methodology for grid-connected electricity generation from biomass residues in power and heat plants". /2/</li> <li>"Combined tool to identify the baseline scenario and demonstrate additionality"; version 02.2. /2a/</li> <li>"Tool to calculate the emission factor for an electricity system"; version 01.1. /2c/</li> </ul>	YES
B.1.3. Is the selected approved methodology applicable to the project activity in the PDD?	VVM Para.75/66a/68/73 PDD section B (B.1-B.2)	SV In /13a/ /14b/	The project activity complies with the methodology applicability criteria: <ul style="list-style-type: none"> <li>Verified through boiler technical sheet /14b/ that the equipment is projected to operate using sugar cane bagasse as fuel.</li> <li>The total installed capacity of the project will be 128 MW /13a/. This is a Greenfield project and the project is being implemented. The bagasse used as fuel in the boilers to generate electricity is a by product of the sugar and alcohol mill. The increase in its generation would be consequence of the sugar and alcohol market.</li> <li>It was informed through interviews that the bagasse will not be stored for more than one year. PP will store some bagasse from one crop season to another to start up the boilers. This period is approximately 4-5 months.</li> <li>The biomass does not need to be processed/ prepared to be used as fuel in the boilers.</li> </ul>	YES

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
			<ul style="list-style-type: none"> <li>During site visit, it was possible to observe that the São Fernando mill will produce bagasse internally which will be transported to its cogeneration facility through electrical and/or mechanical conveyor belts which will operate using electricity and/or steam generated in the biomass residue cogeneration facility, hence there will be no fossil fuel consumption within the project boundary or fossil fuel consumption attributable to the project activity.</li> </ul>	
B.1.4. Is the discussion in the PDD in conformance with all applicability criteria of the applied methodology?	VVM Para.75/66b/68 PDD section B (B.1-B.2)	DR /2/	Yes, PDD follows the requirements of the methodology.	YES
<b>B.2. Project Boundary</b>				
B.2.1. Are all emission sources and gases related to the baseline scenario, project scenario and leakage clearly identified and described in a complete and transparent manner? Is there information on GHG emissions in proposed CDM project activity boundary as a result of the implementation of the proposed CDM project activity which are expected to contribute more than 1% of the	VVM Para.79/76 /67a PDD section B.3	DR /2/	The description of the sources and gases included in the baseline and project activity are in accordance with the requirements of the methodology. There will be no unexpected emissions resulting from the project activity. The main source in the baseline scenario is the CO2 emission from the grid electricity generation.	YES

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
overall expected average annual emissions reductions, which are not addressed by the applied methodology.				
B.2.2. In case of grid connected electricity projects: Is the relevant grid correctly identified in accordance with the tool to calculate emission factor of electricity system version 2 (wherever applicable) and the underlying methodology?	VVM Para.79 PDD section B.3 EB 50 Annex 14	DR MCT web site	The Brazilian grid is the grid applicable to the project activity. The emission factor of the Brazilian grid is calculated by Brazilian DNA, using data from ONS. Information is publicly available at: <a href="http://www.mct.gov.br/index.php/content/view/74689.html">www.mct.gov.br/index.php/content/view/74689.html</a> (MCT web site)	YES
B.2.3. Does the project boundary include the physical delineation of the proposed CDM project activity?	VVM Para.78/79 PDD section B.3 also see section A.4.3	DR /8/ /14/	The PP included in the project boundary section, B.3, a diagram indicating the physical delineation of the project activity with its equipments.	YES
B.2.4. Are the project's geographical boundaries and the project's system boundaries (components and facilities used to mitigate GHGs) clearly defined?	VVM Para.76/79 PDD section B.3 also see section A.4.3	DR	Yes. See section B.2.3 above.	YES
<b>B.3. Identification of the Baseline Scenario</b>				
B.3.1. Does the PDD discuss the identification of the most likely baseline scenario? Does the PDD	VVM Para.67b.80/82/86 PDD Section	DR /2/ /18a/	The identification of the baseline scenario follows the requirements of the methodology ACM0006, version 10. For <b>power</b> generation, the alternatives P4 and P5 are considered realistic and credible;	YES

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
follow the steps to determine the baseline scenario required by the methodology and is the application of the methodology and the discussion and determination of the chosen baseline transparent?	B.4/B.5		<p>For <b>heat</b> generation, the alternative H2 is considered realistic and credible; For the use of <b>biomass</b>, the alternative B4 is considered realistic and credible.</p> <p>In conclusion, the scenario #4 of the methodology is identified as the baseline scenario. The proposed project activity involves the installation of a new biomass cogeneration plant (Greenfield). The reference plant that would be installed instead of the project activity at the same site was explained during validation assessment. The reference plant has the same thermal firing capacity but lower efficiency of electricity generation. The same type and quantity of fuel (sugar cane bagasse) will be used in both scenarios (scenario B4). The power generated by the proposed project plant would be generated in the reference plant (scenario P5). The power generation is larger in the proposed project plant (scenario P4). The reference plant is also a cogeneration plant (scenario H2).</p>	
B.3.2. Are all tools/procedures in the methodology correctly applied to identify the most reasonable baseline scenario? This includes all potential realistic and credible baseline scenarios in the discussion taking into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	VVM Para.81/82/86a- d/83/84  PDD Section B.4/B.5	DR	Yes, see section B.3.1 above.	YES
B.3.3. Is the choice of the baseline compatible with	VVM Para.86b-c/95  PDD Section	DR	Yes, see section B.3.1 above	YES

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
the available data?	B.4/B.5			
B.3.4. Is conservativeness addressed in the way of identifying the baseline?	VVM Para.90 PDD Section B.4/B.5	DR	See CAR#09 in the section B.6.1.	YES
B.3.5. Does the selected baseline represent the most likely scenario among other possible and/or discussed scenarios?	VVM Para.90/91 PDD Section B.4/B.5	DR	Yes. See section B.3.1 above.	YES
B.3.6. Is there a verifiable description of the baseline scenario? Does this include a description of the technology that would be employed and/or the activities that would take place in the absence of the proposed CDM project activity?	VVM Para.86e/85 PDD Section B.4/B.5	DR	Yes, the baseline scenario identified corresponds to the scenario #4 of the methodology ACM0006. In the absence of the project activity, there would be the construction of a cogeneration plant, fired with the same type and quantity of biomass residues, but with a power generation efficiency which is common practice in the sector. This means the installation of less efficient boilers and turbines. This plant would not have enough capacity for generating energy in order to cover its own needs and should import a part of energy from the grid. In this case the difference between the power generated by the project plant and the less efficient plant would be generated by other facilities that are connected to the grid and are not under control of the project participants.	YES
<b>B.4. Additionality</b>				
B.4.1. Does the PDD clearly demonstrate the additionality using the approach as specified in the methodology and by following all the required steps?	VVM Para.67d/95 PDD Section B.1/B.4/B.5	DR /2a/ /2b/	<p>According to the PDD version 3 /1/ the “Combined tool to identify the baseline scenario and demonstrate additionality” it is correct applied and in accordance with the approved methodology.</p> <p>As per the “Combined Tool”, in cases where one or more alternatives are not available options to project participants, a different procedure than provided here would be required to demonstrate additionality and identify the baseline scenario. In this case the proposed project activity includes grid-connected power projects (where an alternative might be electricity</p>	<del>CAR #11</del> YES



Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
			<p>produced by other facilities not under the control of project participants). Project participants can continue to use, if desired, the additionality tool, and provide their own methods to develop and/or assess baseline scenario. <b>CAR#11 was raised.</b></p> <p>To close out CAR#11, the “Tool for the demonstration and assessment of additionality”; version 05.2 was applied by the PP in the PDD version 2. /1/. CAR #11 remains outstanding.</p> <p>The PDD version 3 was revised to apply the Combined toll to identify the baseline scenario and demonstrate additionality.</p> <p>According to the Combined tool, foot note 1: <i>“The Meth Panel is considering whether expanding this tool to cover all cases would be appropriate. In the meantime, methodologies that typically involve alternatives are not under the control of project participants can continue to use, if desired, the additionality tool (provides benchmark and other tools), and provide their own methods to develop and/or assess baseline scenario.”</i></p> <p>And as per the AM CLA 0120: to apply the Additionality tool the PP needs to provide their own approach to assess the baseline scenario supported by a deviation.</p> <p>The PP decided to not apply for a deviation, but to follow exactly the Combined tool in the PDD version 3.</p> <p>CAR #11 was closed out.. Refer to section B.4.3 bellow.</p>	
B.4.2. For small scale project activities is the additionality assessed in accordance with specific requirements for such projects?	VVM Para. 135	DR	Not applicable, the proposed project activity is a large scale project activity.	Yes
B.4.3. In case of using the additionality tool: Is the ‘Additionality Tool’	PDD Section B.1/B.4/B.5	DR /2/	<p>In the PDD version 4 /1/ the project activity, is applying the “Combined tool”.</p> <p>The “Combined tool to identify the baseline scenario and demonstrate</p>	<p>CL#01</p> <p>CAR#02</p>

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
used in the PDD latest version? If an earlier version has been used, do the changes impact the discussion in the PDD?  Are all steps followed in a transparent manner?		/2b/ /4/ /5/ /8/ /9/ /10/ /11/ /12/ /13/ /14/ /15/ /16/ /17a/	<p>additionality", version 2.2 / 2a/ is correctly applied in the PDD version 3 /1c/.</p> <p><b>Step 1: Identification of alternatives scenarios</b></p> <p><b>Sub-step 1a: Define alternatives to the proposed CDM project activity:</b></p> <p>The following alternatives were presented in the PDD:</p> <ul style="list-style-type: none"> <li>- the project activity not undertaking as a CDM project activity</li> <li>- the scenario #4 of the methodology ACM0006, version 10: the construction of a cogeneration plant, fired with the same type and quantity of biomass residues, but with a power generation efficiency (less efficient boilers and turbines). This plant would not have enough capacity for generating energy in order to cover its own needs and should import a part of energy from the grid. In this case the difference between the power generated by the project plant and the less efficient plant would be generated by other facilities that are connected to the grid and are not under control of the project participant</li> </ul> <p><b>Sub-step 1b: Consistency with mandatory laws and regulations</b></p> <p>CL#07 was raised to address PP that the sub-step 1b: Consistency with mandatory laws and regulations of the PDD version 1 does not present information about how the requirements of mandatory laws in Brazil were checked.</p> <p>It was added to the PDD version 2, information about how the requirements of mandatory laws in Brazil were checked. The PP provided the Construction License and the protocol of the Operating License of the project activity (Ref.15). Also, the Brazilian Electricity Energy Agency (ANEEL) authorized and established the PP as an independent power producer who can sell electricity to the interconnected grid (Ref. 13a, b and c). The CL#07 was closed out.</p>	<p>CL#07</p> <p>CL#08</p> <p>YES</p>

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
			<p><b>STEP 2: Barrier analysis</b></p> <p><b>Sub-step 2a: identify barriers that would prevent the implementation of alternative scenarios</b></p> <p>The main barrier presented in the PDD to implement the project activity is the high investment that it requires.</p> <p>As an additional clarification the DOE verified that according to the Chairman of the Brazilian National Sugarcane Association (UNICA, 13/08/2008, ref. 24), although energy generation from sugarcane bagasse in Brazil has a great potential, there are several issues that could prevent the implementation of this kind of projects, and also the proposed project São Fernando, such as:</p> <ul style="list-style-type: none"> <li>- Issues related to the project location: depending on the location of the project and the geographical configuration of the grid, the cost of connexion is too high. The sugar / ethanol companies are responsible to undertake this expenditure.</li> <li>- Investment and operating costs of energy cogeneration (due especially to the increase of costs of land, agricultural equipments, labour and steel).</li> </ul> <p>According to the Ministry of Agriculture, National Plan of Agroenergy 2006 - 2011 (ref. 25, page 72), investing in efficient equipments that generate extra electricity to export to the grid represents an important extra cost to the project activity. The sugarcane industry prefers to invest in medium technologies that generate higher incomes and less expenditure in a short term. Usually the revenues of selling electricity from a cogeneration project represent a small part of the total revenues of a sugar mill. Thus sugar mills tend to invest in their core business, sugar an ethanol, instead of investing in electricity generation for the grid.</p> <p>The increase of energy efficiency considers a technology that is not commonly used by the sector. In this way, more efforts will be necessary to train operators and adapt the processes, with a higher quality control of the bagasse being necessary and studies on the supply chain. The use of low efficient power plant is the common practice in the region and</p>	

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
			<p>sector.</p> <p><b><i>Sub-step 2b: eliminate alternative scenarios which are prevented by the identified barriers</i></b></p> <p>According to the information verified by the assessment team the barriers identified prevent the project implementation of the alternative scenarios.</p> <p>The alternative to this proposed project activity was to focus in its core business, which is the production of sugar and alcohol. Therefore, as the barrier mentioned above are directly related to investment in a cogeneration and entering into a new business of electricity sale, there is no impediment for the project to maintain its core business. Another characteristic of this sector is to understand that the sale of electricity from cogeneration represents only a small share of total annual revenues of sugar mills. As a consequence, sugar mills prefer investing in equipment related to their core business, the production of sugar and ethanol</p> <p>As still two alternative scenarios the project activity not undertaken as a CDM project activity and the construction of a cogeneration plant, fired with the same type and quantity of biomass residues, but with a power generation efficiency which is common practice in the sector, the project participant applied the step 3 of the Combined tool.</p> <p><b><i>STEP 3: Investment analysis</i></b></p> <p><b><i>Determine appropriate analysis method</i></b></p> <p>The investment analysis method chosen by PP was the benchmark analysis.</p> <p><b><i>Benchmark analysis</i></b></p> <p>The financial indicator used is project Internal Return Rate (IRR). In the first version of the PDD the project IRR was compared with SELIC (Basic Interest Rate). CL#01 was raised to address PP that the SELIC from the</p>	

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
			<p>last eight months (August 2008 – March 2009) was used for the comparison and the last value of 12.66% was adopted in the analysis. The period is not in accordance with PDD chronology, which presents the proposed starting date of 12/11/2007. According to the Guidance on the Assessment of Investment Analysis, the input values used in the investment analysis should be valid and applicable at the time of the investment decision taken by the project participant and not information available at an earlier or later point.</p> <p>To close out CL#01, the PP calculated the Weight Average Cost of Capital – WACC used by the Group Bertin (15.82%) for the period of the starting date of the project activity) (ref. 11). CL#01 was closed out.</p> <p><b>Calculation and comparison of financial indicators</b></p> <p>The appropriate analysis method utilized by the client was the Benchmark Analysis, where such analysis is based on the IRR (Internal Return Rate). The premises of the analysis was based on the electricity sales revenue, operating and maintenance costs, insurance, amortization of the equipments, re-investments based on depreciation, general, administrative and financial expenditures. Also, the client has considered 21 years as a lifetime of the project which ranges from 2008 to 2028 (ref. 9).</p> <p><b>Sensitivity analysis</b></p> <p>The sensitivity analysis presented in PDD version 1 does not follow the requirements of the Combined Tool. The initial investment cost that constitute more than 20% of total project cost and energy that represents the main revenue were not analyzed in the sensitivity. With the result of the sensitivity analysis it is not possible to conclude that project is not financially attractive since in some items the IRR pass the project IRR.</p> <p>CAR#02 was raised.</p> <p>After considering, from the client inputs, the IRR – Internal Rate of</p>	

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
			<p>Return is approximately 10.63% reaching the NPV – Net Present Value of about (BRL 35.9 million) – negative when utilizing the benchmark rate of 15.82%.</p> <p>The costs of the project activity were demonstrated by the PP through evidences 8a / 14a / 14c / which was cross-checked with the loan contract and cash flow evidences / 10a / 10b /.</p> <p>Taking into account the above items and the fact that the PP started to use the “<i>Combined tool</i>”, version 2.2 (ref. 2a), the DOE concludes the project is unfeasible.</p> <p>CAR#02 was closed out.</p> <p><b>STEP 4: Common practice analysis</b></p> <p><b>Analyze other activities similar to the proposed project activity</b></p> <p>In the common practice analyses section, there is no conclusion about the analysis related to the efficiency of the project activity, so the CL#08 was raised. After the addition, in the PDD version 2 (ref. 1b), of the information summarized bellow the CL#08 was closed out.</p> <p>In the section B.5 of the PDD, the PP states that the generation and exportation of electricity to the grid is recent, legally allowed since 2000 and so the industries use low pressure, low efficiency units for self-supply.</p> <p>According to ANEEL, the Brazilian installed capacity for electricity generation is 70% based on hydropower plants and only 3.53% relies on sugarcane biomass. The share of fossil fuel is 8%, and the foresee is the increase to 18% in until 2030.</p> <p>The National Supply Company (CONAB) states in its 2008 report (Ref.17a) that more than 89%of the energy produced by sugar and alcohol companies are for self-consumption and the efficiency of them</p>	

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
			<p>are very low, mainly in the State of Mato Grosso do Sul (69.4KW/ton).</p> <p>The National Agroenergy Plan 2006-2011 (ref. 25), developed by the Ministry of Agriculture, foresees for 2020 a decreasing participation of the sugarcane bagasse cogeneration in the composition of the national grid and an increase of the gas generation.</p> <p><b>Discuss any similar Options that are occurring</b></p> <p>There are currently 413 registered sugarcane units in registered in Brazil and 270 of them generate electricity, according to the National Electricity Agency (ANEEL), and according to a recent sectoral report of the CONAB (Ref.17a) in cooperation with the Ministry of Agriculture, none of the sugar and alcohol production plants located in the state of Mato Grosso do Sul currently exports electricity to the national grid and the efficiency of generation per ton of this state is the lowest amongs all other Brazilian states (69.4 KWh per ton of bagasse consumed, which means 2.68% efficiency, considering the NCV of the bagasse used in the project plant).</p> <p>According to the project participants' data, when São Fernando achieves its top generation capacity the plant will generate around 468 KWh per ton of bagasse consumed, which means 18.07% of efficiency, so the project activity is not a common practice. There is no similar plant identified in the state of Mato Grosso do Sul where the project is located.</p>	
B.4.4. Has all information been backed up with references, sources and certification? Is the data presented credible and reliable with complete transparency to all available data and documentation?	VVM Para.93/91 PDD Section B	DR	<p>All evidences were provided by the PP, and are reliable. Source of data was provided and comes from official and public websites or documents.</p> <p>See section B.4.2 above.</p>	YES
B.4.5. Is the discussion on	VVM Para.102b	DR	The project starting date is according to the required by EB 41. The starting date of 12/11/2007 corresponds to the date of the purchase of	CAR #03



Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
<p>additionality and the evidence provided consistent with the starting date of the project?</p> <p>If the project activity start date is prior to the validation is it discussed how the CDM was taken into account in the decision to go ahead with the project activity</p>	PDD Section B.5	/8a/ /12/	<p>the first turbine /8a/.</p> <p>CAR #03 was raised to address PP that the CDM consideration should be presented in accordance with the EB 41, Annex 49/ EB 48, Annex 61. With the information provided in the PDD version 1 (ref. 1a) it is not possible to confirm that real actions was taken to implement the project activity considering the CDM.</p> <p>To close out CAR #03, additional information was added in the PDD version 2 (ref. . SGS verified the documents related to the CDM consideration:</p> <p>-31/01/2007: Grupo Bertin discussed to verify the possibilities of the carbon credits benefits for the São Fernando project located in Dourados /12d/.</p> <p>-06/09/2007: Minutes of the Grupo Bertin's Board meeting specific for the São Fernando mill /12a/, considering that the project will be developed under CDM, pending to find a consultant for the CDM project.</p> <p>-October 2007: first proposal from ZeroEmissions to Sao Fernando project /12b/</p> <p>-12/11/2007: Starting date of the project activity /8a/</p> <p>-March 2008: revised proposal from ZeroEmissions to Sao Fernando project. /12bi/</p> <p>-August 2008: revised proposal from ZeroEmissions to Sao Fernando project. /12bii/</p> <p>-26/11/2008: Contract between Zero Emissions and Usina São Fernando Açúcar e Alcool Ltda /12c/</p> <p>-05/02/2009, 13/04/2009: proposals from SGS</p> <p>-13/04/2009: Signed contract with SGS</p> <p>-24/04/2009: PDD published for Global stakeholders consultation</p> <p>Through the evidences provided by PP, SGS concluded that the CDM consideration was presented according to EB 49 Annex 22.</p> <p>Thus, CAR #03 was closed out.</p>	YES
B.4.6. For an existing project activity with a start	EB 49, annex.22	DR	As specified in the EB49 Annex 22 about CDM consideration if <i>"there is less than 2 years of a gap between the documented evidence the DOE</i>	YES

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
date before 2 August 2008, for which the start date is prior to the date of publication of the PDD for global stakeholder consultation, is the real documented evidence for an assessment of real and continuing actions available for validation and is this evidence authentic?		/8/ /12/	<i>shall conclude that continuing and real actions were taken to secure CDM status for the project activity</i> ”, the DOE concludes that the evidences provided by the PP fulfil the requirements of continuing and real actions were taken in the project activity.  See section B.4.4 above and the references /8/ /12/ for details.	
B.4.7. If an investment analysis has been used, has it been demonstrated that the proposed project activity is economically or financially less attractive than at least one other alternative without the revenue from the sale of CERs?	VVM Para. 106, 107, 108, 109 112a-c PDD Section B.5	DR /9/ /11/	Yes. Refer to section B.4.2 above for details.	Y
B.4.8. If a benchmark is used, is it ensured that it is selected in accordance with the requirements of the tool /methodology and it represents standard returns in the market (not linked to the	VVM Para. 110 PDD Section B.5	DR /9/ /11/	Yes. Refer to section B.4.2 above for details.	YES

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
subjective profitability expectation or risk profile of a particular project developer).				
B.4.9. If a barrier analysis has been used have the 'guidelines for objective demonstration and assessment of barriers' been followed? Have all applicable steps been considered and substantiated with objective evidence?	VVM Para 113 EB 50 Annex 13	DR	Yes. Refer to section B.4.2 above for details. Step 2 of the Combined tool was applied and all applicable steps was considered and substantiated. All barriers presented does not prevent the proposed project activity and step 3 of the Combined tool was applied.	Yes
B.4.10. If a barrier analysis has been used, has it been shown that the proposed project activity faces barriers that prevent the implementation of this type of proposed project activity but would not have prevented the implementation of at least one of the alternatives?	VVM Para. 114 115a-b/116 PDD Section B.5	DR	Refer to section B.4.2 above for details. Step 2 of the Combined tool was applied and all applicable steps was considered and substantiated. All barriers presented does not prevent the proposed project activity and step 3 of the Combined tool was applied.	YES
B.4.11. Is the discussion on additionality consistent with the identification of all plausible and credible baseline scenarios?	VVM Para. 105 PDD Section B.5	DR /2/ /2b/	The PP presented all the scenarios as per the approved methodology (ref. 2) in the PDD concluding that the scenario #4 is in compliance with the description of the project activity.	YES
B.4.12. Do the identified baseline scenarios include	VVM Para. 105 PDD Section	DR	No, in the absence of the project activity no electricity would be generated.	YES

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
technologies and practices that include outputs or services comparable with the proposed CDM project activity? Do they also abide by the same applicable laws and legislations?	A.4.3/B.5	/13/	All the legislation applied is the same with the exception of the ANEEL authorizations /13a, b and c/ for exporting electricity to the Brazilian interconnected grid.	
B.4.13. Has it been shown that the project is not common practice?	VVM Para. 119a/b PDD Section B.5	DR /17a/	Yes, refer to section B.4.1 above.	YES
B.4.14. What are the key distinctions between the project activity and any similar projects that are widely used as common practice?	VVM Para. 118, 119c/d PDD Section B.5	DR /17a/	As demonstrated in the section B.4.1, the differences are the fact the project activity will export renewable electricity to the interconnected grid and the efficiency of generation per ton of bagasse (18.07%) is much higher than the average (2.86%), comparing with the state of Mato Grosso do Sul where the project is located. The conclusion is that there is no similar plant compared with proposed project activity.	YES
<b>B.5. Application of the Baseline Methodology</b>				
B.5.1. Has the approved methodology been applied correctly for determining <b>baseline emissions</b> ?	VVM Para. 91d PDD Section B (B.6.1 -B.7.1)	DR /2/	Yes, the ACM0006 version 10 was correctly applied.  Based in the methodology applied, the baseline emissions due to uncontrolled burning or decay of the biomass residues are zero ( $BE_{\text{biomass},y} = 0$ ), since the biomass residues would not decay or be burnt in the absence of the project activity.	YES

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
B.5.2. Has the approved methodology been applied correctly for determining <b>project emissions</b> ?	VVM Para. 90/91d PDD Section B (B.6.2-B.7.1)	DR /2/	<p>The formulae to calculate the project emissions is expressed below:</p> $PE_y = PET_y + PEFF_y + PE_{ECy} + GWP_{CH_4} \cdot (PE_{Biomass, CH_4, y} + PE_{ww, CH_4, y})$ <p><b>PET<sub>y</sub></b> = CO<sub>2</sub> emissions during the year y due to transport of the biomass residues to the project plant (tCO<sub>2</sub>/yr).</p> <p><b>PEFF<sub>y</sub></b> = CO<sub>2</sub> emissions during the year y due to fossil fuels co-fired by the generation facility or other fossil fuel consumption at the project site that is attributable to the project activity (tCO<sub>2</sub>/yr).</p> <p><b>PE<sub>EC,y</sub></b> = CO<sub>2</sub> emissions during the year y due to electricity consumption at the project site that is attributable to the project activity (tCO<sub>2</sub>/yr).</p> <p><b>GWP<sub>CH4</sub></b> = Global Warming Potential for methane valid for the relevant commitment period.</p> <p><b>PE<sub>BiomassCH4, y</sub></b> = CH<sub>4</sub> emissions from the combustion of biomass residues during the year y (tCH<sub>4</sub>/yr).</p> <p><b>PE<sub>ww,CH4,y</sub></b> = CH<sub>4</sub> emissions from wastewater generated from the treatment of biomass residues in year y (tCH<sub>4</sub>/yr).</p> <p>It was verified that there will be no emissions from:</p> <ul style="list-style-type: none"> <li>- transportation of biomass residues (PET<sub>y</sub> = 0);</li> <li>- electricity consumption of fossils fuels during the project activities (PEFF<sub>y</sub> = 0);</li> <li>- electricity demand of the projected plant will be satisfied with the bagasse electricity generation (PE<sub>EC,y</sub> = 0);</li> <li>- combustion of biomass residues (PE<sub>Biomass, CH4, y</sub> = 0); and</li> <li>- wastewater generated from the treatment of biomass (PE<sub>ww, CH4, y</sub> = 0).</li> </ul>	YES

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
			The desk review allowed the assessment team to conclude that project emissions are not applicable to the project activity.	
B.5.3. Has the approved methodology been applied correctly for determining <b>leakage</b> ?	VVM Para. 91d PDD Section B (B.6.2 -B.7.1)	DR /2/	Leakage is not applicable to the project activity because, as states in the methodology ACM0006 v. 10 page 48, " <i>the main potential source of leakage for this project activity is an increase in emissions from fossil fuel combustion or other sources due to the diversion of biomass residues from other uses to the project plant as a result of the project activity</i> " and this project activity does not combust fossil fuel and either apply biomass residues which would not be used for the same purpose.	YES
B.5.4. Where applicable, has the approved methodology been applied correctly for the <b>direct calculation of emission reductions</b> ?	VVM Para 88/91d PDD Section B (B.6.2 -B.7.1)	DR /2/	$ER_y = ER_{heat,y} + ER_{electricity,y} + BE_{biomass,y} - PE_y - L_y$ <p><b>ER<sub>y</sub></b> = Emissions reductions of the project activity during the year y (tCO<sub>2</sub>/yr).</p> <p><b>ER<sub>electricity,y</sub></b> = Emission reductions due to displacement of electricity during the year y (tCO<sub>2</sub>/yr).</p> <p><b>ER<sub>heat,y</sub></b> = Emission reductions due to displacement of heat during the year y (tCO<sub>2</sub>/yr)</p> <p><b>BE<sub>biomass,y</sub></b> = Baseline emissions due to natural decay or burning of anthropogenic sources of biomass residues during the year y (tCO<sub>2</sub>e/yr).</p> <p><b>PE<sub>y</sub></b> = Project emissions during the year y (tCO<sub>2</sub>/yr).</p> <p><b>L<sub>y</sub></b> = Leakage emissions during the year y (tCO<sub>2</sub>/yr).</p> <p><b>ER<sub>heat,y</sub></b> = 0 (because the thermal efficiency in the project plant is similar compared with the thermal efficiency of the reference plant considered in</p>	YES

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
			<p>the baseline scenario)</p> <p><math>BE_{\text{biomass},y} = 0</math> (see section B.5.1)</p> <p><math>PE_y = 0</math> (see section B.5.2)</p> <p><math>L_y = 0</math> (see section B.5.3)</p> <p>So, <math>ER_y = ER_{\text{electricity},y}</math></p> <p><math>ER_{\text{electricity},y} = EG_y \cdot EF_{\text{electricity},y}</math></p> <p><math>EG_y</math> = Net quantity of increased electricity generation as a result of the project activity (incremental to baseline generation) during the year <math>y</math> (MWh).</p> <p><math>EF_{\text{electricity},y}</math> = CO<sub>2</sub> emission factor for the electricity displaced due to the project activity during the year <math>y</math> (tCO<sub>2</sub>/MWh).</p> <p><math>EG_y = EG_{\text{project plant},y} - \epsilon_{\text{el, other plant}(s)} \cdot \frac{1}{3.6} \sum BF_{k,y} NCV_k</math></p> <p><math>EG_{\text{project plant},y}</math> = Net quantity of electricity generated in the project plant during the year <math>y</math> (MWh).</p> <p><math>\epsilon_{\text{el, other plant}(s)}</math> = Average net energy efficiency of electricity generation in (the) other power plant(s) that would use the biomass residues fired in the project plant in the absence of the project activity (MWh<sub>el</sub>/MWh<sub>biomass</sub>).</p> <p><math>BF_{k,y}</math> = Quantity of biomass residue type <math>k</math> combusted in the project plant during the year <math>y</math> (tons of dry matter or litre).</p> <p><math>NCV_k</math> = Net calorific value of the biomass residue type <math>k</math> (GJ/ton of dry matter or GJ/litre).</p>	



Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
			$EF_{grid,CM,y} = EF_{grid,OM,y} \times w_{OM} + EF_{grid,BM,y} \times w_{BM}$ <p><b>EF<sub>grid,BM,y</sub></b> = Build margin CO<sub>2</sub> emission factor in year y (tCO<sub>2</sub>/MWh).  <b>EF<sub>grid,OM,y</sub></b> = Operating margin CO<sub>2</sub> emission factor in year y (tCO<sub>2</sub>/MWh).  <b>w<sub>OM</sub></b> = Weighting of operating margin emissions factor (%).  <b>w<sub>BM</sub></b> = Weighting of build margin emissions factor (%).</p>	
B.5.5. Where there is an option between different equations or parameters, has the methodological choices for the project been explained, have they been properly justified and are they correct?	VVM Para.89/90/91 PDD Section B (B.6.2 -B.7.1)	DR /2/ /2c/	<p>Yes, PDD version 01 /1/ follows the methodology ACM0006 v.10, and formulas applicable to the scenario 4.</p> <p>For the emission factor calculation, PP used the DNA calculations that follows the “<i>Tool to calculate the emission factor for an electricity system</i>” (ref. 2c), option C (Dispatched data analysis), vintage data updated ex-post (option 2) /2c/.</p>	YES
B.5.6. Are uncertainties in the GHG emissions estimates properly addressed in the documentation?	PDD Sections B.5-C	DR /2/	<p>Yes. The uncertainties were taken into account as ACM0006 v.08 states. ACM0006 v.09 did not updated this matter. In the same way, ACM0006 v. 10 has not updated in this matter.</p>	YES
<b>B.6. Ex-ante Data and Parameters Used</b>				
B.6.1. Are the data provided in compliance with the methodology?	VVM Para. 91/67c PDD Section B.6.3/B.6.4	DR /2/	<p>See CAR#09 in the section B.10.1.</p> <p>Yes. The ex-ante parameters listed in the PDD are in compliance with methodology.</p>	YES
B.6.2. Is all the data derived from official data	VVM Para.	DR	<p>Yes. The parameter “Average net energy efficiency of electricity in the reference plant that would be constructed in the absence of the project</p>	YES

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
sources or replicable records and have these been correctly quoted?	91a/b PDD Section B.6.3/B.6.4	/17a/	activity” was calculated based on a National Report about the Profile of the Alcohol Sector in the year 2008 (CONAB) /17a/.	
B.6.3. Is the vintage of the baseline data correct?	PDD Section B.6.3/B.6.4	DR /17a/	Yes, data from official study from CONAB (National Company of Supply, from the Portuguese <i>Compahia Nacional de Abastecimento</i> ) was used.	YES
B.6.4. Is all the data appropriate and correctly applied to the CDM project activity?	VVM Para. 91c PDD Section B.6.3/B.6.4	DR /17a/	Yes. The data was correctly applied and in a conservative manner.	YES
B.6.5. Are data and parameters that are not being monitored and remained fixed throughout the crediting period appropriately assessed, correct, and will they result in conservative estimates?	VVM Para. 90 PDD Section B.6.3/B.6.4	DR /2/ /3/	There is no fixed data/parameter which will have influence in the emissions reductions during the crediting period.	YES
B.6.6. Is sampling approach used for any parameters?	EB 50 Annex 30 Para. 30	DR	There is no fixed data/parameter which will have influence in the emissions reductions during the crediting period.	Yes
B.6.7. Where applicable, the plant load factor shall be defined ex-ante in the CDM-PDD according to one of the following three options:  The plant load factor provided to banks and/or equity financiers while applying the project activity for project financing, or to	EB 48 Annex 11	DR	This project is a thermal power plant using biomass. The term “plant load factor” is not common in thermal plants (different from Hydro plants). The “load factor” in this case depends on the non availability of the plant like internal consumption and the project will monitor the net quantity of electricity generated during the year. The DOE has validated the Plant Load Factor (PLF) of the project activity through the Technical report prepared by the third party (engineering company) hired by the Project Proponent (Procknor, ref. 17b). The	Yes

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
the government while applying the project activity for implementation approval; The plant load factor determined by a third party contracted by the project participants (e.g. an engineering company)			determination of PLF was a part of the engineering project report. DOE has validated the PLF for the biomass energy plant and found inline to the requirement set in EB48 Annex 11 for reporting and validation of PLF which allow the determination of PLF by a third party contracted by the project participants. It is very well evident from the evidence provided (ref. 5, 16, 17b) that the calculated PLF is specific and appropriate to the project activity.	
<b>B.7. Calculation of Emissions Reductions</b>				
B.7.1. Has the approved methodology been applied correctly for determining <b>emission reductions</b> ?	VVM Para. 91d PDD Section A.4.4/B.6	DR /2/	Yes, methodology /2/ was correctly applied (see section B.5.4).	YES
B.7.2. Are the emission reduction calculations documented in a complete and transparent manner?	VVM Para. 91e PDD Section B.6	DR /2/ /3c/	The ER's are clearly calculated and expressed in the PDD version 01 /1/ following the scenario #4 of the ACM0006 v. 10.	YES
B.7.3. Is the projection based on same procedures as used for later monitoring or acceptable alternative models?	PDD Section B.6	DR /2/ /3c/ /17a/ /18a/	The data used to calculate the emissions is based on official or local data and the monitored parameters will replace them later for the ER calculation.  In the PDD version 1, section B.6.2, the PP presented parameters used to calculate the emission factor (EF <sub>grid</sub> ) and they shall be presented in the section B.7.1 of the PDD version 01 /1/, monitored parameters. CAR#04 was raised.  As the parameters used to calculate the emission factor from the grid were excluded from the section B.6.2 and included in the section B.7.1 of the PDD version 02 /1/. Also the source of the EF <sub>OM</sub> and EF <sub>BM</sub> and the calculation of the EF <sub>CM</sub> were done correctly. CAR#04 was closed out.	<del>CAR#04</del>  YES

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
B.7.4. Is the calculation of the emission reduction correct?	VVM Para. 91e PDD Section B.6	DR /16/	Yes. The ER's are correct and can be reproduced, as clearly demonstrated in the spreadsheet /16/.	YES
<b>B.8. Emission Reductions</b>				
B.8.1. Is the form/table required for the indication of projected emission reductions correctly applied?	PDD Section A.4.4/ Section B.6	DR /16/	Yes, the table is correctly applied in the section B.6.4 of the PDD v.01 /1/.	YES
B.8.2. Is the projection in line with the envisioned time schedule for the project's implementation and the indicated crediting period?	PDD Section A.4.4/ Section B.6	DR /16/	The projection starts on 01/06/2011 as well the starting date of the first crediting period (7 years).	YES
<b>B.9. Monitoring Methodology</b>				
B.9.1. Does the monitoring methodology provide a consistent approach in the context of all parameters to be monitored and further information provided by the PDD?  Are all parameters and data that are available at validation consistent with the approved methodology. Has this	VVM Para. 67e PDD Section B.7- B.8 see also Annex 4	DR /2/ /2c/	All the parameters that will be monitored are explained, consistent and in compliance with the methodology ACM0006 version 10 /2/.  See section B.10.1 below for more details about the monitored parameters.	YES

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
data been interpreted and applied correctly?				
B.9.2. Does the monitoring methodology apply consistently the choice of the option selected for monitoring both of project and baseline emissions?	PDD Sections B and C	DR /2/	See section B.9.1 and B.10.1.	YES
<b>B.10. Data and Parameters Monitored</b>				
B.10.1. Does the monitoring plan in the PDD comply with the approved methodology provided for the collection and archiving of all relevant data necessary for estimation or measuring the emission reductions within the project boundary during the crediting period?	VVM Para. 91a/91d/121/79 PDD Section B.7-B.7.2	DR /2/ /2c/	<p>CAR#09 was raised to address PP that the evidences for the reference plant and for the data/parameter used in the calculation needs to be provided. Regarding the ex-ante and monitored parameters:</p> <p>-EG project plant: it is not clear how this parameter will be monitored. Moreover, there is no value of data applied for purpose of calculated expected emission reductions in section B.5</p> <p>About the monitoring of EGy, the PP states that “<i>Data will be measured in electricity meters devices and the monitoring will be done according to standards and monitoring patterns of the CCEE</i>”.</p> <p>-BFk,y: it is not clear how PP will monitor this parameter. Moreover according to the methodology ACM0006 “<i>if the amount of biomass combusted is estimated from the amount of biomass delivered to the project site, a procedure should be established to undertake an energy balance for the verification period, considering the stocks of biomass at the beginning and end of each verification period</i>”, however it is not clear how the requirements of the methodology will be meet.</p> <p>To clarify, the PP stated that “<i>The total bagasse consumed in the facility is based on the total sugarcane crushed and the percent amount of bagasse in the sugarcane. Trucks carrying the sugarcane will be weighted (loaded and empty) in a weight bridge located at the entrance</i>”.</p>	<p><del>CAR#09</del></p> <p>YES</p>

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
			<p><i>of the plant. Samples of the sugarcane carried by each truck will be analyzed and the percentage of fiber in the cane will be calculated. The quantity of fiber in a specific amount of sugarcane is the same as the bagasse proceeding from it; therefore, the quantity of bagasse available for cogeneration is directly proportional to the sugarcane produced. Data will be adjusted for the moisture content in order to determine the quantity of dry biomass. The quantity will be crosschecked with the quantity of electricity (and heat) generated. Data will be recorded on a working day basis by the Technical department and archived in electronic spreadsheet</i></p> <p>-NCV<sub>k</sub>: QA/QC procedure described in the section B.7.1 is not according to the required by the methodology. Also the evidences for the calculation of the bagasse NCV used in the reference plant and the one used in the project activity to calculate the efficiency of the plants need to be provided.</p> <p>To clarify, the PP stated that “<i>regarding the QA/QC procedure, the methodology asks for checking the consistency of the measurements by comparing the measurement results with measurements from previous years, relevant data sources and default values by the IPCC.</i>”</p> <p>The PP will compare the NCV<sub>k</sub> with data from IPCC since there is no historical measurement and , the ex-ante values of <b>NCV<sub>k</sub></b> for the estimation of ER was evidenced (Ref.18a) and the source of the values 19.42 checked.</p> <p>-Moisture content of the biomass residues: the monitoring frequency required by the methodology is continuously, mean values calculated at least annually. This requirement is not met in the monitoring plan of the PDD version 1.</p> <p>To clarify, the PP stated that “<i>according to the methodology, moisture content of biomass residue will be continuously monitored, which means that values will be calculated at least annually. Samples will be determined on site by the internal laboratory</i>”. The</p>	

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
			<p>ex-ante value of <i>Moisture content</i> applied by the PP for the estimation of ER was evidenced (Ref.18a) and the source of the value 48% checked.</p> <p>The monitored parameters presented in the PDD version 2 section B.7.1, including their monitoring frequency and QA/QC procedures, are in accordance with the methodology ACM0006 version 10 applied by the PP.</p> <p>The CAR#09 was closed out.</p>	
B.10.2. Are the choices of project GHG indicators reasonable and in conformance with the requirements set by the approved methodology applied?	PDD Section B.7-B.7.2/B.6.2	DR /2/ /2c/	Yes. See section B.10.1 above.	YES
B.10.3. Will it be possible to determine the specified project GHG indicators?	PDD Section B.6.2-B.8	DR /2/ /2c/	All the monitored parameters necessary to fulfill the requirements of the methodology were identified in the section B.7.1 of the PDD.	YES
B.10.4. Is the information given for each monitoring variable by the presented table sufficient to ensure the verification of a proper implementation of the monitoring plan?	PDD Section B.6.2-B.7.1	DR /2/ /2c/	Yes. See section B.10.1 and B.10.3 above.	YES
B.10.5. Is the information given for each monitoring variable by the presented table sufficient to ensure the delivery of high quality data free of	PDD Section B.6.2-B.7.1	DR /2/ /2c/	Yes. See section B.10.1 and B.10.3 above.	YES



Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
potential for biases or intended or unintended changes in data records?				
B.10.6. Is the monitoring approach in line with current good practice, i.e. will it deliver data in a reliable and reasonably acceptable accuracy?	PDD Section B.5-B.7.2	DR /2/ /2c/	Yes. See section B.10.1 and B.10.3 above. Expected that the monitoring plan will deliver an acceptable accuracy.	YES
B.10.7. Are all formulae used to determine project emission clearly indicated and in compliance with the monitoring methodology.	PDD Section B.6.2-B.7.1	DR /2/ /2c/	There are no project emissions and leakage according to the scenario #4 of the ACM0006 applied.	YES
<b>B.11. Quality Control (QC) and Quality Assurance (QA) Procedures</b>				
B.11.1. Is the selection of data undergoing quality control and quality assurance procedures complete?	VVM Para. 121 Refer to all data within the PDD Inc. B.6.2-B.7.1	DR /2/ /2c/	<p>The QC/QA procedures for each parameter is:</p> <p><b>EG<sub>y</sub></b> The consistency of metered net electricity generation will be cross-checked with receipts from electricity sales (if available, since there will be sale receipts only for the power exported to the grid, not for the whole power generation of the plant).</p> <p><b>EF<sub>BM, OM, CM</sub></b> Since this is a public data calculated and given by the Brazilian DNA, no QA/QC procedures will be applied.</p> <p><b>BF<sub>K,y</sub></b> Measurements will be cross-checked with an annual energy balance that is based on purchased quantities (if possible) and stock changes.</p>	FAR#10

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
			<p><b>Moisture content of the biomass residues</b></p> <p>Moisture content of biomass residue will be continuously monitored. Mean values will be calculated at least annually.</p> <p><b>NCV<sub>k</sub></b></p> <p>Since there are no NCV measurements from previous years, the consistency of the measurements will be checked by comparing the measurement results with default values by the IPCC.</p> <p>The QC/QA proposed by the PP for the parameters cited above are in compliance with the methodology ACM0006 version 10, but as the project is not implemented yet, it is requested to the PP to provide before verification the procedures implemented to guarantee that the project will follow the required by methodology in order to assure the delivery of high quality data, including procedures for calibration of the equipments, day-to-day records handling, data storage, internal audits of GHG project, project performance reviews before data is submitted for verification, dealing with possible monitoring data adjustments and missing data allowing redundant reconstruction of data in case of monitoring problems.</p> <p>FAR#10 was raised.</p>	
B.11.2. Is the belonging determination of uncertainty levels done correctly for each ID in a correct and reliable manner?	Refer to all data within the PDD Inc. B.4/B.7.2/Annex 4	DR /2/ /2c/	Yes. See sections B.10.1 and B.11.1 above.	YES
B.11.3. Are quality control procedures and quality assurance procedures sufficiently described to ensure the delivery of high quality data?	VVM Para 121	DR /2/ /2c/	Yes. See sections B.10.1 and B.11.1 above.	YES

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
B.11.4. Is it ensured that data will be bound to national or internal reference standards?	VVM Para. 86d	DR /2/ /2c/	Yes. See sections B.10.1 and B.11.1 above.	YES
B.11.5. Is it ensured that data provisions will be free of potential conflicts of interests resulting in a tendency of overestimating emission reductions?	VVM Para. 19	DR /2/ /2c/	Yes. See sections B.10.1 and B.11.1 above.	YES
<b>B.12. Operational and Management Structure</b>				
B.12.1. Is the authority and responsibility of project management clearly described?	PDD Section B.8/Annex 1	DR /21a/	Refer to FAR #10, section B.11.1. São Fernando plant will also organise the staff training in the appropriate monitoring, measurement and reporting techniques. The responsible for the cogeneration unit of the plant will also be the person in charge for organising the staff training.	YES
B.12.2. Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described?	PDD Section B.8/Annex 1	DR /21a/	The General Manager of Usina São Fernando is the responsible for the project activity. Zeroemissions is responsible for the Quality Assurance. Technical department is responsible for management/ data collection, laboratory is responsible for the measurements of the moisture content and net calorific value of the bagasse. Financial department is responsible for the verification/ invoices collection.  The monitoring plan structure is presented in the PDD.	YES
B.12.3 Are procedures identified for training of monitoring personnel?	PDD Section B.8/Annex 1	DR /21b/	See B.12.1.	YES
<b>B.13 Monitoring Plan (Annex 4)</b>				
B.13.1. Is the monitoring plan developed in a project specific manner clearly	VVM Para. 122a	DR /2/	See FAR#10, section B.11.1 above.	YES

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
addressing the unique features of the CDM activity?		/2c/		
B.13.2. Does the monitoring plan completely describe all measures to be implemented for monitoring all parameter required, including measures to be implemented for ensuring data quality?	VVM Para. 122b	DR /2/ /2c/	See FAR#10, section B.11.1 above.	YES
B.13.3. Does the monitoring plan provide information on monitoring equipment and respective positioning in order to safeguard a proper installation?	VVM Para. 122b	DR /2/ /2c/	See FAR#10, section B.11.1 above.	YES
B.13.4. Are procedures identified for calibration of monitoring equipment?	VVM Para. 122a-c	DR /2/ /2c/	See FAR#10, section B.11.1 above.	YES
B.13.5. Are procedures identified for maintenance of monitoring equipment and installations?	VVM Para. 122a-c	DR /2/ /2c/	See FAR#10, section B.11.1 above.	YES
B.13.6 Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance	VVM Para. 122a-c	DR /2/ /2c/	See FAR#10, section B.11.1 above.	YES

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
documentation)				
B.13.7. Are procedures identified for dealing with possible monitoring data adjustments and missing data allowing redundant reconstruction of data in case of monitoring problems?	VVM Para. 122a-c	DR /2/ /2c/	See FAR#10, section B.11.1 above.	YES
B.13.8. Are procedures identified for internal audits of GHG project compliance with operational requirements where applicable?	VVM Para.122a-c	DR /2/ /2c/	See FAR#10, section B.11.1 above.	YES
B.13.9. Are procedures identified for project performance reviews before data is submitted for verification, internally or externally?	VVM Para. 122a-c	DR /2/ /2c/	See FAR#10, section B.11.1 above.	YES
B.13.10. Describe the ability of the project participants to implement the monitoring plan.	VVM Para. 122c	DR /2/ /2c/	See FAR#10, section B.11.1 above.	YES
<b>B.14. Baseline Details</b>				
B.12.2. Is there any indication of a date when determining the baseline?	PDD Section B.8/Annex 3	DR	Yes, according to the PDD version 1, the bsaseline was determined on 15/03/2009 and updated in the PDD version 2 (24/08/2009).	YES
B.12.3. Is this consistent with the time line of the PDD history?	Also see revision history of the PDD	DR	Yes.	YES

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
B.12.4. Is all data required provided in a complete manner by annex 3 of the PDD?	PDD Annex 3	DR	No information presented in the Annex 3.	YES
B.12.5. What is the documented crediting period of the project? Is this inline with available data?		DR	Renewable crediting period (01/06/2011, or on the registration date of the project activity, whichever is later).	Yes
B.12.6. In cases where the methodology specifies, has the ' <i>Tool to determine the remaining lifetime of equipment</i> ' been correctly applied?		DR	The approved methodology ACM0006 (ref. 2) does not require the use of the Tool.	Yes
<p>B.12.7. In cases where the '<i>Tool to determine the remaining lifetime of equipment</i>' has been used the project participants may use one of the following options to determine the remaining lifetime of the equipment:</p> <p>(a) Use manufacturer's information on the technical lifetime of equipment and compare to the date of first commissioning;</p> <p>(b) Obtain an expert evaluation;</p>	EB 50 Annex 15	DR	The Tool is not required, however the PP stated in the section C.1 of the PDD version 01, that the operational lifetime of the project activity is 20 years, which was the technical lifetime of the steam turbine (ref. 8b) and the DOE considered it as valid and conservative due to the fact the "Tool to determine the remaining lifetime of equipment" version 01 (ref. 2d) released in the EB50 Annex 15, states a default value for technical lifetime of 25 years for this kind of equipment	Yes

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
(c) Use default values.				
<b>C. Duration of the Project / Crediting Period</b>				
C.1.1. Are the project's starting date and operational lifetime clearly defined and reasonable?	VVM Para. 102a-c PDD Section C.1.1/C.1.2	DR /8a/ /14b/	CAR #05 was raised. According the PDD guidelines, the starting date of a CDM project activity is the earliest of the date(s) on which the implementation or construction or real action of a project activity begins/has begun. To close out CAR #05, PDD was revised to present the project starting date according to the required by EB 41. The starting date of 12/11/2007 corresponds to the date of the purchase of the first turbine /8a/. CAR #05 was closed out. Regarding the operational lifetime, verified in the technical evaluation of the equipment report that the minimum lifetime of the boiler is 20 years /14b/.	<del>CAR #5</del>  YES
C.1.2. Is the assumed crediting time clearly defined and reasonable (renewable crediting period of max 7 years with potential for 2 renewals or fixed crediting period of max. 10 years)?	VVM Para. 102a PDD Section C.2/C.2.1/C.2.2	DR	Renewable crediting period (7 years).	YES
C.1.3. Does the project's operational lifetime exceed the crediting period	VVM Para. 102a PDD Section C.1.2/C.2.1.1/C.2.1.2	DR	Yes, the operational life time exceeds the first crediting period.	YES
C.1.4. Does the start date indicate whether this is a new project activity or a pre-existing project activity?	VVM Para. 102a/ 98 PDD Section C.1.1/C.2.1.1	DR	This is a new project activity. The starting date is 12/11/2007.	YES

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
<b>D. Environmental Impacts</b>				
D.1.1. Does the project comply with environmental legislation in the host country?	VVM Para. 131 PDD section D	DR	Yes, verified the environmental licenses for the project. Refer to data below.	YES
D.1.2. Has an analysis of the environmental impacts of the project activity been sufficiently described?	VVM Para. 131 PDD section D	DR /15/	The environmental aspects of the project activity were analyzed by the Environmental Agencies.  Verified the installation license nº 129/2008, issued by IMASUL on 22/12/2008 /15/. Also verified the protocol sent to the environmental agency in order to get the Operation License /15/.	YES
D.1.3. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	VVM Para. 131 PDD section D	DR	The environmental aspects of the project activity were analyzed by the Environmental Agencies.	YES
D.1.4. Will the project create any adverse environmental effects?	VVM Para. 131 PDD section D	DR	Refer to section D.1.2. Adverse environmental effects were considered by the environmental agency when issuing the applicable licenses.	YES
D.1.5. Are trans-boundary environmental impacts considered in the analysis?	VVM Para. 131 PDD section D	DR	Refer to section D.1.2. Transboundary impacts were considered by the environmental agency.	YES
D.1.6. Have identified environmental impacts been addressed in the project design?	VVM Para. 131 PDD section D	DR	Refer to section D.1.2. Environmental impacts were analyzed by environmental agency.	YES
<b>E. Stakeholder Comments</b>				
E.1.1. Have relevant	VVM Para.	DR	Regarding the local stakeholders consultation, Resolution number 7 of	<del>CAR#12</del>



Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
stakeholders been consulted?	128a PDD Section E.1	/19/ /20/ /20a/ /20b/ /20c/	<p>the Brazilian DNA, establishes that the PP shall “<i>It – inform the specific electronic address for the web site where copies can be obtained, in Portuguese, of the last available version of the project design document in question, as well as the description of the project activity’s contribution under the Clean Development Mechanism towards sustainable development, as per Annex III of Resolution no. 1 of this Commission, guaranteeing this site will remain accessible at least until conclusion of the project activity registration process by the CDM Executive Board</i>”.</p> <p>Verified that this requirement was not meet. PDD was not available in Portuguese. CAR #12 was raised.</p> <p>Verified that the PP sent the PDD in Portuguese /20/ through email to Sugarcane Technology Centre (CTC) /20c/. CAR #12 was closed out.</p> <p>The following stakeholders were contacted. Verified the ARs /20b/ :</p> <ul style="list-style-type: none"> <li>-Dourados City Council</li> <li>-Dourados Municipal Chamber</li> <li>-Public Ministry of the State of Mato Grosso do Sul</li> <li>-Environmental Secretary (SEMAC)</li> <li>-Public Federal Ministry (Procuradoria MS)</li> <li>-Union of the Sugar and Alcohol Industry of the State of Mato Grosso do Sul</li> <li>-Institute of Environment of Mato Grosso do Sul (IMASUL)</li> <li>-UDOP – Bioenergy Producers Association</li> <li>-UNICA – Sugarcane Industry Association</li> <li>-CTC – Sugarcane Technology Centre</li> <li>-Brazilian Forum of NGOs and Social Movements for Environment and Development – FOBMS</li> </ul>	YES
E.1.2. Have appropriate media been used to invite	VVM Para.	DR	Letters /20a/ were sent in Portuguese and also, the PDD was made available in local language (Refer to CAR #12).	YES

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
comments by local stakeholders?	128a PDD Section E.1	/20a/		
E.1.3. Is the undertaken stakeholder process described in a complete and transparent manner?	VVM Para. 128b PDD Section E.1	DR	The stakeholder consultation followed the Brazilian DNA resolution number 7, 05 March 2008.	YES
E.1.4. Is a summary of the stakeholder comments received provided?	VVM Para. 128b PDD Section E.2	DR /20c/	Yes, the Sugarcane Technology Centre (CTC) asked for more information about any CDM projects developed by companies associated to the institution /20c/.	YES
E.1.5. Has due account been taken of any stakeholder comments received?	VVM Para. 128b PDD Section E.3	DR /20/ /20c/	Yes, PP sent an email to CTC /20c/ with the PDD in Portuguese /20/	YES

## References

Ref. ID	Title/Description	Comment
1a	PDD version 01	Dated 31 <sup>st</sup> March 2009
1b	PDD version 02	Dated 24 <sup>th</sup> August 2009
1c	PDD version 03	Dated 6 <sup>th</sup> June 2010
1d	PDD version 04	Dated 21 <sup>st</sup> September 2010
2	Methodology ACM0006 version 10	Approved consolidated baseline and monitoring methodology ACM0006 "Consolidated methodology for electricity generation from biomass residues in power and heat plants",
2a	Combined Tool v 2.2	Combined tool to identify the baseline scenario and demonstrate additionality (version 02.2), valid from 26/08/2008
2b	Tool of additionality v 5.2	Tool for the demonstration and assessment of additionality (version 05.2)
2c	Tool to calculate the EF v 1.1	Tool to calculate the emission factor for an electricity system (version 01.1)
2d	Tool to determine the remaining lifetime of equipment (version 01)	Tool to determine the remaining lifetime of equipment (version 01)
3a	LoA	LoA
3b	MoC	MoC
4a	Power Purchase Agreement with CCEE	CCEE means Chamber of Commerce of Electricity Energy and is a governmental company responsible for the electricity commercialization.
4b	Auction prices result	For the years 2010-12
4c	Energy purchase proposal	Dated 2 <sup>nd</sup> March 2009
4d	Auction conditions	Edital nº 01/2008 ANEEL
4e	Energy sale communications	Between 2 <sup>nd</sup> February and 02 March 2009
5	Production estimatives (5 yrs)	Internal document
6	USF_Operating Expenses, 2007	USF_Operating Expenses, 2007
7	Insurance contract	Insurance contract
8a	Turbine purchase contract	Turbine purchase contract

8b	Turbine technical specification	Turbine technical specification
9	USF_Financial Analysis_ver.02 (2007)	USF_Financial Analysis_ver.02 (2007)
10a	BNDES loan contract	Signed on 03 February 2009
10b	Cash Flow (loan contract)	Cash Flow (loan contract)
11	WACC 2007	Folder containing spreadsheet with WACC calculation and examples of other companies.
12a	Minutes meeting Sept.2007	CDM consideration step 0
12b	Zeroemissions proposal (Oct.2007)	Zeroemissions proposal (Oct.2007)
12bi	Zeroemissions proposal (March.2008)	Zeroemissions proposal (March.2008)
12bii	Zeroemissions proposal (Aug.2008)	Zeroemissions proposal (Aug.2008)
12c	Zeroemissions CDM contract	Signed on 26 November 2008
12d	Minutes meeting CDM_31 01 07	Minutes meeting CDM_31 01 07
13a	Despacho ANEEL	Authorization for electricity Generation, dated 02 May 2008
13b	Portaria ANEEL	Authorization for Usina São Fernando to be a Independent Energy Producer (PIE), dated 20 February 2008
13c	Technical Info sent to ANEEL	Technical Info sent to ANEEL
14a	Boiler purchase contract	Boiler purchase contract
14b	Technical evaluation of the equipment (boiler)	Technical evaluation of the equipment (boiler)
14c	Generator commercial proposal	Generator commercial proposal
14d	Generator inspection	Generator inspection
15	Environmental Licenses	License of Construction and the application for the Operating License
16	UsinaSão Fernando_CER Calculation_ver.02	UsinaSão Fernando CER Calculation_ver.02
17a	CONAB-Perfil Setor Sucroalcooleiro 2008	Found at <a href="http://www.conab.gov.br/conabweb/download/safra/perfil.pdf">www.conab.gov.br/conabweb/download/safra/perfil.pdf</a> on 25/08/2009
17b	Procknor Engineer	Procknor Engineer
18a	NCV determination procedure	NCV determination procedure

18b	Pol, Brix, fiber and humidity procedure	Pol, Brix, fiber and humidity procedure
19	Usina São Fernando – Confirmation Receipts from Local Consultation	Usina São Fernando – Confirmation Receipts from Local Consultation
20	PDD_Sao Fernando_ver.01 _português	For local stakeholders consultation
20a	USF - Carta stakeholders	USF - Carta stakeholders
20b	ARs stakeholders SFBC Project	ARs stakeholders SFBC Project
20c	Stakeholder contact	Stakeholder contact
21a	USF_Responsável Projeto MDL	CDM project Management Responsibility procedure
21b	USF_Formação monitoramento	CDM project Training Responsibility procedure
22	Resolution nº 1 - DNA	Approved by the Brazilian DNA on 11 <sup>th</sup> September 2003 and can be found at <a href="http://www.mct.gov.br/upd_blob/0023/23433.pdf">http://www.mct.gov.br/upd_blob/0023/23433.pdf</a> , last access on 20/10/2009.
23	2008 Brazilian sugarcane harvest	2008 Brazilian sugarcane harvest
24	UNICA - Industry Union of Sugarcane	UNICA - União da Indústria de Cana-de-açúcar
25	National Agroenergy Plan / 2006-2011	Plano Nacional de Agroenergia
26	Selic Rate	Taxa Selic
27	Cost of Debit	Cost of Debit CI - 32
28	Debit Equity	Debit Equity CI - 26
29	Taxes evidence	Taxes evidence

### A.3 Annex 3: Overview of Findings

#### Findings Overview Summary

	CARs	CLs	FARs
Total Number raised	08	03	01

Date:	20/04/2009	Raised by:	Fabian Gonçalves		
Type:	CL	Number:	01	Reference:	B.4.2 – Annex 2
<b>Lead Assessor Comment:</b>					
<p>PDD version 1, section B.4, step 3 investment analysis:  The project is using the SELIC rate as a benchmark. The last eight months (August 2008 – March 2009) was used for the comparison and the last value of 12.66% was adopted in the analysis.  The period is not in accordance with PDD chronology. The proposed starting date is 12/11/2007.  According to the Combined Tool the input values used in the investment analysis should be valid and applicable at the time of the investment decision taken by the project participant and not information available at an earlier or later point.</p>					
<b>Project Participant Response:</b>				<b>Date:</b> 25/05/2009	
<p><i>The first serious consideration of São Fernando project took place on the Grupo Bertin's Board meeting at the beginning of September 2007 and the first real action of the project activity was the purchase of the first turbine on 12/11/2007.</i></p> <p><i>The investment decision was taken during 2007 (before the purchase of the turbine). Therefore, the investment analysis was also done in that period and Grupo Bertin used its own Weight Average Cost of Capital (WACC) to decide whether to carry out the project.</i></p> <p><i>Due to the strong variability of the SELIC tax during the last years (SELIC values can be consulted on <a href="http://www.portalbrasil.net/indices_selic.htm">www.portalbrasil.net/indices_selic.htm</a>) and the difficulty for determining which range of time would be the most suitable in order to establish a proper average value of SELIC as a benchmark, project participants have decided to reject the use of the SELIC tax as a benchmark for the investment analysis.</i></p> <p><i>In order to follow the correct PDD chronology, project participants will use as a benchmark the company's WACC, which is the minimum return rate expected by Grupo Bertin in its investments. As said before, this was the benchmark that Grupo Bertin used for taking the investment decision of the São Fernando project.</i></p> <p><i>Therefore, the IRR of the project (with and without CDM benefits) has been compared with the company's WACC. At the time of the investment decision, which is 2007, the benchmark of Grupo Bertin for this type of investment was 15.82%.</i></p> <p><i>The same value of WACC was used for a similar project developed in the same period, which is the construction of a new bagasse fired cogeneration plant (known as Biolins plant) in the municipality of Lins, in the state of São Paulo. Therefore, this is the most suitable benchmark for the company in order to decide about this kind of investments.</i></p>					
<b>Documentation Provided by Project Participant:</b>					
<ul style="list-style-type: none"> <li>- First turbine's purchase agreement, dated on 12/11/2007.</li> <li>- Minutes of the Grupo Bertin's Board meeting at the beginning of September 2007.</li> <li>- Calculation of the company's Weight Average Cost of Capital (WACC).</li> <li>- Financial analysis of Biolins Biomass Cogeneration Project; a similar project from Grupo Bertin which used the same benchmark as São Fernando Project.</li> </ul>					
<b>Information Verified by Lead Assessor:</b>					
<p>It was verified the evidences above which were named, respectively, as:  Ref.8a - Turbine purchase contract  Ref.12a - Minutes meeting Sept.2007  Ref.9 - USF_Financial Analysis_ver.02  Ref.11 - WACC 2007</p>					
<b>Reasoning for not Acceptance or Acceptance and Close Out:</b>					

06/10/2009 – Leandro Silva and Fabian Goncalves  
Based on the Financial Expert analysis it was possible to check that the documentation provided by the PP reached the requirements of the “Guidance on the Assessment of Investment Analysis” (EB41 Annex 45). The PP calculated the Weight Average Cost of Capital – WACC used by the Group Bertin and the benchmark is 15.82% for the period of the starting date of the project activity /11/. Additionally Grupo Bertin CDM Department also compared the project IRR without CDM revenues against the 16.49% rate used as a reference in Brazil as risk free rate (SELIC, ref. 26). This SELIC is the average from the last 3 years before the decision making. CL#01 was closed out.

<b>Acceptance and Close out by Lead Assessor:</b>	<b>Date:</b> 06/10/2009
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<b>Date:</b>	20/04/2009	<b>Raised by:</b>	Fabian Gonçalves
<b>Type:</b>	CAR	<b>Number:</b>	02
		<b>Reference:</b>	B.4.2 – Annex 2

**Lead Assessor Comment:**

The objective of the sensitivity analysis is to determine in which scenarios the project would pass the benchmark or become more favorable than the alternative.  
The sensitivity analysis presented in PDD version 1 does not follow the requirements of the Combined Tool. The initial investment cost that constitute more than 20% of total project cost and energy that represents the main revenue were not analyzed in the sensitivity.  
With the result of the sensitivity analysis it is not possible to conclude that project is not financially attractive since in some items the IRR pass the project IRR.

<b>Project Participant Response:</b>	<b>Date:</b> 25/05/2009
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*According to the “Guidance on the Assessment of Investment Analysis”, the ultimate objective of the sensitivity analysis is to determine the likelihood of the occurrence of a scenario other than the scenario presented, in order to provide a cross-check on the suitability of the assumptions used in the development of the investment analysis. Therefore, the parameters and the range of fluctuation of the sensitivity analysis have to be chosen considering realistic situations. The same Guidance also recommends using only input values valid and applicable at the time of the investment decision taken by the project participant. The use of investment analysis to demonstrate additionality is intended to assess whether or not a reasonable investor would or not decide to proceed with a particular project activity without the benefits of the CDM. This decision will therefore be based on the relevant information available at the time of the investment decision and not information available at an earlier or later point.*

*Since the investments in Property, Plant and Equipment (PP&E) are an important part of the project total cost, they will be included in the sensitivity analysis.*

*Although the electricity price is a meaningful parameter of the investment analysis, it can not be considered as parameter likely to fluctuate since the company has already signed a 15 year Power Purchase Agreement (PPA) starting at 2010, with a fix price of 156 R\$/MWh. The PPA of São Fernando plant has been signed with the Brazilian Government, and there is not any possibility of variation of the electricity price for the following 15 years. Therefore, any alternative financial scenario considering the fluctuation of the power price would not be realistic. For the electricity price on 2009, since the company did not have any PPA at the moment of the financial analysis, it has been assumed a value of 120 R\$/MWh, which is the price of the proposal of purchase from the free market that the company has.*

*Since the financial analysis was performed at the same time that the investment decision was taken, which is 2007, the estimations of power surplus for sale considered in the financial analysis correspond to the more optimistic calculations taken from the engineering study that project owners ordered prior to the project implementation in order to ensure the technical feasibility of the project. This report was carried out by a Brazilian engineering company with 15 years of recognised experience in the sugarcane processing sector. According to the engineering report, the sugarcane plant would not achieve its top production of sugarcane (4,000,000 tones and 50.150 hectares) until 2017.*

*Therefore, the sensitivity analysis has been made by altering the parameters that are considered as likely to fluctuate over time. These are the following ones:*

- Investments in Property, Plant and Equipment (PP&E).
- Operation Costs.
- General & Administrative Expenses.
- Energy Output.



<b>Documentation Provided by Project Participant:</b>					
<ul style="list-style-type: none"> <li>- Updated version of the sensitivity analysis, including the investments in PP&amp;E as a variable parameter.</li> <li>- 120 R\$/MWh proposal of power purchase from the free market.</li> <li>- 156 R\$/MWh Power Purchase Agreement with the Brazilian Government.</li> <li>- Power generation estimations, according to the engineering studies carried out prior to the project implementation, in order to discuss the project feasibility.</li> </ul>					
<b>Information Verified by Lead Assessor:</b>					
It was verified the evidences above which were named, respectively, as: Ref.9 - USF_Financial Analysis_ver.02 Ref.4c - Energy purchase proposal Ref.4a - Power Purchase Agreement with CCEE Ref.5 - Production estimative (5 yrs) Ref.16 - Usina São Fernando CER Calculation ver.02					
<b>Reasoning for not Acceptance or Acceptance and Close Out:</b>					
06/10/2009 – Leandro Silva and Fabian Goncalves After considering, from the client inputs, the IRR – Internal Rate of Return is approximately 10.63% reaching the NPV – Net Present Value of about (BRL 35.9 million) – negative when utilizing the benchmark rate of 15.82%. Taking into account the above items and the fact the PP started to use the “Combined tool”, version 2.2, the DOE concludes the project is unfeasible. CAR#02 was closed out.					
<b>Acceptance and Close out by Lead Assessor:</b>				<b>Date:</b> 06/10/2009	

Date:	20/04/2009	Raised by:	Fabian Gonçalves		
Type:	CAR	Number:	03	Reference:	B.4.4 – Annex 2

<b>Lead Assessor Comment:</b>					
The CDM consideration should be presented according to EB41 Annex 46. With the information provided in the PDD version 1 it is not possible to confirm that real actions was taken to implement the project activity considering the CDM.					
<b>Project Participant Response:</b>				<b>Date:</b> 25/05/2009	
According to Guidance on the Demonstration and Assessment of Prior Consideration of the CDM, proposed project activities with a start date before 2 August 2008, for which the start date is prior to the date of publication of the PDD for global stakeholder consultation, are required to demonstrate that the CDM was seriously considered in the decision to implement the project activity. Such demonstration requires the following elements to be satisfied:					
<p>(a) The project participant must indicate awareness of the CDM prior to the project activity start date, and that the benefits of the CDM were a decisive factor in the decision to proceed with the project. Evidence to support this would include, inter alia, minutes and/or notes related to the consideration of the decision by the Board of Directors, or equivalent, of the project participant, to undertake the project as a CDM project activity</p> <p>(b) The project participant must indicate, by means of reliable evidence, that continuing and real actions were taken to secure CDM status for the project in parallel with its implementation. Evidence to support this should include, inter alia, contracts with consultants for CDM/PDD/methodology services, Emission Reduction Purchase Agreements or other documentation related to the sale of the potential CERs (including correspondence with multilateral financial institutions or carbon funds), evidence of agreements or negotiations with a DOE for validation services, submission of a new methodology to the CDM Executive Board, publication in newspaper, interviews with DNA, earlier correspondence on the project with the DNA or the UNFCCC secretariat.</p>					
In the case of the project activity, the proposed starting date is 12/11/2007, which is the date of purchase of the first turbine. There are some evidences of the early consideration of the CDM for the São Fernando Project:					
<ul style="list-style-type: none"> <li>• Reference to the CDM mechanism included in the minutes of the Grupo Bertin's Board meeting on September 2007, where it is agreed that the company would look for consultants in order to carry out the CDM development.</li> </ul>					



- Grupo Bertin created a CDM Department in order to study the different possibilities of including its investments into the Clean Development Mechanism. This department already studied the CDM consideration of the São Fernando project at the beginning of 2007.
- Three different proposals from Zeroemissions Technologies (PDD consultant) in which the company offers its consultancy services for developing the CDM project for São Fernando Cogeneration Plant. These three offers are dated respectively on October 2007, March 2008 and August 2008.

**Documentation Provided by Project Participant:**

- Minutes of Grupo Bertin's Board meeting on September 2007, where it is agreed that the company would look for consultants in order to carry out the CDM development.
- Minutes of Grupo Bertin's CDM Department meeting on January 2007, where they discussed the different possibilities for CDM projects in the investments of the company. São Fernando project is one of these possibilities.
- Three different offers from Zeroemissions Technologies (PDD consultant) for the development of São Fernando Biomass Cogeneration Project. These offers are dated on: October 2007, March 2008 and August 2008, respectively.

**Information Verified by Lead Assessor:**

It was verified the evidences above which were named, respectively, as:

Ref.8a - Turbine purchase contract  
Ref.12a - Minutes meeting Sept.2007  
Ref.12b - Zeroemissions proposal (Oct.2007)  
Ref.12bi - Zeroemissions proposal (March.2008)  
Ref.12bii - Zeroemissions proposal (Aug.2008)  
Ref.12c - Zeroemissions CDM Contract  
Ref.12d - Minutes meeting CDM\_31 01 07  
Ref.1 - PDD version 2

**Reasoning for not Acceptance or Acceptance and Close Out:**

28/09/2009 – Leandro Silva and Fabian Goncalves

The project activity's starting date is 12/11/2007, which is the date of purchase of the first turbine (Ref.8a). For the consideration of the CDM the PP provided the minutes of meeting of the Board (Ref.12a and 12d) which the project viability was discussed and decided based on CDM. Also, the PP presented proposal and the contract with the consultant "Zeroemissions" (Ref.12b, 12bi, 12bii and 12c) for CDM consultancy. Based on the evidences cited above, the proposed project activity meets the requirements of EB49, Annex 22. The CAR#03 was closed out.

**Acceptance and Close out by Lead Assessor:**

**Date:** 28/09/2009

Date:	20/04/2009		Raised by:	Fabian Gonçalves		
Type:	CAR	Number:	04		Reference:	B.7.3 – Annex 2

**Lead Assessor Comment:**

PDD version 1, section B.6.2: The parameters used to calculate the emission factor shall be presented in the section B.7.1 of the PDD, monitored parameters.

**Project Participant Response:**

**Date:** 25/05/2009

Although the CO<sub>2</sub> emission factor for the Brazilian grid is calculated and given by the DNA every year, it has been included as a monitored parameter in the section B.7.1 of the PDD.

**Documentation Provided by Project Participant:**

- Link to the CO<sub>2</sub> emission factor calculation, yearly done by the Brazilian DNA.

[www.mct.gov.br/index.php/content/view/74689.html](http://www.mct.gov.br/index.php/content/view/74689.html)

**Information Verified by Lead Assessor:**

Ref.1 - PDD version 02  
Ref.2 - ACM0006 version 9  
Brazilian DNA website

**Reasoning for not Acceptance or Acceptance and Close Out:**

25/08/2009 – Leandro Silva and Fabian Goncalves	
The parameters used to calculate the emission factor from the grid were excluded from the section B.6.2 and included in the section B.7.1 of the PDD version 02. The source of the EF <sub>OM</sub> and EF <sub>BM</sub> and the calculation of the EF <sub>CM</sub> were done correctly, so the CAR#04 was closed out.	
<b>Acceptance and Close out by Lead Assessor:</b>	<b>Date:</b> 25.08.2009

Date:	20/04/2009	Raised by:	Fabian Gonçalves		
Type:	CAR	Number:	05	Reference:	C.1.1 – Annex 2
<b>Lead Assessor Comment:</b>					
Section C.1.1 of the PDD version 1 is not complete as required by the PDD guidelines.					
<b>Project Participant Response:</b>				<b>Date:</b> 25/05/2009	
<i>The section C.1.1 of the PDD refers to the starting date of the project activity. According the PDD guidelines, the starting date of a CDM project activity is the earliest of the date(s) on which the implementation or construction or real action of a project activity begins/has begun.</i>					
<i>In the case of São Fernando project, the starting date corresponds to the purchase of the first relevant equipment, which is the first turbine. This purchase took place on 12/11/2007.</i>					
<b>Documentation Provided by Project Participant:</b>					
- Contract of purchase of the first turbine.					
<b>Information Verified by Lead Assessor:</b>					
It was verified the evidences above which were named, respectively, as:					
Ref.8a - Turbine purchase contract					
Ref.1 - PDD version 2					
<b>Reasoning for not Acceptance or Acceptance and Close Out:</b>					
25/08/2009 – Leandro Silva and Fabian Goncalves					
The section C.1.1 of the PDD version 2 was completed as required and based on evidence (Ref.8a), so the CAR#05 was closed out.					
<b>Acceptance and Close out by Lead Assessor:</b>				<b>Date:</b> 25.08.2009	

Date:	12/05/2009	Raised by:	Fabian Gonçalves		
Type:	CAR	Number:	06	Reference:	A.4.1 – Annex 2
<b>Lead Assessor Comment:</b>					
The seconds of the geographical coordinates presented in the PDD version 1 are not according to the document provided during site visit (ANEEL technical spreadsheet).					
<b>Project Participant Response:</b>				<b>Date:</b> 25/05/2009	
<i>The geographical coordinates of the project activity have been included in the PDD as indicated in the ANEEL technical spreadsheet, which corresponds to the location of the substation.</i>					
<b>Documentation Provided by Project Participant:</b>					
- ANEEL technical spreadsheet.					
<b>Information Verified by Lead Assessor:</b>					
Ref.1 - PDD version 2					
Ref.13c - Technical Info sent to ANEEL					
<b>Reasoning for not Acceptance or Acceptance and Close Out:</b>					
25/08/2009 – Leandro Silva and Fabian Goncalves					
The PDD version 2 was corrected and presents the geographical coordinates in accordance with the Brazilian Energy Agency documentation (ANEEL). The CAR#06 was closed out.					
<b>Acceptance and Close out by Lead Assessor:</b>				<b>Date:</b> 25.08.2009	

Date:	12/05/2009		Raised by:	Fabian Gonçalves		
Type:	CL	Number:	07	Reference:	B.4.2 – Annex 2	
<b>Lead Assessor Comment:</b>						
The sub-step 1b: Consistency with mandatory laws and regulations of the PDD version 1 does not present information about how the requirements of mandatory laws in Brazil were checked.						
<b>Project Participant Response:</b>				<b>Date:</b> 25/05/2009		
<i>The Secretary of Environment of the State of Mato Grosso do Sul (SEMAC) is responsible for analyzing any</i>						

possible environmental impact due to the project activity normal development. The licenses required by the Brazilian environmental regulation are:

- The preliminary license (Licença Prévia, LP).
- The construction license (Licença de Instalação, LI).
- The operating license (Licença de Operação, LO).

São Fernando plant has already all the required licenses, as detailed below:

- Preliminary licenses number 20/2009 (for the transmission line) and 27/2009 (for the substation).
- Construction license number 129/2008.
- Operating licenses protocol number 256/2009 (for the cogeneration unit), 285/2009 (for the substation) and 288/2009 (for the transmission line).

The power plant also has its authorization and registration on the National Agency of Electrical Energy (ANEEL) to operate as an independent power producer. Therefore, the project activity obeys all the mandatory laws and regulations of the state of Mato Grosso do Sul.

Project participants identified the most plausible baseline scenario and demonstrated additionality using the latest approved version of the "Combined tool to identify the baseline scenario and demonstrate additionality". According to the analysis, there were two available scenarios for the project activity:

1. The project activity not undertaken as a CDM project.  
Since the project participants have already obtained all the necessary licences for the construction and operation of the project plant, in case of construction of the same project plant, with the same characteristics but without considering the CDM revenues, it would also be consistent with laws and regulations currently applicable in Brazil.
2. The scenario #4 of the methodology ACM0006.  
The project activity involves the installation of a new biomass residue fired power plant at a site where no power was generated prior to the implementation of the project activity. In the absence of the project activity, a new biomass residue fired power plant (in the following referred to as "reference plant") would be installed instead of the project activity at the same site and with the same thermal firing capacity but with a lower efficiency of electricity generation as the project plant (e.g. by using a low-pressure boiler instead of a high-pressure boiler). The same type and quantity of biomass residues as in the project plant would be used in the reference plant. Consequently, the power generated by the project plant would in the absence of the project activity be generated (a) in the reference plant and – since power generation is larger in the project plant than in the reference plant – (b) partly in power plants in the grid. In case of cogeneration projects, the following conditions apply: The reference plant would also be a cogeneration plant; the heat generated by the project plant would in the absence of the project activity be generated in the reference plant.  
In this case, the reference plant's efficiency for power generation would be the one that is common value in the state of Mato Grosso do Sul. This efficiency has been taken from a recent sectoral report from the National Supply Company (CONAB, Companhia Nacional de Abastecimento, a public and reliable font belonging to the Brazilian Ministry of Agriculture).  
Therefore, since the reference plant would be located at the same site than the project plant, with the same characteristics than the project plant, but with an efficiency that is common practice in the state of Mato Grosso do Sul, no mandatory laws or regulations would prevent the construction of this reference plant.

#### Documentation Provided by Project Participant:

- Preliminary license (LP).
- Construction license (LI).
- Operating license (LO).
- Authorization and registration of ANEEL for operating as an independent power producer.
- CONAB report: Profile of the sugar and ethanol sector in Brazil. April 2008.

#### Information Verified by Lead Assessor:

It was verified the PDD version 2 and some evidences, such as:

Ref.13a - Despacho ANEEL Ref.13b - Portaria ANEEL Ref.13c - Technical Info sent to ANEEL Ref.15 - Environmental Licenses					
<b>Reasoning for not Acceptance or Acceptance and Close Out:</b>					
25/08/2009 – Leandro Silva and Fabian Goncalves It was added to the PDD version 2, information about how the requirements of mandatory laws in Brazil were checked. The PP provided the Construction License and the protocol of the Operating License of the project activity (Ref.15), which states the Environmental Agency, agrees with it. Also, the Brazilian Electricity Energy Agency (ANEEL) gave authorization and established the PP as an independent power producer who can sell electricity to the interconnected grid (Ref. 13a, b and c). The CL#07 was closed out.					
<b>Acceptance and Close out by Lead Assessor:</b>				<b>Date:</b> 25.08.2009	
<b>Date:</b>	12/05/2009		<b>Raised by:</b>	Fabian Gonçalves	
<b>Type:</b>	CL	<b>Number:</b>	08	<b>Reference:</b>	B.4.2 – Annex 2
<b>Lead Assessor Comment:</b>					
In the common practice analyses section, there is no conclusion about the analysis related to the efficiency of the project activity.					
<b>Project Participant Response:</b>				<b>Date:</b> 25/05/2009	
<i>According to a recent sectoral report of the Brazilian National Supply Company (CONAB) in cooperation with the Ministry of Agriculture, the power generation efficiency of the sugarcane plants in the state of Mato Grosso do Sul is, in terms of power generation per bagasse consumption, 69,4 kWh/ton (2.68% efficiency), which means the lowest efficiency of Brazil. They also have the lowest percentage of bagasse used for cogeneration, which means that these plants barely generate electricity for self consume and they do it in a very inefficient way.</i> <i>On the other hand, according to the project participants' data, when São Fernando achieves its top generation capacity the plant will generate around 468 kWh per ton of bagasse consumed (18.07% efficiency). Therefore, thanks to the high efficiency of the equipments installed in the cogeneration unit, the plant will generate (with the same bagasse consumption) more than six times as much power as the currently existing plants in Mato Grosso do Sul.</i> <i>Besides, all the bagasse generated in the São Fernando's sugarcane production process will be used for power generation.</i>					
<b>Documentation Provided by Project Participant:</b>					
<ul style="list-style-type: none"><li>- 'Profile of the Brazilian Sugarcane Sector'. April 2008. Report from the National Supply Company, CONAB (<a href="http://www.conab.gov.br/conabweb/download/safra/perfil.pdf">www.conab.gov.br/conabweb/download/safra/perfil.pdf</a>)</li><li>- Project participants' estimation for power generation, bagasse consumption and power efficiency of the project plant.</li></ul>					
<b>Information Verified by Lead Assessor:</b>					
It was verified the evidences: Ref.1 - PDD version 2 Ref.16 - UsinaSão Fernando_CER Calculation_ver.02 Ref.17a - CONAB-Perfil Setor Sucroalcoleiro 2008					
<b>Reasoning for not Acceptance or Acceptance and Close Out:</b>					
25/08/2009 – Leandro Silva and Fabian Goncalves The common practice was discussed consistently through out the section B.5 of the PDD version 2, and the analysis related to the efficiency of the project activity was clarified, so the CL#08 was closed out.					
<b>Acceptance and Close out by Lead Assessor:</b>				<b>Date:</b> 25.08.2009	
<b>Date:</b>	12/05/2009		<b>Raised by:</b>	Fabian Gonçalves	
<b>Type:</b>	CAR	<b>Number:</b>	09	<b>Reference:</b>	B.10.1 – Annex 2
<b>Lead Assessor Comment:</b>					
Regarding the monitored parameters and monitoring plan: -EG project plant: it is not clear how this parameter will be monitored. Moreover, there is no value of data applied for purpose of calculated expected emission reductions in section B.5					

-BF<sub>k,y</sub>: it is not clear how PP will monitor this parameter. Moreover according to the methodology ACM0006 "if the amount of biomass combusted is estimated from the amount of biomass delivered to the project site, a procedure should be established to undertake an energy balance for the verification period, considering the stocks of biomass at the beginning and end of each verification period", however it is not clear how the requirements of the methodology will be met.

-NCV<sub>k</sub>: QA/QC procedure described in the section B.7.1 is not according to the required by the methodology. Also the evidences for the calculation of the bagasse NCV used in the reference plant and the one used in the project activity to calculate the efficiency of the plants need to be provided.

-Moisture content of the biomass residues: the monitoring frequency required by the methodology is continuously, mean values calculated at least annually. This requirement is not met in the monitoring plan of the PDD version 1.

<b>Project Participant Response:</b>	<b>Date:</b> 25/05/2009
<p>Regarding to the comments about the monitored parameters:</p> <p><b>EG project plant:</b> the electricity generated by the project plant will be monitored through direct measurements. Data will be measured in electricity meters devices and monitoring will be done according to standards and monitoring patterns of the CCEE (Câmara de Comercialização de Energia Elétrica, a governmental institution linked to ANEEL, Brazilian National Electricity Agency).</p> <p>The consistency of metered net electricity generation will be cross-checked with receipts from electricity sales. Data will be archived in database. Data will be kept for the later of, two years after the end of the crediting period or the last issuance of CERs for the project activity.</p> <p>As the plant will be built in three different stages, the power generation will be different for each year of the crediting period, according to the installed capacity. The value of data applied for the purpose of calculating expected emission reductions in section B.5 are detailed in section B.6.3 of the PDD.</p> <p><b>BF<sub>k,y</sub>:</b> As it is the common practice in similar CDM Projects (either registered or under validation) bagasse quantity measurement in São Fernando Project is done in an indirect way. Monitoring is done in the same way as another similar Brazilian project which is already registered: Project 1062: Santa Terezinha – Tapejara Cogeneration Project (Usina de Açúcar Santa Terezinha Ltda).</p> <p>The total bagasse consumed in the facility is based on the total sugarcane crushed and the percent amount of bagasse in the sugarcane. The percentage of bagasse per unit of cane is measured in the internal laboratory. Trucks carrying the sugarcane will be weighted (loaded and empty) in a weight bridge located at the entrance of the plant. Samples of the sugarcane carried by each truck will be analyzed and the percentage of fiber in the cane will be calculated. The quantity of fiber in a specific amount of sugarcane is the same as in the bagasse proceeding from it; therefore, the quantity of bagasse available for cogeneration is directly proportional to the sugarcane produced. Data will be adjusted for the moisture content in order to determine the quantity of dry biomass. The quantity will be crosschecked with the quantity of electricity (and heat) generated.</p> <p>The quantity of bagasse combusted in the project plant is based on the quantity of heat generated in each boiler. The performance guarantee of the boilers establishes the exact proportion between the bagasse consumed and the heat generated. Heat generation is continuously monitored in both boilers.</p> <p>Data will be recorded on a working day basis by the Technical department and archived in electronic spreadsheet. It will also be prepared annually an energy balance for all the installed boilers, based on stock changes.</p> <p><b>NCV<sub>k</sub>:</b> regarding the QA/QC procedure, the methodology asks for checking the consistency of the measurements by comparing the measurement results with measurements from previous years, relevant data sources (e.g. values in the literature, values used in the national GHG inventory) and default values by the IPCC. If the measurement results differ significantly from previous measurements or other relevant data sources, conduct additional measurements. NCV will be determined on the basis of dry biomass.</p> <p>Since there are no NCV measurements from previous years, the consistency of the measurements will be checked by comparing the measurement results with default values by the IPCC.</p> <p><b>Moisture content:</b> according to the methodology, moisture content of biomass residue will be continuously monitored, which means that values will be calculated at least annually. Samples will be determined on site by the internal laboratory.</p>	
<b>Documentation Provided by Project Participant:</b>	
<ul style="list-style-type: none"> <li>- Calculation of the power generation forecast during the first crediting period.</li> <li>- Usina São Fernando's operational procedure for calculation of the quantity of bagasse combusted.</li> </ul>	



- <i>Guarantee of performance of the boilers.</i>	
<b>Information Verified by Lead Assessor:</b>	
It was verified the evidences: Ref.1 - PDD version 2 Ref.16 - UsinaSão Fernando_CER Calculation_ver.02 Ref.18a - NCV determination procedure Ref.18b - Pol, Brix, fiber and humidity procedure	
<b>Reasoning for not Acceptance or Acceptance and Close Out:</b>	
25/08/2009 – Leandro Silva and Fabian Gonçalves The monitored parameters presented in the PDD version 2 section B.7.1, including their monitoring frequency and QA/QC procedures, are in accordance with the methodology ACM0006 version 8 applied by the PP. The source of the ex-ante values of <i>NCV<sub>k</sub></i> and <i>Moisture content</i> applied by the PP for the estimation of the ER's were provided in the procedures for the calculation of fibre and water percentage (Ref.18b) and net calorific value of bagasse (Ref.18a). The CAR#09 was closed out.	
<b>Acceptance and Close out by Lead Assessor:</b>	<b>Date:</b> 25/08/2009

Date:	12/05/2009	Raised by:	Fabian Gonçalves		
Type:	FAR	Number:	10	Reference:	B.10.1
<b>Lead Assessor Comment:</b>					
As the project is not implemented yet, it is requested to the PP to provide before verification the procedures implemented to guarantee that the project will follow the required by methodology in order to assure the delivery of high quality data, including procedures for calibration of the equipments, day-to-day records handling, internal audits of GHG project, project performance reviews before data is submitted for verification, dealing with possible monitoring data adjustments and missing data allowing redundant reconstruction of data in case of monitoring problems, data storage.					
<b>Project Participant Response:</b>				<b>Date:</b> 25/05/2009	
<i>The monitoring of the electricity generated in the project plant will be done with the equipments and according to the standards and monitoring patterns of the Chamber of Commercialization of Electricity (CCEE, Câmara de Comercialização de Energia Elétrica) a governmental institution linked to the National Agency of Electricity (ANEEL, Agência Nacional de Energia Elétrica).</i>					
<i>Regarding the biomass residues, São Fernando plant has its own internal laboratory for analyzing and monitoring the main specifications of the bagasse combusted. In this laboratory the procedures for calibration and maintenance of the instruments will be done according to the regulations of the Brazilian Standards Association (Associação Brasileira de Normas Técnicas, ABNT), and the National Institute of Metrology and Normalization (Instituto Nacional de Metrologia, Normalização e Qualidade Industrial, INMETRO), and will be done during preventive maintenance operation of Usina São Fernando.</i>					
<i>São Fernando plant will also organise the staff training in the appropriate monitoring, measurement and reporting techniques. The responsible for the cogeneration unit of the plant will also be the person in charge for organising the staff training. In order to ensure the correct development of the monitoring process, the plant has implemented two documents of procedures:</i>					
<i>- CDM Responsible Procedure: it appoints a responsible for the monitoring and explains which his duties and obligations are.</i>					
<i>- Formation for Monitoring Procedure: it resumes the procedures that must be taken into account in order to achieve a proper training for the staff that is in charge for the monitoring.</i>					
<i>As an extra quality assurance measure, project participants will also count on the continuous assessment from the PDD consultants during the whole verification period.</i>					

Date:	05/06/2009		Raised by:	Fabian Gonçalves		
Type:	CAR	Number:	11		Reference:	B.4.1
Lead Assessor Comment:						

According to Combined Tool, in cases where one or more alternatives are not available options to project participants, a different procedure than the one provided here would be required to demonstrate additionality and identify the baseline scenario. In this case the proposed project activity includes grid-connected power projects (where an alternative might be electricity produced by other facilities not under the control of project participants). Project participants can continue to use, if desired, the additionality tool, and provide their own methods to develop and/or assess baseline scenario.

<b>Project Participant Response:</b>	<b>Date:</b> 05/06/2009
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*One of the alternative scenarios to the project activity is the construction of a new cogeneration plant with less efficient equipments. This plant, with the same installed capacity, would fire the same type and quantity of biomass residues as in the project plant, but with a lower power generation. In this case, the difference between the power generated by the project plant and the power generated by the less efficient plant would be generated by other facilities that are currently connected to the grid and are not under the control of the project participants.*

*In this possible and feasible scenario and according to the latest approved version of the Combined Tool, project participants are able to use the "Tool for the demonstration and assessment of additionality".*

*The CDM Executive Board (EB) on its 47<sup>th</sup> meeting (paragraph 23 of the meeting report) asked for the deviation from the use of Combined Tool prescribed by the methodology and requested the Meth Panel to review the possibility of allowing the use of Additionality Tool, in place of Combined Tool.*

*The Meth Panel on its 39<sup>th</sup> meeting recommended the EB to approve a revision of the combined tool in the context of the overall revision of ACM0006. According to the Meth Panel, the use of the combined tool is currently restricted to situations in which all potential alternative baseline scenarios to the proposed project activity are available options to the project participants.*

*Therefore, in this case, the additionality was determined using the "Tool for the demonstration and assessment of additionality"; version 05.2.*

**Documentation Provided by Project Participant:**

PDD version 2.

**Information Verified by Lead Assessor:**

Ref.1 - PDD version 2 and version 3

Ref.2 – ACM0006 version 8

**Reasoning for not Acceptance or Acceptance and Close Out:**

25/08/2009 – Leandro Silva and Fabian Goncalves

The "Tool for the demonstration and assessment of additionality"; version 05.2 was applied by the PP in the PDD version 2.(ref. 1).

16/06/2010 – Fabian Gonçalves and Lucas Engelbrecht

The PDD version 3 was revised to apply the Combined tool to identify the baseline scenario and demonstrate additionality (ref. 2a).

According to the Combined tool, foot note 1: *"The Meth Panel is considering whether expanding this tool to cover all cases would be appropriate. In the meantime, methodologies that typically involve alternatives are not under the control of project participants can continue to use, if desired, the additionality tool (provides benchmark and other tools), and provide their own methods to develop and/or assess baseline scenario."*

And according to the AM CLA 0120: to apply the Additionality tool the PP needs to provide their own approach to assess the baseline scenario supported by a deviation.

The PP decided to not apply for a deviation but to follow exactly the Combined tool in the PDD version 3.

CAR #11 was closed out.

<b>Acceptance and Close out by Lead Assessor:</b>	<b>Date:</b> 16/06/2010
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Date:	27/07/2009	Raised by:	Fabian Gonçalves
Type:	CAR	Number:	12
		Reference:	E.1.1

<b>Lead Assessor Comment:</b>	<b>Date:</b> 27/07/2009
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Regarding the local stakeholders consultation, resolution number 7 of the Brazilian DNA, establishes that the PP shall *"II – inform the specific electronic address for the web site where copies can be obtained, in Portuguese, of the last available version of the project design document in question, as well as the description of the project activity's contribution under the Clean Development Mechanism towards sustainable development, as per Annex III of Resolution no. 1 of this Commission, guaranteeing this site will remain accessible at least until conclusion of the project activity registration process by the CDM Executive Board"*. Verified that this requirement was not meet. PDD was not available in Portuguese.

<b>Project Participant Response:</b>	<b>Date:</b> 31/07/2009
<p><i>The letter sent to the stakeholders by the project participants included an email address and a postal mail for requesting for more information about the projects, including the PDD translated into Portuguese and the description of the project activity's contribution under the Clean Development Mechanism towards sustainable development, as per Annex III of Resolution no. 1 of the Brazilian DNA.</i></p> <p><i>One of the stakeholders consulted (Centro de Tecnologia Canavieira, Sugarcane Technology Centre) used the email address provided in the letter in order to ask for more information. According to the DNA specifications, the translation into Portuguese of the available version of the PDD and the description of the project activity's contribution under the Clean Development Mechanism towards sustainable development were sent to him.</i></p>	
<b>Documentation Provided as Evidence by Project Participant:</b>	
<ul style="list-style-type: none"> <li>- Letter sent to the stakeholders.</li> <li>- Stakeholder's request for more information about the project.</li> <li>- PDD translated into Portuguese sent to the stakeholder.</li> <li>- Project activity's contribution under the CDM towards sustainable development, as per Annex III of Resolution no. 1 of the Brazilian DNA.</li> <li>- Email sent for replying the stakeholder's request.</li> </ul>	
<b>Information Verified by Lead Assessor:</b>	
<p>The information verified was:</p> <p>Ref.20 - PDD_Sao Fernando_ver.01 _português</p> <p>Ref.20a - USF - Carta stakeholders</p> <p>Ref.20b - ARs dos stakeholders do São Fernando Biomass Cogeneration Project</p> <p>Ref.20c - Stakeholder contact</p>	
<b>Reasoning for not Acceptance or Acceptance and Close Out:</b>	
<p>25/08/2009 – Leandro Silva and Fabian Goncalves</p> <p>Based on the email contacts from the local stakeholder "CTC" and the reply from the PP (Ref.20c) with the PDD in Portuguese (Ref.20), on the letters sent to the local stakeholders (Ref.20a), and on the receipts of the letters (Ref.20b), the PP reached the requirements from the Brazilian DNA resolution nº7 for local stakeholder consultation. The CAR#12 was closed out.</p>	
<b>Acceptance and Close out by Lead Assessor:</b>	<b>Date:</b> 25/08/2009



## A.4 Annex 4: Team Members Statements of Competency

### Statement of Competence

Name: **Goncalves, Fabian.**

#### Status

- Lead Assessor	<input checked="" type="checkbox"/>	- Expert	<input type="checkbox"/>
- Assessor	<input checked="" type="checkbox"/>	- Financial Expert	<input type="checkbox"/>
- Local Assessor	<input type="checkbox"/>	- Technical Reviewer	<input type="checkbox"/>

#### Scopes of Expertise

<b>1. Energy Industries (renewable / non-renewable)</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>2. Energy Distribution</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>3. Energy Demand</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>4. Manufacturing</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>5. Chemical Industry</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>6. Construction</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>7. Transport</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>8. Mining/Mineral Production</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>9. Metal Production</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>10. Fugitive Emissions from Fuels (solid, oil and gas)</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>12. Solvent Use</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>13. Waste Handling and Disposal</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>14. Afforestation and Reforestation</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>15. Agriculture</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	

Approved Member of Staff by:

**Siddharth Yadav**

Date:

**25/10/2009**

## Statement of Competence

Name: Engelbrecht, Lucas

### Status

- Lead Assessor		- Expert	
- Assessor		- Financial Expert	
- Local Assessor	Brazil	- Technical Reviewer	

### Scopes of Expertise

<b>1. Energy Industries (renewable / non-renewable)</b>	
<i>Sub scope(s):</i>	
<b>2. Energy Distribution</b>	
<i>Sub scope(s):</i>	
<b>3. Energy Demand</b>	
<i>Sub scope(s):</i>	
<b>4. Manufacturing</b>	
<i>Sub scope(s):</i>	
<b>5. Chemical Industry</b>	
<i>Sub scope(s):</i>	
<b>6. Construction</b>	
<i>Sub scope(s):</i>	
<b>7. Transport</b>	
<i>Sub scope(s):</i>	
<b>8. Mining/Mineral Production</b>	
<i>Sub scope(s):</i>	
<b>9. Metal Production</b>	
<i>Sub scope(s):</i>	
<b>10. Fugitive Emissions from Fuels (solid, oil and gas)</b>	
<i>Sub scope(s):</i>	
<b>11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride</b>	
<i>Sub scope(s):</i>	
<b>12. Solvent Use</b>	
<i>Sub scope(s):</i>	
<b>13. Waste Handling and Disposal</b>	
<i>Sub scope(s):</i>	
<b>14. Afforestation and Reforestation</b>	
<i>Sub scope(s):</i>	
<b>15. Agriculture</b>	
<i>Sub scope(s):</i>	

Approved Member of Staff by:

Siddharth Yadav

Date:

05/10/2009

Name: Santos, Roberto

#### Status

- Lead Assessor	<input type="checkbox"/>	- Expert	<input type="checkbox"/>
- Assessor	<input type="checkbox"/>	- Financial Expert	<input checked="" type="checkbox"/>
- Local Assessor	<input type="checkbox"/>	- Technical Reviewer	<input type="checkbox"/>

#### Scopes of Expertise

<b>1. Energy Industries (renewable / non-renewable)</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>2. Energy Distribution</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>3. Energy Demand</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>4. Manufacturing</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>5. Chemical Industry</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>6. Construction</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>7. Transport</b>	<input type="checkbox"/>
<i>Sub scope(s): Transport</i>	
<b>8. Mining/Mineral Production</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>9. Metal Production</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>10. Fugitive Emissions from Fuels (solid, oil and gas)</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>12. Solvent Use</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>13. Waste Handling and Disposal</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>14. Afforestation and Reforestation</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>15. Agriculture</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	

Approved Member of Staff by: Siddharth Yadav Date: 20/01/2010

Name: Kurmi, Sandeep

### Status

-	Lead Assessor		-	Expert	x
-	Assessor	x	-	Financial Expert	
-	Local Assessor	India	-	Technical Reviewer	

### Scopes of Expertise

<b>1. Energy Industries (renewable / non-renewable)</b>	<b>x</b>
<i>Sub scope(s): Combined heat and Power &amp; Waste Heat and Biomass Electricity Utilization</i>	
<b>2. Energy Distribution</b>	
<i>Sub scope(s):</i>	
<b>3. Energy Demand</b>	
<i>Sub scope(s):</i>	
<b>4. Manufacturing</b>	<b>x</b>
<i>Sub scope(s): Lime Production and Use</i>	
<b>5. Chemical Industry</b>	
<i>Sub scope(s):</i>	
<b>6. Construction</b>	
<i>Sub scope(s):</i>	
<b>7. Transport</b>	
<i>Sub scope(s):</i>	
<b>8. Mining/Mineral Production</b>	
<i>Sub scope(s):</i>	
<b>9. Metal Production</b>	
<i>Sub scope(s):</i>	
<b>10. Fugitive Emissions from Fuels (solid, oil and gas)</b>	
<i>Sub scope(s):</i>	
<b>11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride</b>	
<i>Sub scope(s):</i>	
<b>12. Solvent Use</b>	
<i>Sub scope(s):</i>	
<b>13. Waste Handling and Disposal</b>	
<i>Sub scope(s):</i>	
<b>14. Afforestation and Reforestation</b>	
<i>Sub scope(s):</i>	
<b>15. Agriculture</b>	
<i>Sub scope(s):</i>	

Approved Member of Staff by: Siddharth Yadav Date: 27 November 2009

Name: Nardelli, Aurea

#### Status

- Lead Assessor	x	- Expert	x
- Assessor	x	- Financial Expert	
- Local Assessor	Brazil	- Technical Reviewer	x

#### Scopes of Expertise

##### 1. Energy Industries (renewable / non-renewable)

Sub scope(s):

##### 2. Energy Distribution

Sub scope(s):

##### 3. Energy Demand

Sub scope(s):

##### 4. Manufacturing

Sub scope(s):

##### 5. Chemical Industry

Sub scope(s):

##### 6. Construction

Sub scope(s):

##### 7. Transport

Sub scope(s):

##### 8. Mining/Mineral Production

Sub scope(s):

##### 9. Metal Production

Sub scope(s):

##### 10. Fugitive Emissions from Fuels (solid, oil and gas)

Sub scope(s):

##### 11. Fugitive Emissions from Production and

#### Consumption of Halocarbons and Sulphur Hexafluoride

Sub scope(s):

##### 12. Solvent Use

Sub scope(s):

##### 13. Waste Handling and Disposal

Sub scope(s):

##### 14. Afforestation and Reforestation

*Sub scope(s): A/R of degraded Land, A/R with agricultural issues, A/R  
for wood production*

**15. Agriculture**

*Sub scope(s):*

Approved Member of Staff by:

Siddharth Yadav

Date:

07/10/2009

## Statement of Competence

Name: Liao, Yi

### Status

- Lead Assessor		- Expert	x
- Assessor		- Financial Expert	
- Local Assessor	China	- Technical Reviewer	

### Scopes of Expertise

<b>1. Energy Industries (renewable / non-renewable)</b>	x
<i>Sub scope(s): Biomass based Thermal/Electricity Generation Combined heat and power &amp; waste heat utilisation</i>	
<b>2. Energy Distribution</b>	
<i>Sub scope(s):</i>	
<b>3. Energy Demand</b>	
<i>Sub scope(s):</i>	
<b>4. Manufacturing</b>	
<i>Sub scope(s):</i>	
<b>5. Chemical Industry</b>	
<i>Sub scope(s):</i>	
<b>6. Construction</b>	
<i>Sub scope(s):</i>	
<b>7. Transport</b>	
<i>Sub scope(s):</i>	
<b>8. Mining/Mineral Production</b>	
<i>Sub scope(s):</i>	
<b>9. Metal Production</b>	
<i>Sub scope(s):</i>	
<b>10. Fugitive Emissions from Fuels (solid, oil and gas)</b>	
<i>Sub scope(s):</i>	
<b>11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride</b>	
<i>Sub scope(s):</i>	
<b>12. Solvent Use</b>	
<i>Sub scope(s):</i>	
<b>13. Waste Handling and Disposal</b>	x
<i>Sub scope(s): Landfill gas</i>	
<b>14. Afforestation and Reforestation</b>	
<i>Sub scope(s):</i>	
<b>15. Agriculture</b>	
<i>Sub scope(s):</i>	

Approved Member of Staff by: Siddharth Yadav Date: 19/05/2010