VALIDATION REPORT

Santa Cruz S.A – Açúcar e Álcool

Ecoinvest Carbon Brasil Ltda

Santa Cruz S.A – Açúcar e Álcool – Cogeneration Project

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Summary

SGS Brazil, an affiliate of SGS United Kingdom Ltd. has made a validation of the CDM project activity "Santa Cruz S.A – Açúcar e Álcool – Cogeneration Project on the basis UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM rules and modalities and the subsequent decisions by the CDM Executive Board, as well as the host country criteria.

The validation has been performed as a desk review of the project documents presented by Santa Cruz S.A – Açúcar e Álcool and a site visit to Santa Cruz S.A plant located in Américo Brasiliense, São Paulo, Brazil, where staff from the company and its consultant were interviewed.

The project is owned by Santa Cruz S.A, a sugar cane based mill. Santa Cruz project consists on the installation of more efficient equipment using sugar cane bagasse for electricity cogeneration. At full capacity, Usina Santa Cruz S.A. – Açúcar e Álcool is expected to generate yearly 192,780 MWh power surpluses.

The methodologies applied to the project are ACM0006 – "Consolidated baseline methodology for grid-connected electricity generation from biomass residues" (version 6) and ACM0002 - "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" (version 6).
Total amount of emission reductions for the first crediting period is estimated to be 401,596 t CO_2 e.
In summary, it is SGS's opinion that the proposed CDM project activity correctly applies the baseline and monitoring methodology as mentioned in approved methodology adopted for the proposed project activity and meets the relevant UNFCCC requirements for the CDM and the relevant host country criteria.

Subject.:			
CDM validation			**Indexing terms**
Work carried out by			
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Technical review			
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Abbreviations

ACM	Approved Consolidated Methodology
ANEEL	Agencia Nacional de Energia Elétrica (Brazilian Agency of Power Electricity).
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
DNA	Designated National Authority
DOE	Designated Operational Entity
EF	Emission Factor
ER	Emissions Reduction
MP	Monitoring Plan
NIR	New Information Request
PDD	Project design Document
SGS	Société Générale de Surveillance

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1. Introduction

1.1 Objective

Santa Cruz S.A – Açúcar e Álcool has commissioned SGS to perform the validation of Santa Cruz S.A – Açúcar e Álcool – Cogeneration Project with regard to the relevant requirements for 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.

1.2 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.

1.3 GHG Project Description

This project activity consists of the replacement of an existing biomass residue fired power plant by more efficient equipment to electricity cogeneration, using sugar cane bagass was biomass. Replacing old equipment, the project will generate enough energy for powering the sugar mill and for delivering surplus electricity to the national grid, avoiding the dispatch of same amount of energy produced by fossil-fuelled thermal plants to that grid.

The project is owned by Santa Cruz S.A – Açúcar e Álcool, a sugar cane based mill.

The project is expected to generate an annual average of 192,780 MWh power surplus, operating at full capacity during the season. Total amount of emission reductions for the first crediting period (7 years) is 401,596 t CO_2e.

Baseline Scenario:
In the absence of the project activity, the existing plant would also be replaced by a new biomass residue fired power plant, however, this reference plant would have a lower efficiency of electricity generation than the project plant. The same type and quantity of biomass residues as in the project plant would be used in the reference plant.

With-project scenario:
Santa Cruz plant will generate power surplus, eliminating the consumption of electrical energy from the grid and also allowing for the delivery of surplus energy to the grid.

Leakage:
No leakage was identified for this project.

Environmental and social impacts:

Santa Cruz plant is covered by the Operating License nº 28002148 (24/03/2008) issued by *CETESB – Companhia de Tecnologia de Saneamento Ambiental* (environmental agency of the state of São Paulo).

To increase the capacity of the cogeneration plant, a specific license was required by SMA – *Secretaria de Meio Ambiente do Estado de São Paulo*. The preliminary license was issued on 26/04/2007 (Preliminary Environmental License – LP 01108 issued by SMA/SP, see Ref.16). For the next phase of the project, Santa Cruz is asking for the Installation License (request sent to CETESB on 06/09/2007, see Ref.17).

An evaluation of the plant environmental performance was carried out in April 2007 (Ref. 18) as request by the state environmental agency. The evaluation results in a plan for environmental performance improvement, mainly related to the emissions from the boilers. Mitigation measures and a monitoring plan were also included in that plan.

The bagasse cogeneration is a sustainable source of energy that brings advantages for mitigating global warming and also creates a sustainable competitive advantage for the sugarcane industry in Brazil. In addition to environmental benefits to be obtained from the CDM project, the revenues obtained from the sale of the CERs will help Santa Cruz S.A. to continue supporting its social initiatives and partnership with local communities.

1.4 The names and roles of the validation team members

Name	***Role***
Aurea Nardelli	Lead Assessor
Geisa Príncipe	Assessor
Mayra Caradec	Local assessor

Statement of Competence of team members are attached at Annex IV.

2. Methodology

2.1 Review of CDM-PDD and additional documentation

The validation is performed primarily as a document review of the publicly available project documents. The assessment is performed by trained assessors using a validation protocol.

A site visit is usually required to verify assumptions in the baseline. Additional information can be required to complete the validation, which may be obtained from public sources or through telephone and face-to-face interviews with key stakeholders (including the project developers and Government and NGO representatives in the host country). These may be undertaken by the local SGS affiliate. The results of this local assessment are summarized in Annex 1 to this report.

2.2 Use of the validation protocol

The validation protocol used for the assessment is partly based on the templates of the IETA / World Bank Validation and Verification Manual and partly on the experience of SGS with the validation of CDM projects. 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.

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

Checklist Question	***Means of verification (MoV)***	***Comment***	***Draft and/or Final Conclusion***
The various requirements are linked to checklist questions the project should meet.	*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). **New Information Request (NIR)** is used when the validation team has identified a need for further clarification.*

The completed validation protocol for this project is attached as Annex 2 to this report

2.3 Findings

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

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

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

is issued, where:

I. mistakes have been made with a direct influence on project results;

II. validation protocol requirements have not been met; or

III. there is a risk that the project would not be accepted as a CDM project or that emission reductions will not be verified.

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

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

Corrective Action Requests and New Information Requests are raised in the draft validation protocol and detailed in a separate form (Annex 3). In this form, the Project Developer is given the opportunity to "close" outstanding CARs and respond to NIRs and Observations.

2.4 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.

3. Determination Findings

3.1 Participation requirements

Host Party: Brazil is listed as the host Party. Brazil has ratified the Kyoto Protocol on 23rd August 2002 (http://unfccc.int/files/essential_background/kyoto_protocol/application/pdf/kpstats.pdf).

At time of the validation, no Letter of Approval from the host country had been provided. The Letter of Approval will be signed when the DNA of Brazil has received and analysed the validation report.

3.2 Baseline selection and additionality

The methodology applied to the project is the “ACM0006 – Consolidated baseline methodology for grid-connected electricity generation from biomass residues” (version 6).

For calculation of the baseline emission factor of the grid, ACM0002 (version 6) was applied.

The discussion of additionality used the “Tool for the demonstration and assessment of additionality” (version 5).

The project falls under Scenario 18 of ACM0006. It was verified that the project activity meets the applicability conditions required by the methodology:

(1) The primary fuel in the project plant is sugar cane bagasse. The bagasse used in the Santa Cruz Cogeneration Project is a residue of the production of sugar carried in the same facility where the project is located. In this case, the project complies with the criterion that required no other biomass types than biomass residues being used in the project plant and these biomass residues are the predominant fuel used in the project plant.

(2) The implementation of the project shall not result in an increase of the processing capacity of raw input or other substantial changes in the process. Any increases in the bagasse production will be due to Santa Cruz natural expanding business and can not be attributed to the implementation of the cogeneration project. Production data from 2002 to 2006 years demonstrated an increasing trend in Santa Cruz production, before the project activity implementation.

(3) The methodology requires that the biomass used by the project facility should not be stored for more than one year. In the case of the project, the bagasse will be stored from the end of the harvest season, in November, until the beginning of the following harvest season, in April. The volume of bagasse stored between seasons is foreseen to be less than 5% of the total amount of bagasse generated during the year or during the harvest period.

(4) The biomass used in this project is not transformed or prepared in any way before being used as a fuel. So, no significant energy quantities are required to prepare the biomass residues for fuel consumption.

To justify the applicability of the scenario 18, the following components of the project, related to power generation, biomass and heat generation were mentioned in the PDD and confirmed during the validation:

- 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. The new project plant has the same technical lifetime as the reference plant;
- Biomass: in the absence of the project, the same type and quantity of biomass residues would have used for heat and/or electricity generation at the project site. In this case it is sugar cane bagass. Evidences were confirmed through site visit and checking details about the three plants consider to defined the reference plant (Ref.9).
- Heat: in the absence of the project activity, the heat generated by the project plant would in the absence of the project activity be generated in the reference plant, fired with the same type of biomass residues but with a different efficiency of heat generation (e.g. an efficiency that is common practice in the relevant industry sector). Although ACM0006 states in page 17 for scenario 18 that "the efficiency of heat generation in the project plant is smaller or the same compared to the reference plant", in pages 36-37, the methodology considers that the efficiency of heat generation, i.e. the heat generated per quantity of biomass residue fired, may differ between the project plant and the plant in the baseline scenario (the "reference plant"). ACM0006 gives the alternative to demonstrate that the thermal efficiency in the project plant is larger or similar compared with the thermal efficiency of the plant considered in baseline scenario. In the case of Santa Cruz, it was verified that the project plant has thermal efficiency larger than the reference plant.

The information provided about reference plants (Ref.09) was verified. Data about the installed capacity and date of starting the operation were confirmed by the respective Operation Licenses, issued by governmental agencies. The value of sugar cane bagass NCV applied was obtained from similar projects. The total amount of sugar cane crushed and consequently, the calculation of bagass production in each plant was obtained from "Portal Unica" (it is the official site of Brazilian sugar cane industry).

The PDD determined the baseline scenario and demonstrated additionality using the "Tool for the demonstration and assessment of additionality" (version 5). It is not the approach required by ACM0006. The methodology requires the use of "Combined toll to identify the baseline scenario and demonstrate additionality". NIR 3 (related to baseline scenario determination) and NIR 4 (related to the approach for discussion of additionality) were raised.

To clarify these issues, the client explained that the alternatives to the project activity are:

- A new plant operating with low energy efficiency and not exporting electricity to the grid;
- The project activity implemented without been registered as a CDM project; and
- The country providing the same amount of energy using the current generation system, which is electricity supplied by large hydro and thermal power stations.

It was justified that methodologies using the combined tool are only applicable if all potential alternative scenarios to the proposed project activity are available options to project participants. For grid-connected power projects, such as Santa Cruz, an alternative would be the electricity production by other facilities. This alternative is not under the control of project participants. In those cases, according to the "*Combined tool to identify the baseline scenario and demonstrate additionality*" foot notes, participants could continue to use the "Tool for the demonstration and assessment of additionality". The explanation was accepted by the validation team and NIRs 3 and 4 were closed out.

Considering the steps required by the “Tool for the demonstration and assessment of additionality”, the PDD discussed the additionality using the investment analysis (Step 2) and barriers analysis (Step 3). Regarding the investment analysis, the following issues were raised:

- NIR 16: It was not possible to confirm the results and conclusions of the investment analysis and sensitivity analysis mentioned in the PDD. It was not provided the complete worksheet, with data, formulae and assumptions used for calculation of the project cash flow. In addition, a summary of the worksheet and its data were not included in the PDD.

To close out NIR 16, the electronic spreadsheet used for the cash flow and for the sensitivity analysis was provided to the DOE (Ref.5). Data (11.3 %) which support the calculation of the WACC (Weighted Average Cost of Capital), used as the Santa Cruz internal benchmark, were also provided. The validation team discussed the assumptions and values with the project consultants, in order to verify the data considered in the calculation. Figures related to costs, prices and rates, among others, were confirmed by reviewing references and by checking independent sources, if applicable (see Ref. 11, 12a, 12b, 13 and 15). The information provided was transparent and complete, and all assumptions applied were considered reasonable. NIR 16 was closed out.

From the benchmark analysis (option III of the step 2), it was demonstrated that the IRR (9.30%) of the project was lower than the company internal benchmark i.e. WACC value (11.13%). The IRR was calculated considering the period of 18 years. The cash flow analysis would be of 13 years (first year of cash flow, the amortization period of 10 years and the grace period of 2 years). However, due to the importance and the size of the Project (greater than normal projects at Santa Cruz) and the credit line which was used (with higher interest rates) a period of 18 years was used for the cash flow analysis (with 5 years amortization period).It is longer than the time considered for financial analysis in similar projects in Brazil required obtaining financing from banks or other agencies of credit. In addition, is longer than periods considered for the project developer for other investment options, once the bench mark analysis is used for discussion of the additionality.

The sensitivity analysis considered increasing in the project revenue and reduction in running costs. Financial analyses were performed changing each of these parameters by 5%, and assessing what the impact on the project IRR. It was verified that the project IRR remained lower than the benchmark even in the case where these parameters change in favor of the project.

In addition to the investment analysis, the PDD presented a barrier analysis. Regarding the barrier analysis presented during the desk study, the following issues were raised:

- NIR 5: The discussion of barriers (institutional barriers) was justified in the PDD using the context of year 2004. It should be provided additional information to support that the 2004 context had impact on the project activity. The “Core business barrier” discussed in the PDD could not be justified “per si”. Additional evidence should be provided that the sale of electricity represents 7.5 % of the total net revenues.

To close out NIR 5, the analysis related to the “Core business barrier” was provided (Ref.14). It demonstrated that the sale of electricity will represent around 8.7% of the total net revenues of the mill. The value was corrected in the revised PDD. It was also revised the starting date of the project (see also NIR 12) which was changed to 28/09/2006. Additional information was mentioned and discussed in the PDD to support that the 2004 context is still valid and has impact on the project activity. The complete references were included in the PDD and were verified by the validation team. The barriers mentioned were considered still valid when the baseline study was carried out. Data provided in the revised PDD (related to operating plants, October 2007) demonstrated that the generation of electrical energy from sugarcane bagasse represents 2.69% of the total generation of electricity in Brazil. The analysis also demonstrated that the implementation of fossil fuel thermal plants are not affected by the barriers mentioned in the PDD and would be the most likely alternative to this project. NIR 5 was closed out.

- NIR 6: Additional information was required to demonstrate that the project is not common practice. The sources of the information "Currently in Brazil, there are more than 320 sugar mills producing sugar, ethanol and electricity to supply their own energy consumption, but less than 20% have developed expansion programs for their power plants"… were not provided in the PDD. Also, it was not clear why Coopersucar was mentioned in this section, as it was not informed that Santa Cruz is member of this cooperative.

To clarify NIR 6, the sources of data mentioned in the discussion of Step 4 were included in the PDD. The references provided were verified and figures were confirmed. It was clarified that Santa Cruz is not a member of Coopersucar, but this cooperative was mentioned because it is the most important sugar cooperative in Brazil and, therefore, an important parameter to substantiate the common practice analysis. NIR 6 was closed out.

It was evidenced that CDM was seriously considered when the company decided to implement the project, as demonstrated in the directors meeting notes (carried out on 24 August 2006, Ref. 44).

The PP proved that the starting date (28/09/2006 – ref. 10 – page 4) refers to investment approved by Santa Cruz relating to order of major equipment (boiler of 150t/h).

After the CARs and NIRs related to the additionality discussion were adequately addressed, it was confirmed that, as discussed in the PDD (section B.5), the project is not the most attractive investment if compared with the internal benchmark of the company. In addition, the generation of electricity by sugar mills is not a common practice in the region where the project is installed. References and sources of data used to support the Step 4 discussion were verified and it is confirmed that less than 20% of the sugar mills have developed expansion programs for their power plants (excluding CDM projects). Considering both the investment analysis and barriers analysis, it was concluded that the project is additional.

3.3 Application of Baseline methodology and calculation of emission factors

The spatial extend of the project encompasses the bagasse stocking area, the means for transportation of biomass from stock to power plant, the bagasse power plant at the project site and all power plants connected physically to the electricity system (interconnected grid) that the CDM project power plant is connected to.

Regarding the sources of GHG included in the project boundary, the emission sources and gasses related to the project activity were not identified and described in a complete manner. In the table of section B.3 it was lacking to inform about on-site the electricity consumption due the project activity (stationary or mobile). CAR 2 was raised.

It was confirmed in the revised PDD the inclusion of the missing information. Only the emissions (CO_2) of the grid electricity generation in the baseline were considered into the project boundary. The other sources and gases mentioned by the methodology were discussed and justification related to their exclusion was provided in the PDD. CAR 2 was closed out

- CAR 7: The equation 1 presented in the PDD (Section B.61) was not informed exactly as equation 1 for calculation of Emission Reductions of ACM0006 version 6.

To address CAR 7, the PDD was revised and the correct equation was included as:

ERy = ERheat.y + ERelectricity.y – PEy – Ly. CAR 7 was closed out.

Baseline emissions due to natural decay or burning of anthropogenic sources of biomass residues are not applicable to the project and were excluded of the equation above.

Although ACM0006 states in page 17 for scenario 18 that "the efficiency of heat generation in the project plant is smaller or the same compared to the reference plant", in pages 36-37, the methodology considers that the efficiency of heat generation, i.e. the heat generated per quantity of biomass residue fired, may differ between the project plant and the plant in the baseline scenario (the "reference plant").

ACM 0006 gives the alternative to demonstrate that the thermal efficiency in the project plant is larger or similar compared with the thermal efficiency of the plant considered in baseline scenario and then assume *ERheat,y* = 0.
It was verified on-site that the project implementation did not involve additional heat generation from other sources or increased operation of the project plant. There is no additional boiler or fossil fuel consumption for power or heat generation at the site. Data provided about reference plant demonstrated that the thermal efficiency of the project plant is larger than the baseline scenario.

In the case of Santa Cruz plant, emission reductions from heat were not considered in the calculations because the heat efficiency of the new plant is higher than the heat efficiency of the equipment considered in the baseline scenario and, for conservativeness reasons, they are excluded, as allowed by the methodology for scenario 18 (ACM0006, pages 36-37).

Project emissions (PE_y) are zero. No activities increasing GHG emissions were identified.

Leakage is considered to be zero. No diversion of biomass were identified which can result in the increase of fossil fuel consumption.

The emission reductions due to the displacement of electricity were calculated as required by ACM0006, scenario 18 (applicable to the project). The following equation was used:

$$EGy = EG_{project\ plant.y} * (1- \varepsilon_{el\ baseline\ plant} / \varepsilon_{el\ project\ plant})$$

EGy is determined based on the average net efficiency of electricity generation in the reference plant that would be installed in the absence of the project activity and that would have a lower efficiency of electric generation than the project plant and the average net efficiency of electricity generation in the project plant after project implementation.

The data and references for calculation of the average net efficiency of electricity generation in the reference plants were provided when CAR 13 was closed out (see details below and Ref. 9). A list of new plants which export energy to the grid was obtained in Única's website. Their efficiency was obtained with data obtained directly with the three producers (Eldorado, Itapagipe and Limeira do Oeste plants). The average obtained was 0.034 MWh electricity / MWh biomass.

The average net efficiency of electricity generation in the project plant was calculated by dividing the electricity generation during the year by the quantity of fuel (in the case of project, total of bagasse) expressed in energy units.

The bagass NCV value used for calculation of the efficiency of reference plants was 2.0 MWh/ton bagass (value provided by the reference plants) and 2.04 MWh/ton bagass (for project plant, value monitored by Santa Cruz).

The quantity of biomass combusted in the project plant was estimated based on the total of sugar cane to be milled yearly. The amount of sugar cane processed yearly, presented in the PDD and in the cash flow spreadsheet, are consistent with historic data of Santa Cruz available on-site (Ref.24 and 25).

Emission reductions are obtained by multiplying the net quantity of increased electricity generated with sugar cane bagasse as a result of the project activity (*EGy*) with the CO_2 baseline emission factor for the electricity displaced due to the project (*EFelectricity,y*). Net quantity is the exported energy plus the energy consumed internally in the sugar mill minus the energy consumed in the auxiliary systems. The following equation was used:

$ER = EG_y x EF$

EF was calculated *ex-ante*, following the steps and formulas defined by ACM0002 (version 6).

The following NIR and CAR were raised related to the EF calculation:

- NIR 8: It is not clear if the vintage of the baseline data mentioned in the PDD is correct. ACM0002 (version 6) requires the most recent 3 years for which data are available at the time of PDD submission. The data used were from 2003-2005. Also, in the PDD Annex 3 there were references to dispatch information from 2002 to 2004. It is not clear which period was applied and it should be justified (with evidences) why data of 2006 were not considered.

To close out NIR 8, the calculation of EF grid was revised. The value obtained was 0.2826 tCO_2/MWh. Data used for calculation were updated, was verified in Ref. 7. A new version of PDD included the period 2004-2006. NIR 8 was closed out.

- CAR 13: The information provided for data and parameters available at validation was incomplete. It was not informed the source of data used for *ex-ante* calculation of $EF_{grid,}$ $EFBM_{grid}$ $EFOM_{grid;}$ and the values $EFBM_{grid}$ $EFOM_{grid.}$ Also, it was not provided the source of data and value applied for the efficiency of the reference plant in the complete table.

To close out CAR 13, formulas and data used for EF calculation were verified and were included in the PDD (see also NIR 8). Sources of data for the efficiency of the reference plant were included in the table related to this parameter (PDD, section B.6.2) and were confirmed by the validation team (See Ref.9). Information about electricity efficiency calculation was provided in section B.6.3. CAR 13 was closed out.

After to close out CARs and NIRs above mentioned, the spreadsheet with ERs calculation was revised (Ref.6). Formulas and data used were confirmed. The estimation of 401,596 t CO_2e was supported by the evidences verified during the validation.

3.4 Application of Monitoring methodology and Monitoring Plan

As required by ACM0006, for the scenario 18, the following parameters will be monitored:

- Net quantity of electricity generated in the project plant (obtained from the quantity of exported electricity, the quantity of electricity consumed internally and the quantity of electricity consumed by the auxiliary systems);
- Net quantity of increased electricity generation as a result of the project activity (calculated);
- Quantity of bagasse combusted in the project plant;
- Moisture content of the bagasse;
- Net calorific value of bagasse.
- Average net energy efficiency of heat generation in the boiler.

The main data to be monitored for determining the emissions reductions is the net electricity generated by the plant. The emissions reduction is reached by applying an emission factor through the net electricity.

During the desk study, the following NIRs and CARs regarding the monitoring plan were raised:

- CAR 09: The description of the Monitoring Plan did not include complete information about records and archiving, as required for CDM projects.

To close out CAR 09, it was informed that all the monitoring parameters will be archived for two years from the end of the crediting period. This information was included in the revised PDD, section B.7.1 (tables of parameters to be monitored). CAR 09 was closed out.

- NIR 10: It was informed in the PDD that the measurement of the energy exported to the grid will be done by electronic redundant meters. Although the information above was provided, it was not clear in the description of the Monitoring Plan what should be done about data adjustment or missing data.

To clarify NIR 10, the following information was included in the revised PDD (page 37) "*The measurement of the energy generated to the grid will be done by two three-fase four wire electronic redundant meters, model ELO.2180. They will be installed in metallic panels inside Companhia Bioenergética Santa Cruz 1 and 2 control room. Since the system is redundant, if there is any problem with the meter which is used to collect data for energy sales invoice, measurements will be taken from the second meter. If both have problems, Santa Cruz will have additional ELO.2180 meters, one for each generator, which will be used for internal control".*

NIR 10 was closed out.

- CAR 11: The description of the Monitoring Plan did not include procedures for internal audits or for review of data before submission internally or externally.
This information was included in the second version of the PDD, in section B.7.2. It was informed in the revised PDD that "*Since Santa Cruz S.A – Açúcar e Álcool is certified for both ISO 9001 (including the production of electrical energy) and ISO 14001, all procedures for internal audits will be done according to those standards*". It was confirmed on site that there are procedures in place for internal audits. Copies of the certificates were provided (Ref. 35 and 36) CAR 11 was closed out and Observation (1) was raised: the procedures for internal audits should be updated to include all aspects related to the CDM project, besides the operational issues of the cogeneration plant. Revised procedures should be available before the first crediting period.

- CAR 14: The information provided for data and parameters monitored is incomplete (tables of section B.7.1). It is not provided the description of measurement methods and procedures to be applied for EGproject plant$_y$. It was not informed the QA/QC procedures to be applied for EG_y (Net quantity of increased electricity generation as a result of the project activity). The monitoring of NCVbiomass and of the efficiency did not comply with ACM0006 version 6 requirements. In addition, it was not included the monitoring of moisture content of the biomass.

To close out CAR 14, the PDD was revised to include the missing information. Measurement procedures to be applied for EGproject plant were described. EGy is a calculated value, depending on (1) EGproject plant, (2) the reference plant electricity efficiency and (3) the project plant electricity efficiency. These measured values already have their own QA/QC procedures, so it was justified that the calculation of EGy does not need specific procedures. The monitoring of NCVbiomass and boiler efficiency was revised to comply with ACM0006. It is informed that it will be done by independent laboratories. The monitoring of moisture content of the biomass was included in the PDD (Section B.7.2). This parameter is monitored by Santa Cruz, as described in the Monitoring Plan, using calibrated equipment (copy of the balance certificate was provided, see Ref. 31). CAR 14 was closed out.

- NIR 15: Information about calibration of meters to be used for measurement of the amount of biomass combusted in the project and for measurements of NVC and moisture content of bagasse were not provided in the description of monitoring plan.

The PDD was revised. Additional information was included under the Description of Monitoring Plan and in the table related to each monitored parameters. It was informed that the calibration of the

electricity meters will be done according to the regulations of ANEEL, *Procedimentos de Distribuição de Energia Elétrica no Sistema Elétrico Nacional – PRODIST – Módulo 5 – Sistemas de Medição*, document PND1A-DE8-0550 (October, 2005). The quality management system implemented in Santa Cruz covers the calibration and maintenance of all meters and monitoring devices used in the plant.

Observation (2) was raised: Although the NCV of bagass will be determined by external laboratories, Santa Cruz should be responsible to assure that these laboratories are accredited to perform this kind of analysis and the calibration certificates of the devices used should be available if requested. The external laboratory should comply with ACM0006 that requires monitoring at least every six months, considering at least 3 samples of each measurement.

The CARs and NIRs were addressed appropriately. The final monitoring plan described in the PDD, with the support with the internal management system already in place in Santa Cruz plant was considered as in line with good monitoring practices.

3.5 Project design

The project design engineering reflects current good practices. It will be applied direct combustion technologies. It involves the oxidation of biomass with excess air in a process that generates hot gases that are used to produce steam in boilers. The steam is used to produce electricity in a Rankine cycle turbine.

The project will replace old equipment and will operate with a new configuration, in two phases: the first phase, starting in 2008, and the second, in 2009 (see chronogram of project implementation, Ref. 22). The project will operate (phase 1) using 1 boiler, 1 generator and 1 turbo-generator (25MW). In the phase 2 (2009), more 2 boilers, 2 generators and 2 turbines will be installed (25MW each one), totalizing 75MW. The information about specification of the equipment and installed capacity was confirmed on-site and by document review (Ref. 19 and Ref. 21). The technology to be employed is one of the most known options for simultaneous power and heat generation from biomass.

It was assumed a renewable crediting period of 7 years, starting on 01/09/2008. The operational lifetime will be 25 years, which exceed the crediting period.

The project correctly applied the PDD template (version 03.1). No changes in the document were observed. The specific requirements were addressed under each header of the template.
The following issues were raised, regarding the description of the project activity:

CAR 1: During the desk study, it was verified that the table which indicated the estimated projected emission reductions was not correctly complete. It indicated the starting period in 2007, which did not comply with the starting date of the crediting period informed in Section C of the PDD.

To close out CAR 1, the PDD was revised and Table 1 was corrected. The estimation starts in 2008, consistent with the starting date of the crediting period informed in the PDD (01/09/2008). CAR 1 was closed out.

NIR 12: The PDD version 1 informed the starting date of the project as 01/01/2008. It is not clearly justified why the starting date was defined as such, once the project was planned and submitted to the governmental agencies (CETESB and ANEEL) before this date. To clarify NIR 12, the PDD was revised and the date informed (01/01/2008) was changed to 24/08/2006. It was evidenced that on that date the directors of Santa Cruz approved the investments on the cogeneration plant, considering the opportunity of the CDM (copy of the directors meeting notes were provided, see Ref. 10). The date corrected date was mentioned in the revised PDD, section C.1.1. NIR 12 was closed out.

3.6 Environmental Impacts

Santa Cruz plant is covered by the Operating License nº 28002148 (24/03/2008) issued by *CETESB – Companhia de Tecnologia de Saneamento Ambiental* (environmental agency of the state of São Paulo).

During the site visit, copy of the project's Preliminary License (LP 01108 issued by SMA/SP) was provided to the auditors (Ref. 16). It was also evidenced that Santa Cruz requested the installation license to cover the next phase of the project implementation (request sent to CETESB on 06/09/2007, see Ref.17).

Observation 3: The environmental licenses related to the project implementation and operation should be available before the first verification assessment.

The environmental assessment report was provided during the validation (Ref.18). Mitigation measures and a monitoring plan were proposed for the impacts identified (mainly related to emissions from the boilers). The project manager provided information that the monitoring of environmental impacts will be carried out according to the requirements of the State Environmental Agency.

In addition, the project is covered by the following licenses, issued by ANELL:

- Nº 330, issued on 12/02/2007 – the energy agency authorizes the installation of the first phase with 25.000kWh (Ref.33a)

- Nº 331, issued on 12/02/2007 – the energy agency authorizes the installation of the second phase with 25.000kWh. (Ref.33b)

- Nº 3.288, issued on 3/11/2007 – the energy agency authorizes the installation of the third phase with 25.000kW/h. (Ref.33c).

3.7 Local stakeholder comments

Local stakeholders were invited by letters to comment on the Santa Cruz S.A – Açúcar e Álcool – Cogeneration Project. The invitation was sent to specific stakeholders, considered representative of the general public, as defined by Resolution n° 1 of the DNA. The following stakeholders were contacted:

- The city hall of Américo Brasiliense;
- The municipality chamber of Américo Brasiliense;
- The attorneys' office of the State of São Paulo;

- The Brazilian NGO Forum (FBOMS – *Fórum Brasileiro de ONGs e Movimentos Sociais para o Desenvolvimento e Meio Ambiente*);
- The state environmental agency of São Paulo (CETESB);
- The municipality's environmental authority of Américo Brasiliense;
- Local Cultural Association Cidade Doçura

It was verified by the local assessor that Santa Cruz submitted these letters on 20/07/2007. Copies of letters and records of posting were provided to SGS (Ref. 39 and Ref.40). The letters informed contact details where additional information about the project could be obtained.

No concerns were received during the consultation process. A letter was received from the city hall of Américo Brasiliense, supporting the implementation of the project (Ref.41).

4. 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.

4.1 Description of how and when the PDD was made publicly available

The PDD and the monitoring plan for this project were made available on the UNFCCC website *http://cdm.unfccc.int/Projects/Validation/DB/Q2NPZQR1719T8RGDX8M8WNV3X9NU92/view.html* which is linked to SGS website and were open for comments from 4 September 2007 to 03 October 2007. Comments were invited through the UNFCCC CDM homepage

4.2 Compilation of all comments received

No comments were received by DOE during the 30 days commenting period.

4.3 Explanation of how comments have been taken into account

No comments were received.

5. Validation opinion

Actions have been taken to close out 16 findings. The outstanding observations does not preclude the validation process, but should be addressed before the starting date of the credit period.

SGS has performed a validation of project: Santa Cruz S.A – Açúcar e Álcool – Cogeneration Project. The validation was performed on the basis of the UNFCCC criteria and host country criteria, as well as criteria given to provide consistent project operations, monitoring and reporting. Using a risk based approach, the validation of the project design documentation and the subsequent follow-up interviews have provided SGS with sufficient evidence to determine the fulfilment of the stated criteria.

By increasing the efficiency of a cogeneration plant using sugar cane bagass as biomass, the project will generate enough energy not only for powering the sugar mill but also for delivering surplus energy to the national grid. The project results in reducing greenhouse gas emissions that are real, measurable and give long-term benefits to the mitigation of climate change. A review of

the investment analysis and barriers presented demonstrates that the proposed project activity was 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. If the project is implemented as designed, the project is likely to achieve the estimated amount of emission reductions of 401,596 t CO_2e during the first crediting period (7 years).

The validation is based on the information made available to SGS and the engagement conditions detailed in the report. The validation has been performed using a risk based approach as described above. The only purpose of this report is its use during the registration process as part of the CDM project cycle. Hence SGS can not be held liable by any party for decisions made or not made based on the validation opinion, which will go beyond that purpose.

6. List of persons interviewed

Date	*Name*	*Position*	*Short description of subject discussed*
8 – 9 October 2007	Ana Paula Veiga	Consultant/Ecoinvest	Validation process and findings. Technical issues, operational issues, investment analysis, monitoring plan, baseline emission factor.
	Roberto Beraldo	Financial coordinator /Santa Cruz	Financial issues related to the project
	Rudiney Sergio Pestana	Environmental Coordinator /Santa Cruz	Environmental and quality management system; environmental impacts
	Andréia Ap. Guerra	Coordinator/ Santa Cruz	Environmental licenses applicable to the plant
	Marcos Helder P. Monaco	Industrial Manager/Santa Cruz	Tecnhical issues, plant operation
	Adriano Brisolari	Agriculture Analist/Santa Cruz	Operation issues

7. Document references

Category 1

/1/ Project Design – Santa Cruz S.A – Açúcar e Álcool – Cogeneration Project, version 1 - 29/08/2007, version 2 - 19/10/2007, version 3 – 29/10/2007, version 4 – 22/11/2007, version 5 – 23/11/2007, version 6 – 30-01-2008, version 7 – 19/03/2008, version 8 – 02/07/2008, version 9 – 10/07/2008.

/2/ Consolidated baseline and monitoring methodology for grid-connected electricity generation from biomass residues – ACM0006, version 06.

/3/ Consolidated baseline and monitoring methodology for grid-connected electricity generation from renewable sources – ACM0002, version 6.

/4/ Tool for the demonstration and assessment of additionality, version 5.

Category 2

/5/ Cash flow spreasheet (Investment analysis and sensitivity analysis)

/6/ Santa Cruz_calculation CERs_2007.11.24 (Emission reduction estimative)

/7/ BR-Grid EF SSECO-2004 to 2006-2007.07.30 b (calculation of EF grid)

/8/ Auxiliary system spreadsheet (consumption by auxiliary system of the plant)

/9/ Reference Plants_Efficiency
/10/ Starting date (investments approved by Santa Cruz)
/11/ PPA (Power Purchase Agreement)
/12a/ TUSD_TUST (costs of kW)
/12b/ Beta Cosan (one of the data used for calculation of WAAC – investment analysis)
/13/ Investments approved by Santa Cruz
/14/ Revenues from the sale of electricity
/15/ Energy in the Free Market (prices of energy)
/16/ Previous Environmental License
/17/ Request for Installation license
/18/ Environmental report
/19/ Specification of Turbo-generator
/20/ Turbo-generator – efficiency
/21/ Specification Boiler 150 tvh - 65 kgf – 480
/22/ Chronogram of the implementation UTE Santa Cruz
/23/ Efficiency of boilers
/24/ Sugarcane, sugar and alcohol production
/25/ Sugarcane available_2007
/26/ Electricity meter specifications
/27a/ DAEE (coordinate reference)
/27b/ Coordinates
/28/ Heat efficiency of the boiler
/29/ Enthalpy of the bolier
/30/ Iplan - use of biomass in the boiler
/31/ Calibration Cetec (certificate of calibration of the scale)
/32/ Agreement EcoC_Santa Cruz
/33a/ ANEEL license 330
/33b/ ANEEL license 331
/33c/ ANEEL license 3.288
/34/ Work instructions (plant operation procedure)
/35/ ISO 9001 _Santa Cruz_2005_600 (quality management system certificate)
/36/ ISO 14001_Santa Cruz_2005_600 (environmental management system certificate)
/37/ Crop season report
/38/ Organization Chart of Santa Cruz
/39/ Letter to Local stakeholders

/40/ Santa Cruz_ARs (mailing receipts)

/41/ Response from a local stakeholder

/42/ Capacity factor 85%

/43/ Operation license N°28002148, issued by Cetesb.

/44/ CDM Consideration

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VAL 1274 - Santa Cruz S.A. - Açúcar e Álcool - Cogeneration Project - Annex 1 - Local assessment checklist

This checklist is designed to provide confirmation of in-country data and information provided in the Project Design Document. It serves as a "reality check" on the project. It is to be completed by a local assessor from SGS Brazil

Issue	Findings	Source /Means of Verification	Further action / clarification / information required?
Confirm details of the project as informed in the PDD (pages 7-10 PDD version 1): "the project Phase 1 will operate using 1 boiler, 1 generator and 1 turbine (25 MW). Phase 2, it will operate with 3 boilers, 3 turbines and 3 generators (25MW each one)".	Confirmed the details of the project activity through: - turbogenerator: 63 bar, Tº 480, 140,1ton/h, 25.000kW installed capacity for each set. (see Ref.19 and Ref. 20 for specifications) Turbine Model SST300 with efficiency of 88,4% Turbine + generator Model SST 300 with efficiency of 85% Turbine SST300 PAC with efficiency of 81% Turbine SST300 PAC with efficiency of 79% - Metering energy: 4 meters ELO 2180 (Ref. 26) - Boilers Iplan: 804,7 kcal /kg of enthalpy, 150 tv/h, 65 kgf/cm^2 and 480ºC. (reference Iplan) (Ref. 29) Boiler uses only biomass as fuel. It was presented a document from Iplan that evidences this affirmation (Ref.30) The installed capacity is accordance with ANEEL licenses (Ref. 33a, b.c). It was verified and confirmed the chronogram (Ref.22) of implementation of the project activity	Site visit/DR	OK

Issue	Findings	Source /Means of Verification	Further action / clarification / information required?
Confirm the location and specifications of the project, as described in the PDD. Inform details of evidences verified on-site.	The site was visited. The location of the plant was correctly described in the PDD (Ref.27 (a) and (b)).	Site visit/DR/I	OK

Issue	Findings	Source /Means of Verification	Further action / clarification / information required?
Confirm the baseline context: which plant is current installed?	It was confirmed by local assessor during site visit that currently Santa Cruz is generating energy for its internal consumption (heat generation). It was possible to confirm through the internal system (energy generation). During site visit, the plant was generating 9.90MW/h. This value is coherent with installed capacity of 12,2MW. The internal report verified during the site visit demonstrated an efficiency of the boilers around 85,2% (Ref.23). It was verified on site visit by local assessor that specifications of equipments of the baseline correspond to description showed in the PDD. The total cane milled/day was confirmed from crop season reports verified on site (Ref. 37). Regarding the social and environmental programs, these activities were implemented before the project activity. During site visit was presented the "Production worksheet" that shows that the production for sugar mill has increased due to natural expanding business. The table 2 of the PDD was correctly applied.	Site visit/DR	OK
Confirm on-site and ask evidences for the following information: *Heat efficiency for the 7 boilers of the baseline is 6,000 KJ/Kg bagasse; for the boilers of the project, heat efficiency is 7,493 KJ/Kg bagasse.*	Heat efficiency for the boilers of the baseline is 2,54kg vapor/kg bagasse . According to Iplan (boiler supplier), the enthalpy is 804,7 kcal /kg to the boiler of 65kgf/cm2, 480ºC (Ref.28 and Ref. 29).	Site visit/DR/I	OK

Issue	Findings	Source /Means of Verification	Further action / clarification / information required?
Confirm if the biomass is produced on-site and that is not needed transportation (with fuel consumption)	It was confirmed through observation and interviews that the biomass is produced on site. No need of transportation.	Site visit/I	OK
Confirm if the bagasse is stored for less than 1 year	Through interviews with operators was confirmed that bagasse is not stored for more than 1 year, however in the "season report" (Boletim de safra, 2005, 2006 and 2007) was verified that the surplus of bagasse residue, which was not used y facility, was sold. The bagasse which has been sold corresponds to less than 2% and it is not used as energy generation for the purchasers (Ref.37)	Site visit/DR/I	OK
Efficiency of the reference plant: verify the following data informed in the PDD, page 30: *Plant A (started operations in June/2006) – efficiency: 3.09%* *Plant B (started operations in May/2006) – efficiency: 3.47%* *Plant C (started operations in April/2005) – efficiency: 3.63%* *Taking the average efficiency of these plants: εel, reference plant =*	It was confirmed the efficiency of the reference plant through following sources (see also Ref. 9 for calculation of the net average of reference plant electricity efficiency) Plant A: Installed capacity and started operation, information obtained from Operation License, Nº 176/2006, issued by Instituto Pantanal; Energy generation: information obtained with the plant manager. NCV bagasse: information obtained from similar project; Bagasse quantity: information obtained from Portal Unica. Plant B: Installed capacity and started operation, information obtained from ANEEL document, Nº 48500.004929/2005-54, issued in 2007. Energy generation: information obtained with the plant manager. NCV bagasse: information obtained from similar project;	Site visit/DR/I	OK

Issue	Findings	Source /Means of Verification	Further action / clarification / information required?
0.034	Bagasse quantity: information obtained from Portal Unica. Plant C: Installed capacity and started operation, information obtained from ANEEL document, Nº 48500.004145/04-63, issued in 2005. Energy generation: information obtained with the plant manager NCV bagasse: information obtained from similar project. Bagasse quantity: information obtained from Portal Unica.		

Issue	Findings	Source /Means of Verification	Further action / clarification / information required?
Give evidences of who is the responsible part of the project. Verify: social contract of the Santa Cruz S.A. - Açúcar e Álcool that evidences that the company is formally constituted and that is the owner of the plant. Verify contract between Santa Cruz and Ecoinvest (evidencing that Ecoinvest is allowed and project participant). Confirm if the company's name is shown in ANEEL licenses or environmental licenses.	As defined in the PDD, the project participants are Santa Cruz S.A Açúcar e Álcool and Ecoinvest Carbon Brasil Ltda. (see the forma agreement between the part in Ref. 32). ANEEL and Environmental license mentions the correct company's name.	Site visit/DR/I	OK
Confirm what data was used for estimate the energy produced annually (is applied some capacity factor??). How many MWh the plant will generate/year?	The estimation for the energy produced annually was calculated considering: - installed capacity of 75MW - Capacity factor of 0.85 - crop season of 210 days - 24 hours/day Calculation: energy generated: = capacity factor*crop season*hours*installed capacity	Site visit/DR/I	OK

Issue	Findings	Source /Means of Verification	Further action / clarification / information required?
	(see complete data and formula used in Ref. 6). The consumption of auxiliary system represents 3124.32KW.((auxiliary system). 3.124MW*24hours* 0,85 capacity factor* 210 days crop season = 13.384MWh (see Ref. 8).		
Check which evidences confirm the project starting date.	The PP proved that the starting date (28/09/2006 – ref. 10 – page 4) refers to investment approved by Santa Cruz relating to order of major equipment (boiler of 150t/h) – ref.10.	Site visit/DR	OK
Verify ANEEL (Brazilian Electricity Regulatory Agency) license.	Verified 3 ANEEL licenses: Nº 330, issued on 12/02/2007 – the energy agency authorizes the installation of the first phase with 25.000kWh (Ref.33a) Nº 331, issued on 12/02/2007 – the energy agency authorizes the installation of the second phase with 25.000kWh. (Ref.33b) Nº 3.288, issued on 3/11/2007 – the energy authorizes the installation of the third phase with 25.000kW/h. (Ref.33c)	Site visit/DR	OK
Confirm the financing from BNDES (what % of the project?). Confirm the interest rate applied by BNDES, as informed in the PDD: 10.17% (it should be documented!) Ask copies of evidences.	The financing from BNDES is in process. According to project participants, the financing will be approved at the start 2008. For to be conservative the interest rate applied by BNDES is 10.17%. Hard copy was provided during the validation assessment and confirmed by local assessor and lead assessor.	Site visit/DR/I	NIR 16

Issue	Findings	Source /Means of Verification	Further action / clarification / information required?
Confirm by document review, interviews and on-site observations If there are some monitoring procedures implemented (responsibilities, procedures and work instructions, archiving time, calibration and maintenance of the meters:. Please provide detailed evidences (if possible, copies of calibration certificates, copies of procedures or work instructions etc).	Santa Cruz plant has its quality management system and environmental management system certified (certificate ISO 9000, Ref. 35 and ISO 14001, Ref.36). The procedures relate to calibration, work instructions are implemented. The following procedures were verified on site: - Instrução de trabalho: Controle de Pesagem, IT.4.11301-02, 29/09/2006. (weigh of sugar cane) - Recepção e Análise de Matéria Prima – PINISC/S, IT 4.700-03, 06/10/2006 (receiving and analysis of raw material) - Análise de umidade, D.I. 4.700.01.05, 27/10/2007 (moisture content analysis). - Calibration of the meters: Procedimentos de Distribuição de Energia Elétrica no Sistema Elétrico Nacional – PRODIST – Módulo 5 – Sistemas de Medição, document PND1A-DE8-0550, of October 20, 2005. There are Operational procedures for boiler operation and steam generation (Works instructions, P.4.410-05, 14/10/2007.- Ref.34).	Site visit/DR/I	OK
Check current and projected management structure for the plant. Verify: authority and responsibility and training of personnel.	The Integrated Management Coordinator is responsible for the plant, as well as for the training The responsibilities are clearly defined (se plant organizational chart, Ref. 38).	Site visit/DR/I	Observation (1) : the procedures for internal audits should be updated to include specific aspects related to the CDM project, besides the operational issues of the plant. Revised procedures should be available

Issue	Findings	Source /Means of Verification	Further action / clarification / information required?
			before the first crediting period
If there are some measurements in place, ask copies of the meters calibration certificate	The electricity meters are not installed, but was presented the purchase orders indicating the model and specifications of the meters (Ref. 26). Confirmed the calibration of the scale of moisture content (balança de umidade), Nº BP849/07, issued by CETEC on 30-05-2007. (Ref .31). Regarding the weighbridges, it was verified that there are scales for sugarcane. The truck with sugar cane is weighed and the data is processed automatically by the internal system ("Pesagem de Cana – entrada/saída de caminhões"). A sample of sugar cane is analyzed to obtain the moisture content. It was verified 4 weigh bridges (50 tones capacity each one) and its calibration certificate: - Toledo do Brasil: serial number 85503, certificated by INMETRO on 26/09/2007, certificate number 775901. - Toledo do Brasil: serial number 85504, certificated by INMETRO on 25/09/2007, certificate number 775908. - Toledo do Brasil: serial number 85505, certificated by INMETRO on 25/09/2007, certificate number 775907. - Toledo do Brasil: serial number 85506, certificated by INMETRO on 26/09/2007, certificate number 775909. Error < 0,04%. The calibration is carried out yearly.	Site visit/DR/I	Observation (2): Although the NCV of bagass will be determined by external laboratories, Santa Cruz should be responsible to assure that these laboratories are accredited to perform this kind of analysis and the calibration certificates of the devices used should be available if requested.
Check data about the	Please, see above (reference plants).	Site visit/DR	OK

Issue	Findings	Source /Means of Verification	Further action / clarification / information required?
”reference plant” (revised PDD to comply with version 6 of ACM0006)			
Confirm and ask documented evidences for each value used for Cost of Equity(Ke) calculation and WACC calculation (PDD, page 17). Is it possible to confirm that the WACC (Weighted Average Cost of Capital) is equal to 11.13% p.a., as informed in the PDD?	All data of the WACC was confirmed during the validation assessment. All sources of data were provided by Santa Cruz (see Ref. 5, 11, 12,13,14,15). See also NIR 16 close out details.	Site visit/DR/I	Ok
Ask the complete spreadsheet used for financial analysis. Verify evidences of prices of energy used in the investment analysis. Verify all costs informed and check sources of data.	The benchmark and cash flow worksheet (Ref. 5) was provided. All evidences were checked. The IRR of the project activity is lower than WACC benchmark. Follow bellow the evidences verified: ➢ Costs: TUSD: ANEEL, Nº 445, 3/3/2007 (Ref.12a) ➢ Investments approved by Santa Cruz R$ 131,063,500.00 Ref.13 ➢ SELIC Rate of 12.3% ➢ Verified and confirmed all taxes of cogeneration (ANEEL, TUSD, TUST, MAE, ONS, and CCEE, Brazilian taxes). ➢ Expected financial taxes ➢ Prices of energy:	Site visit/DR/I	Ok

Issue	Findings	Source /Means of Verification	Further action / clarification / information required?
	Free market = R$ 119.00/MWh (Ref.15) PPA = R$ 143.09/MWh (Ref. 11). See also NIR 16 close out details.		
PDD, page 19 mentioned: *"For the Santa Cruz – Açúcar e Álcool cogeneration project, the sale of electricity represents 7.5 % of the total net revenues"* .	Verified that the estimative of total net revenues with the sale of electricity is around 8.6%. (Ref.14). See also NIR 5 close out details. All data discussed in spreadsheet were checked by local assessor.	Site visit/DR	Ok
Verify the environmental licensing process. Check the environmental studies (if there is a PCA, a RAP or other required by CETESB). Check the current operation license and the conditions defined by the environmental agency. Record the details of all relevant documents verified on-site and ask copies.	It was presented an environmental study, called "Plano de Melhoria Ambiental – estudo de dispersão atmosférica – Environmental Report" which objective is to control the emission of air pollution (Ref.18) The Operation license was issued on 24/03/2008 (ref.43); Previous license is available in (Ref.16) and Installation license (Ref.17).	Site visit/DR	Observation 3: The environmental licenses related to the project implementation and operation should be available before the first verification assessment.

Issue	Findings	Source /Means of Verification	Further action / clarification / information required?
Check the calculation of OM, BM and the emission factor of the grid (formulas and data used for the calculation). Ask for the complete spreadsheets with data used for the calculation and for reaching the value of EF=0.2611 Ask copy of this spreadsheet.	Confirmed the Emission Factor Spreadsheet. The calculation was correctly applied. Copy of the spreadsheet was provided (Ref.7). See also NIR 8 and CAR 13 close out details. The value calculated is EF = 0,2826 t CO2e/MWh.	Site visit/DR	Ok
Confirm the data used and presented in the PDD, section B.6.3 "Ex-ante calculation of emission reductions" (pages 28-29).	Concerning the ex-ante data showed in the CERs spreadsheet was confirmed as described above (see Ref. 6)	Site visit/DR	OK
Confirm the names of each stakeholder invited to comment on the project.	Confirmed the name of the local stakeholders invited. ➢ Américo Brasiliense City Hall ➢ Municipal Assembly of Américo Brasiliense ➢ Environmental Agency of Américo Brasiliense ➢ Local Cultural Association Cidade Doçura ➢ Environmental Agency of the State of São Paulo ➢ State Attorney for the Rights of Citizens of the State of São Paulo	Site visit/DR	OK

Issue	Findings	Source /Means of Verification	Further action / clarification / information required?
	➢ Brazilian Forum of NGOs and Social Movements for the Development and Environment		
Confirm the letter and material sent to the stakeholders (language, media etc).	Confirmed the AR's sent (July 2007) (Ref. 40) to the local stakeholders by local assessor during site visit. The communication used in the letter included information relevant about the project (Ref.39).	Site visit/DR	OK
Check the responses and comments received from the stakeholders mentioned in the PDD.	One comment received from Américo Braziliense City Hall, which is supportive to the project. No response or clarification was needed (Ref.41).	Site visit/DR	OK

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VAL 1274 - Santa Cruz S.A. - Açúcar e Álcool - Cogeneration Project - Annex 2 – Validation Protocol

REQUIREMENT	REFERENCE	Comments	CONCLUSION
1. All Parties (listed in Section A3 of the PDD) have ratified the Kyoto protocol and are allowed to participate in CDM projects	Marrakech Accords, CDM Modalities §30	There are two private entities involved in the project activity: • Santa Cruz S.A.-Açúcar e Álcool (Private entity) • Ecoinvest Carbon Brasil Ltda (Private entity) The only Party involved in this project is Brazil, which has ratified the Kyoto Protocol in 23 August 2002. *http://maindb.unfccc.int/public/country.pl?country=BR*	OK
2. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3 and be entered into voluntarily.	Marrakech Accords, CDM Modalities §29 and §30	No Annex 1 is included in this project.	OK
3. 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	Marrakech Accords, CDM Modalities §29 and §30 Kyoto Protocol Art. 12.2, Marrakech Accords, CDM Modalities §40a	No letter of approval was issued by Brazil (report should be sent to DNA)	Pending, LoA will be issued after analysis of the validation report by DNA.

REQUIREMENT	REFERENCE	Comments	CONCLUSION
4. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available	Marrakech Accords, CDM Modalities, §40	PDD available at: http://cdm.unfccc.int/Projects/Validation/DB/Q2NPZQR1719T8RGDX8M8WNV3X9NU92/view.html Period of consultation: 04 Sept to 03 October 2007. No comments were received	Ok
5. The project design document shall be in conformance with the UNFCCC CDM-PDD format	Marrakech Accords, CDM Modalities, Appendix B, EB Decisions	PDD template version 3 was applied (current version). The project design document was completed in the current UNFCCC PDD template.	Ok
6. The project participants shall submit a letter on the modalities of communication (MoC) before submitting a request for registration	EB-09 F_CDM_REG form	Project Participant will provide the document after the validation approval.	
7. For AR projects, the host country shall have issued a communication providing a single definition of minimum tree cover, minimum land area value and minimum tree height. Has such a letter been issued and are the definitions consistently applied throughout the PDD?		Not applicable (N.a.)	N.a.

CHECKLIST QUESTION	Ref. ID	MoV*	COMMENTS	Draft Concl	Final Concl
A. General Description of Project Activity					
A.1. Project Title					
A.1.1. Does the used project title clearly enable to identify the unique CDM activity?	1	DR	Yes, the title is the name of the plant: "Santa Cruz S.A. - Açúcar e Álcool - Cogeneration Project."	Ok	Ok
A.1.2. Are there an indication of a revision number and the date of the revision?	1	DR	During the desk study, PDD version number: 1 and Date: 29/08/2007. At the final validation: PDD version: 9 and Date:10/07/2008	Ok	Ok
A.1.3. Is this in consistency with the time line of the project's history?	1	DR	Yes. The project will be in operation in 2008.	Ok	Ok
A.2. Description of the project activity					
A.2.1. Is the description delivering a transparent overview of the project activities?	1	DR	Yes. In the section A.2 of the PDD it was informed the primary objectives of the project activity and provided a description and a diagram of the process of energy generation from sugar cane bagass. It is also provided information about how the project can contribute to the local sustainable development.	Ok	Ok
A.2.2. Is all information provided in compliance with actual situation or planning?	1	DR, S		To be confirmed	Ok

CHECKLIST QUESTION	Ref. ID	MoV*	COMMENTS	Draft Concl	Final Concl
A.2.3. Is all information provided consistent with details provided in further chapters of the PDD?	1	DR	Yes.	Ok	Ok
A.3. Project Participants					
A.3.1. Is the table required for the indication of project participants correctly applied?	1	DR	Yes. The names and status of the participants were confirmed	Ok	Ok
A.3.2. Is all information provided in consistency with details provided by further chapters of the PDD (in particular annex 1)?	1	DR	The information provided in the Section A.3 of the PDD complies with the Annex 1.	Ok	Ok
A.4. Technical description of the project activity					
A.4.1. Does the information provided on the location of the project activity allow for a clear identification of the site(s)?	1 27a 27b	DR	The following information was provided in the PDD and was confirmed on-site: the plant is located in Américo Brasiliense – coordinates N (m) 7591422 and E (m) 802293 , in the central part of São Paulo state, at 280 km from São Paulo, at Km 70 from road SP 255.	To be confirmed	Ok
A.4.2. Do the project participants possess ownership or licenses which will allow the implementation of the project at that site / those sites?	1 16 32 33a 33b 33c	DR	Verified licenses issued by CETESB and ANEEL. Verify the agreement between Santa Cruz and Ecoinvest Carbon.	To be confirmed	Ok

CHECKLIST QUESTION	Ref. ID	MoV*	COMMENTS	Draft Concl	Final Concl
A.4.3. Is the category(ies) of the project activity correctly identified?	1	DR	Yes, it is informed in the PDD: Type: Energy and Power; Sectoral Scope: 1 – Energy industries (renewable - / non-renewable sources); Category: Renewable electricity generation for a grid (energy generation, supply, transmission and distribution).	Ok	Ok
A.4.4. Does the project design engineering reflect current good practices?	1 19 20 21 30	DR/ S	Yes. It will apply the “Rankine cycle turbine”. The technology employed is probably the most known option for simultaneous power and heat generation from biomass. As informed in the PDD (pages 7-10 PDD version 1), the project Phase 1 will operate using 1 boiler, 1 generator and 1 turbine (25 MW). Phase 2, it will operate with 3 boilres, 3 turbines and 3 generators (25MW each one). The configuration and specification of the equipment were confirmed on-site.	To be confirm ed	Ok
A.4.5. Does the description of the technology to be applied provide sufficient and transparent input to evaluate its impact on the greenhouse gas balance and is the explanation how the project will reduce greenhouse gas emission transparent and suitable?	1	DR/ S	It will be applied direct combustion technologies. It involves the oxidation of biomass with excess air in a process that generates hot gases that are used to produce steam in boilers. The steam is used to produce electricity in a Rankine cycle turbine. This technology will produce electricity from renewable resources (biomass) considered as “zero” emissions.	Ok	Ok

CHECKLIST QUESTION	Ref. ID	MoV*	COMMENTS	Draft Concl	Final Concl
A.4.6. Is all information provided in compliance with actual situation or planning as available by the project participants?	1	DR/ S	Details about the project, as location, capacity, type of biomass to be used and references mentioned in the PDD were confirmed on-site by the local assessors.	To be confirm ed	Ok
A.4.7. Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country?	1	DR	The technology employed is probably the most known option for simultaneous power and heat generation from biomass.	Ok	Ok
A.4.8. Is the project technology likely to be substituted by other or more efficient technologies within the project period?	1	DR	It is not expected.	Ok	Ok
A.4.9. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period?	1	DR/ S/I	No. The plant already has a cogeneration unit in operation. Workers were trained and for the expansion of the plant, no extensive training or maintenance efforts were required.	To be confirm ed	Ok
A.4.10. Does the project make provisions for meeting training and maintenance needs?	1	DR/ S/I	See comments above in A.4.9.	To be confirm ed	Ok
A.4.11. Is a schedule available on the implementation of the project and are there any risks for delays?	1 13 16 22 33 (a,b, c)	DR	It was verified on site the chronogram and plan of action for implementation of the project phase 1 (2008) and phase 2 (2009). Checked: budget approved, engineering projects, and purchased orders. The preliminary license was issued by the environmental agency. The license for energy production was also issued by ANEEL.	To be confirm ed	Ok

CHECKLIST QUESTION	Ref. ID	MoV*	COMMENTS	Draft Concl	Final Concl
A.4.12. Is the table required for the indication of projected emission reductions correctly applied?	1	DR	No. It indicated the starting period in 2007, which does not comply with the project starting date and starting date of the crediting period informed in Section C of the PDD. CAR 1 was raised. Table 1 in the revised PDD is now complying with the starting date of the crediting period (01/04/2008). CAR 1 was closed out.	CAR 1	Ok
A.5. Public Funding					
A.5.1. Does the information on public funding provided conform with the actual situation or planning as presented by the project participants?	1 13	DR/I/S	Yes. The project will be partially financed by the owner and the other part will be financed by a Brazilian financial entity. There are no foreign donors for the project.	To be confirmed	Ok
A.5.2. Is all information provided consist with details provided by further chapters of the PDD (in particular annex 2)?	1	DR	Yes.	Ok	Ok
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	1	DR	No ODA have been provided for this project. The Project will be financed by BNDES - Banco Nacional de Desenvolvimento Econômico e Social (Brazilian Development Bank).	To be confirmed	Ok

CHECKLIST QUESTION	Ref. ID	MoV*	COMMENTS	Draft Concl	Final Concl
B. Baseline and Monitoring Methodology					
B.1. Choice and Applicability					
B.1.1. Is the baseline methodology previously approved by the CDM Methodology Panel?	2 3	DR	Yes, it is applied ACM0006, version 06. "Consolidated methodology electricity generation from biomass residues" It was confirmed that version 6 is the current one. For calculation of the Emission Factor of the grid, it is applied ACM0002 - "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", Version 6, dated on 19/05/2006, which is also the current one.	Ok	Ok
B.1.2. Is the baseline methodology the one deemed most applicable for this project?	1 2 3	DR	The methodology is applicable to grid-connected and biomass residue fired electricity generation project activities, including cogeneration plants.	Ok	Ok
B.1.3. Is the choice of the methodology correctly justified by the PDD and is the project in conformance with all applicability criteria of the applied methodology?	1 2	DR/ S	The following applicability criteria and conditions were discussed in the PDD and were confirmed on-site: Santa Cruz project consists in the improvement of energy efficiency of an existing power plant (energy efficiency improvement projects), by installing a more efficient plant that replaces the existing plant. - The primary fuel in the project plant is a biomass consisting of sugar cane bagasse, to be generated in the same facility as a by-	To be confirmed	Ok

CHECKLIST QUESTION	Ref. ID	MoV*	COMMENTS	Draft Concl	Final Concl
			product of the sugar production; - the implementation of the project shall not result in an increase of the processing capacity of raw input or other substantial changes in the process; - the bagasse will be stored for less than one year. The biomass used in this project will not be transformed in any way before being used as a fuel. The combinations of project activity and baseline scenario identified for Santa Cruz project was scenario 18.		
B.2. Project boundary					
B.2.1. Are all emission sources and gasses related to the baseline scenario, project scenario and leakage clearly identified and described in a complete manner?	1 2	DR	CAR 2: In the table of section B.3 it is lacking to inform "On-site fossil fuel and electricity consumption due the project activity (stationary or mobile). It was confirmed in the revised PDD the inclusion of the missing information. Only the emissions (CO_2) of the grid electricity generation in the baseline were considered into the project boundary. The other sources and gases mentioned by the methodology were discussed and justification related to their exclusion was provided in the PDD. CAR 2 was closed out.	CAR 2	Ok
B.2.2. In case of grid connected electricity projects: Is the relevant grid correctly identified in accordance with EB guidance and the	1 3	DR	It was considered the S_SE_CO Brazilian grid.	Ok	Ok

CHECKLIST QUESTION	Ref. ID	MoV*	COMMENTS	Draft Concl	Final Concl
underlying methodology?					
B.2.3. Are the project's spatial boundaries (geographical) and the project's system boundaries (components and facilities used to mitigate GHGs) clearly defined?	1 2 3	DR/ S	Yes. The spatial extend of the project encompass the bagasse stocking area, the means for transportation of biomass from stock to power plant, the bagasse power plant at the project site and all power plants connected physically to the electricity system (interconnected grid) that the CDM project power plant is connected to.	Ok	Ok
B.3. Identification of the Baseline Scenario					
B.3.1. Does the PDD discuss the identification of the most likely baseline scenario? Does the PDD 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?	1 4	DR	NIR 3 : The methodology requires the use of "Combined tool to identify the baseline scenario and demonstrate additionality".it was not applied in the PDD. It was justified by the project developer that methodologies using the combined tool are only applicable if all potential alternative scenarios to the proposed project activity are available options to project participants. For grid-connected power projects, such as Santa Cruz, an alternative would be the electricity production by other facilities. This alternative is not under the control of project participants. In those cases, according to the "*Combined tool to identify the baseline scenario and demonstrate additionality*" foot notes, participants could continue to use the "Tool for the demonstration and assessment	NIR 3	Ok

CHECKLIST QUESTION	Ref. ID	MoV*	COMMENTS	Draft Concl	Final Concl
			of additionality". NIR 3 was closed out.		
B.3.2. Does the application consider 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??	1 4	DR	The following credible scenarios were presented: - A new plant operating with low energy efficiency and not exporting electricity to the grid; - The project activity implemented without been registered as a CDM project; and - The country providing the same amount of energy using the current generation system, which is electricity supplied by large hydro and thermal power stations.	Ok	Ok
B.3.3. Is the choice of the baseline compatible with the available data?	1 4	DR	Yes	Ok	Ok
B.3.4. Is conservativeness addressed in the way of identifying the baseline?	1 4	DR	Yes, see also NIR 3	See also NIR 3	Ok
B.3.5. Does the selected baseline represent the most likely scenario among other possible and/or discussed scenarios?	1 4	DR	The selected baseline scenario is the implementation of fossil fuel thermal plants that would supplied the grid. The discussion provided support this conclusion.	To be confirmed	Ok
B.4. Additionality					
B.4.1. Does the PDD clearly demonstrate the additionality using the approach as given by	1	DR	NIR 4: In the PDD, it was used the "*Tool for demonstration and assessment of*	NIR 4	Ok

CHECKLIST QUESTION	Ref. ID	MoV*	COMMENTS	Draft Concl	Final Concl
the methodology and by following all the required steps?	2 4		*additionality*" version 3. The methodology requires the use of "Combined toll to identify the baseline scenario and demonstrate additionality". Close out details: See response to NIR 3 (it is also applicable to NIR 4). In the final version of PDD, it was applied the "Tool" version 5 (the current one).		
B.4.2. In case of using the additionality tool: Are all steps followed in a transparent manner?	1 4	DR	See NIR 04. Steps 1, 2 ,3 and 4 were used. For step 2, Option III (benchmark analysis) was applied. See NIR 16 Issues identified in the Step 3 discussion were addressed in NIR 5. Issues related to Step 4 were addressed in NIR 6.	See also NIR 4 NIR5 NIR 6 NIR 16	Ok
B.4.3. Is the discussion on additionality and the evidence provided consistent with the starting date of the project	1 4 10 44	DR	The PP proved that the starting date (28/09/2006 – ref. 10 – page 4) refers to investment approved by Santa Cruz relating to order of major equipment (boiler of 150t/h). It was evidenced that CDM was seriously considered when the company decided to implement the project, as demonstrated in the directors meeting notes (carried out on 24 August 2006, Ref. 44).	Ok	Ok
B.4.4. Is the discussion on additionality consistent with the identification all potential realistic and	1 4	DR	See NIR 3 and NIR 4	NIR 3 and	Ok

CHECKLIST QUESTION	Ref. ID	MoV*	COMMENTS	Draft Concl	Final Concl
credible baseline scenarios				NIR 4	
B.4.5. If an investment analysis has been used, has it been shown 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?	1 4 5 11 12a 12b 13 15	DR/I	NIR 16: It was not provided the worksheet and calculation to justify the step 2 and sensitive analyses. A summary of the worksheet and its data were not included in the PDD. The electronic spreadsheet used for the cash flow and for the sensitivity analysis was provided. Data which support the calculation of the WACC were also provided. The validation team discussed the assumptions and values with the project consultants. Figures related to costs, prices and rates, among others, were confirmed (review of references and checking of independent sources). The information provided was transparent and complete, and all assumptions applied were considered reasonable. From the benchmark analysis, it was demonstrated that the IRR (9.30%) of the project was lower than the company internal benchmark (11.13%). The sensitivity analysis considered increasing in the project revenue and reduction in running costs (5%). It was verified that the project IRR remained lower than the benchmark even in the case where these parameters change in favor of the project. NIR 16 was closed out.	NIR 16	Ok

CHECKLIST QUESTION	Ref. ID	MoV*	COMMENTS	Draft Concl	Final Concl
B.4.6. 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?	1 4 14	DR	NIR 5: The starting date of the project was informed as 01/01/2008. The discussion of barriers (institutional barriers) was justified in the PDD using the context of year 2004. It should be provided additional information to support how the 2004 context had impact on the project activity (is the barrier still in place?). The "Core business barrier" discussed in the PDD could not be justified "per si". Additional evidence should be provided that the sale of electricity represents 7.5 % of the total net revenues. The analysis related to the "Core business barrier" was provided and demonstrated that the sale of electricity will represent around 8.7% of the total net revenues of the mill. The value was corrected in the revised PDD. It was revised the starting date of the project (see also NIR 12) which was changed to 28/09/2006. Additional information was mentioned and discussed in the PDD to support that the 2004 context is still valid. Complete references were included in the PDD. Data related to operating plants (October 2007) demonstrated that the generation of electrical energy from sugarcane bagasse represents 2.69% of the total generation of electricity in Brazil. NIR 5 was closed out.	NIR 5	Ok
B.4.7. Has it been shown that the project is not common practice?	1	DR	NIR 6: The sources of this information "Currently in Brazil, there are more than 320	NIR 6	Ok

CHECKLIST QUESTION	Ref. ID	MoV*	COMMENTS	Draft Concl	Final Concl
	4		sugar mills producing sugar, ethanol and electricity to supply their own energy consumption, but less than 20% have developed expansion programs for their power plants"… was not provided in the PDD. It was not clear why Coopersucar was mentioned in this section (is the plant member of this cooperative?). The sources of data mentioned in the discussion of Step 4 were included in the PDD. The references mentioned in the PDD were verified and figures were confirmed. NIR 6 was closed out.		
B.4.8. Is it demonstrated/justified that the project activity itself is not a likely baseline scenario	1 4	DR	See: NIRs 3, 4, 5, 6,16. - It was confirmed that the project is not the most attractive investment if compared with the internal benchmark of the company. - the generation of electricity by sugar mills is not a common practice in the region where the project is installed. Considering both the investment analysis and barriers analysis, it was concluded that the project is additional (is not itself a baseline scenario).	See NIR 3,4,5,6, 16	Ok
B.5. Application of the baseline methodology					
B.5.1. Has the approved methodology been applied correctly for determining **baseline emissions**?	1 2 3	DR	Yes. For the baseline scenario 18, baseline emissions due to the natural decay or burning of anthropogenic sources of biomass residues were not applied.	Ok	Ok

CHECKLIST QUESTION	Ref. ID	MoV*	COMMENTS	Draft Concl	Final Concl
B.5.2. Has the approved methodology been applied correctly for determining **project emissions**?	1 2 3	DR	Project emissions will be = 0	Ok	Ok
B.5.3. Has the approved methodology been applied correctly for determining **leakage**?	1 2	DR	No leakage was considered for scenario 18. LE=0	Ok	Ok
B.5.4. Where applicable, has the approved methodology been applied correctly for the **direct calculation of emission reductions**	1 2 3 9 24 25	DR	CAR 7: The equation 1 presented in the PDD (page 21) was not informed exactly as equation 1 for Emission Reduction in ACM0006 version 6. The revised PDD was verified. The equation was corrected. CAR 7 was closed out. Regarding the ER calculations: As described in the PDD and required by ACM0006, $ER = EG_y x EF$ EF was calculated *ex-ante*, following the steps and formulas defined by ACM0002. The value obtained was 0. 0.2826 tCO2/MWh. (see NIR 8 related to EFgrid). Net quantity is the exported energy plus the energy consumed internally in the sugar mill minus the energy consumed in the auxiliary systems. EG = EG project plant * (1 – Effic.plant	CAR 7	Ok

CHECKLIST QUESTION	Ref. ID	MoV*	COMMENTS	Draft Concl	Final Concl
			baseline/Efficiency plant project). EGy is determined based on the average net efficiency of electricity generation in the reference plant that would be installed in the absence of the project activity and that would have a lower efficiency of electric generation than the project plant and the average net efficiency of electricity generation in the project plant after project implementation. The data and references for calculation of the average net efficiency of electricity generation in the reference plants were provided when CAR 13 was closed out. A list of new plants which export energy to the grid was obtained in Única's website. Their efficiency was obtained with data obtained directly with the three producers (Eldorado, Itapagipe and Limeira do Oeste plants). The average obtained was 0.034 MWh electricity / MWh biomass. The average net efficiency of electricity generation in the project plant was calculated by dividing the electricity generation during the year by the quantity of fuel (in the case of project, total of bagasse) expressed in energy units. The bagass NCV value used for calculation of the efficiency of reference plants was 2.0		

CHECKLIST QUESTION	Ref. ID	MoV*	COMMENTS	Draft Concl	Final Concl
			MWh/ton bagass (value provided by the reference plants) and 2.04 MWh/ton bagass (for project plant, value monitored by Santa Cruz). The quantity of biomass combusted in the project plant was estimated based on the total of sugar cane to be milled yearly. The amount of sugar cane processed yearly, presented in the PDD and in the cash flow spreadsheet, are consistent with historic data of Santa Cruz available on-site.		
B.5.5. Have all the methodological choices been explained, have they been properly justified and are they correct	1 2 3	DR	Yes. The scenario 18 was correctly applied. Emission reductions from heat were not considered in the calculations because the heat efficiency of the new plant is higher than the heat efficiency of the existing equipment and, for conservativeness reasons, they are excluded, as allowed by ACM0006.	Ok	Ok
B.5.6. Are uncertainties in the GHG emissions estimates properly addressed in the documentation?	1 6	DR	Yes, the capacity factor (85%) was considered in the calculation of the electricity to be generated. The uncertainties (as crop season problems or operational problems) are considered in the capacity factor defined.	To be confirmed	Ok
B.6. Ex-ante data and parameters used					
B.6.1. Are the data provided in compliance with the methodology?	1 2	DR	Yes, the ex-ante date comprises: - the $EF_{grid,(}$For its calculation, it is	See NIR 8	Ok

CHECKLIST QUESTION	Ref. ID	MoV*	COMMENTS	Draft Concl	Final Concl
	3 7 9		required t oobtain the $EF_{BMgrid,y}$ and $EF_{OMgrid,y)}$; See NIR 8 under B.6.3 below. - the average net energy efficiency of power or heat generation in the reference power plants.		
B.6.2. Is all the data derived from official data sources or replicable records and have these been correctly quoted?	1 2 3 7 9	DR	CAR 13: The information provided for data and parameters available at validation is incomplete. It is not informed the source of data used for *ex-ante* calculation of $EF_{grid,}$ $EFBM_{grid}$ $EFOM_{grid;}$ and the values $EFBM_{grid}$ $EFOM_{grid.}$ Also, it is not provided the source of data and value applied for the efficiency of the reference plant in the complete table Formulas and data used for EF calculation were verified and were included in the PDD (see also NIR 8). Sources of data for the efficiency of the reference plant were included in the table related to this parameter (PDD, section B.6.2) and were confirmed (Ref.9). Information about electricity efficiency calculation was provided in section B.6.3. CAR 13 was closed out.	CAR 13	Ok
B.6.3. Is the vintage of the baseline data correct?	1	DR	NIR 8: For the calculation of EF grid, ACM0002 (version 6) requires the most	NIR 8	Ok

CHECKLIST QUESTION	Ref. ID	MoV*	COMMENTS	Draft Concl	Final Concl
	2 3 7		recent 3 years for which data are available at the time of PDD submission. The data used were from 2003-2005. It should be clarify why data of 2006 year were not considered. Also, in the PDD Annex 3 (page 44) there were references to dispatch information from 2002 to 2004. So, it is not clear which period was applied. The EF grid was revised. The value obtained was 0.2826 tCO_2/MWh. Data used for calculation were updated, was verified in Ref. 7. A new version of PDD included the period 2004-2006. NIR 8 was closed out.		
B.7. Calculation of Emissions Reductions					
B.7.1. Has the approved methodology been applied correctly for determining **emission reductions**?	1 2 3 6	DR	Yes, as described in the PDD and required by ACM0006, ER = EG_yx EF See also comments under B.5.4 and comments about EF in the section B.6 above.	Ok	Ok
B.7.2. Are the emission reduction calculations documented in a complete and transparent manner?	1 2 6	DR	Yes, it was clearly documented in the PDD and a spreadsheet with data and formula was provided during the validation.	Ok	Ok
B.7.3. Have conservative assumptions been used to calculate emission reductions?	1 6	DR	Yes, it was used a capacity factor of 85% (lower than the historic of the plant). The numbers of days considered is also lower	To be confirmed	Ok

CHECKLIST QUESTION	Ref. ID	MoV*	COMMENTS	Draft Concl	Final Concl
			than the historic of the plant.		
B.7.4. Is the projection based on provable input parameter?	1 6	DR	Yes, based on the net electricity exported to the grid multiplied by the EF (calculated ex-ante).	To be confirmed	Ok
B.7.5. Is the projection based on same procedures as used for later monitoring or acceptable alternative models?	1 6	DR	Yes, projection is based on the equation defined by ACM0006 for scenario 18.	To be confirmed	Ok
B.7.6. Is the calculation of the emission reduction correct?	1 6	DR	Yes, it was confirmed checking the formulas applied in the electronic spreadsheet (ref. 6). ERy = ERheat.y + ERelectricity.y – PEy – Ly As ERheat =0, PE=0 and Ly=0, ERy = ERelectricity.y ER electricity = EGy * EFgrid The estimation of 401,596 t CO_2e was supported by the evidences verified during the validation.	To be confirmed	Ok
B.8. Emission Reductions					
B.8.1. Will the project result in fewer GHG emissions than the baseline scenario?	1 2 6	DR	Yes.	Ok	Ok
B.8.2. Is the form/table required for the indication of projected emission reductions correctly applied?	1	DR	The finding related to the first year was included in CAR 1 (see clause A.4.12)	See CAR 1	Ok

CHECKLIST QUESTION	Ref. ID	MoV*	COMMENTS	Draft Concl	Final Concl
B.8.3. Is the projection in line with the envisioned time schedule for the project's implementation and the indicated crediting period?	1	DR	See above and CAR 1	See CAR 1	Ok
B.9. Monitoring Methodology					
B.9.1. Does the monitoring methodology provide a consistent approach in the context of all parameter to be monitored and further information provided by the PDD?	1 2	DR	See CAR 14	See CAR 14	Ok
B.9.2. Does the monitoring methodology apply consistently the choice of the option selected for monitoring both of project and baseline emissions?	1 2	DR	See CAR 14	See CAR 14	Ok
B.10. Data and parameters monitored					
B.10.1. Does the monitoring plan provide 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?	1 2	DR	CAR 14: Tables in section B.7 are incomplete. It is not provided the description of measurement methods and procedures to be applied for EGproject plant$_{y.}$ It was not informed the QA/QC procedures to be applied for EG_y (Net quantity of increased electricity generation as a result of the project activity). The monitoring of NCVbiomass and of the efficiency did not comply with ACM0006 version 6 requirements. In addition, it was not included the monitoring of moisture content of the biomass Measurement procedures to be applied for EGproject plant were described in the revised PDD. It was justified that the	CAR 14	Ok

CHECKLIST QUESTION	Ref. ID	MoV*	COMMENTS	Draft Concl	Final Concl
			calculation of EGy does not need specific procedures. The monitoring of NCVbiomass and boiler efficiency was revised. The monitoring of moisture content of the biomass was included in the PDD; the monitoring of this parameter is done by Santa Cruz, as described in the Monitoring Plan. CAR 14 was closed out.		
B.10.2. Are the choices of project GHG indicators reasonable and in conformance with the requirements set by the approved methodology applied?	1 2	DR	See CAR 14	See CAR 14	Ok
B.10.3. Will it be possible to determine the specified project GHG indicators?	1 2	DR	See CAR 14	See CAR 14	Ok
B.10.4. Will the indicators enable comparison of project data and performance over time?	1 2	DR	See CAR 14	See CAR 14	Ok
B.10.5. 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?	1 2	DR	No. See CAR 14 related to the missing information in the tables of Section B.7. of the PDD.	CAR 14	Ok
B.10.6. Is the information given for each monitoring variable by the presented table sufficient to ensure the delivery of high quality data free of potential for biases or intended or unintended changes in data records?	1 2	DR	No. See CAR 14 related to the missing information in the tables of Section B.7. of the PDD.	CAR 14	Ok
B.10.7. Is the monitoring approach in line with current good practice, i.e. will it deliver data in a	1	DR	No. See CAR 14 related to the missing	CAR 14	Ok

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reliable and reasonably acceptable accuracy?	2		information in the tables of Section B.7. of the PDD.		
B.10.8. Are all formulae used to determine project emission clearly indicated and in compliance with the monitoring methodology.	1 2	DR	Yes. PE = 0	Ok	Ok
B.11. Quality Control (QC) and Quality Assurance (QA) Procedures					
B.11.1. Is the selection of data undergoing quality control and quality assurance procedures complete?	1 2	DR	See CAR 14	See CAR 14	Ok
B.11.2. Is the belonging determination of uncertainty levels done correctly for each ID in a correct and reliable manner?	1 2	DR	Yes	To be confirmed	Ok
B.11.3. Are quality control procedures and quality assurance procedures sufficiently described to ensure the delivery of high quality data?	1 2	DR	See CAR 14 details related to QC/QA for EG_y (Net quantity of increased electricity generation).	See CAR 14	Ok
B.11.4. Is it ensured that data will be bound to national or internal reference standards?	1	DR	Data and procedures were not site specific.	Ok	Ok
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?	1	DR	The plant quality management system is audited by external and independent organization. The quantity of electricity exported to the grid can be cross-checked with measurements done by the electricity company. It can also be verified by sales invoices. Santa Cruz revenues (due	To be verified	Ok

CHECKLIST QUESTION	Ref. ID	MoV*	COMMENTS	Draft Concl	Final Concl
			electricity sales) are verified by external entity (financial audit).		
B.12. Operational and management structure					
B.12.1. Is the authority and responsibility of project management clearly described?	1 38	DR/ S/I	See PDD page 34: “The project sponsor will proceed with the necessary measures for the power control and monitoring”. The organizational responsibilities were confirmed on-site.	To be verified	Ok
B.12.2. Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described?	1	DR/ S/I	See PDD page 34: Santa Cruz S.A. - Açúcar e Álcool is responsible for the project management, monitoring and reporting as well as for organising and training of the staff in the appropriate monitoring, measurement and reporting techniques. The person in charge for the project monitoring and reporting is Rudinei Sergio Pestana, Integrated Management Coordinator. This information was confirmed on-site by local assessors.	To be verified	Ok
B.12.3. Are procedures identified for training of monitoring personnel?	1	DR/ S/I	It was verified on-site that training is performed as part of the plant routine. There is no extensive training required due the project activity.	To be confirm ed	Ok
B.13. Monitoring Plan (Annex 4)					
B.13.1. Is the monitoring plan developed in a project specific manner clearly addressing the unique features of the CDM activity?	1 2	DR/ S/I	No monitoring plan was presented in Annex 4. All information regarding monitoring was presented on Sections B.7.1 and B.7.2 of	See clauses B.10	See clauses B.10 and

CHECKLIST QUESTION	Ref. ID	MoV*	COMMENTS	Draft Concl	Final Concl
			the PDD. See comments in this checklist under clauses B.10.1 to B.11.5	and B.11 of this checkli st	B.11 of this checklist
B.13.2. Does the monitoring plan completely describes all measures to be implemented for monitoring all parameter required, including measures to be implemented for ensuring data quality?	1 2	DR/ S/I	No monitoring plan was presented in Annex 4. All information regarding monitoring was presented on Sections B.7.1 and B.7.2 of the PDD. See comments in this checklist under clauses B.10.1 to B.11.5	See clauses B.10 and B.11 of this checkli st	See clauses B.10 and B.11 of this checklist
B.13.3. Does the monitoring plan provide information on monitoring equipment and respective positioning in order to safeguard a proper installation?	1 2	DR/ S/I	No monitoring plan was presented in Annex 4. All information regarding monitoring was presented on Sections B.7.1 and B.7.2 of the PDD. See comments in this checklist under clauses B.10.1 to B.11.5	See clauses B.10 and B.11 of this checkli st	See clauses B.10 and B.11 of this checklist
B.13.4. Are procedures identified for calibration of monitoring equipment?	1 2 31	DR/ S/I	No monitoring plan was presented in Annex 4. All information regarding monitoring was presented on Sections B.7.1 and B.7.2 of the PDD. Specifically for calibration, NIR 15 was raised: Information about calibration of meters to be used for measurement of the amount of biomass combusted in the project and for measurements of NVC and moisture	NIR 15	Ok Observati on (2): Although the NCV of bagass will be determine d by

CHECKLIST QUESTION	Ref. ID	MoV*	COMMENTS	Draft Concl	Final Concl
			content of bagasse were not provided in the description of monitoring plan. The PDD was revised and information was included in Section B.7.1 and B.7.2 (Description of Monitoring Plan and in the table related to each monitored parameters). The calibration of the electricity meters will be done according to the regulations of ANEEL. The quality management system implemented in Santa Cruz covers the calibration and maintenance of all meters and monitoring devices used in the plant. NIR 15 was closed out.		external laboratories, Santa Cruz should be responsible to assure that these laboratories are accredited to perform this kind of analysis and the calibration certificates of the devices used should be available if requested. The external laboratory should comply with ACM0006 that

CHECKLIST QUESTION	Ref. ID	MoV*	COMMENTS	Draft Concl	Final Concl
					requires monitoring at least every six months, considering at least 3 samples of each measurement.
B.13.5. Are procedures identified for maintenance of monitoring equipment and installations?	1 2 34	DR/ S/I	It is informed in the PDD and confirmed on-site: "General maintenance and maintenance of equipment and installations will be done yearly, according to the internal procedures of Santa Cruz S.A - Açúcar e Álcool and the manufacturers' recommendations.".	To be confirmed	Ok
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 documentation)	1	DR/ S/I	CAR 9: The description of the Monitoring Plan did not include complete information about records and archiving, as required for CDM projects. The information about archiving was included in the PDD, section B.7.1 (tables of parameters to be monitored). All the monitoring parameters will be archived for two years from the end of the crediting period. CAR 09 was closed out. The quality management system of the	CAR 09	Ok

CHECKLIST QUESTION	Ref. ID	MoV*	COMMENTS	Draft Concl	Final Concl
			plant cover the other issues related to the documentation control.		
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??	1	DR/ S/I	NIR 10: It was informed in the PDD that the measurement of the energy generated to the grid will be done by electronic redundant meters. Although the information above was provided, it was not clear in the description of the Monitoring Plan what should be done about data adjustment or missing data. The following information was included in the revised PDD: *"The measurement of the energy generated to the grid will be done by two three-fase four wire electronic redundant meters, model ELO.2180. They will be installed in metallic panels inside Companhia Bioenergética Santa Cruz 1 and 2 control room. Since the system is redundant, if there is any problem with the meter which is used to collect data for energy sales invoice, measurements will be taken from the second meter. If both have problems, Santa Cruz will have additional ELO.2180 meters, one for each generator, which will be used for internal control".* NIR 10 was closed out.	NIR 10	Ok
B.13.8. Are procedures identified for internal audits of GHG project compliance with operational requirements where applicable?	1 35 36	DR/ S/I	CAR 11: The description of the Monitoring Plan did not include procedures for internal audits or for review of data before submission internally or externally. It was informed in the revised PDD that	CAR 11	Observation (1)

CHECKLIST QUESTION	Ref. ID	MoV*	COMMENTS	Draft Concl	Final Concl
			"*Since Santa Cruz S.A – Açúcar e Álcool is certified for both ISO 9001 (including the production of electrical energy) and ISO 14001, all procedures for internal audits will be done according to those standards*". CAR 11 was closed out and Observation (1) was raised: the procedures for internal audits should be updated to include all aspects related to the CDM project, besides the operational issues of the cogeneration plant. Revised procedures should be available before the first crediting period.		
B.13.9. Are procedures identified for project performance reviews before data is submitted for verification, internally or externally?	1	DR/ S/I	See CAR 11	CAR 11	Observation (1)
B.14. Baseline details					
B.14.1. Is there any indication of a date when determine the baseline?	1	DR	It was informed in the PDD as 30/07/2007.	Ok	Ok
B.14.2. Is this in consistency with the time line of the PDD history?	1	DR	Yes.	Ok	OK
B.14.3. Is all data required provided in a complete manner by annex 3 of the PDD?	1	DR	Yes, data related to electricity generation of Santa Cruz and data used for calculation of EF grid.	Ok	Ok
C. **Duration of the Project / Crediting Period**					
C.1.1. Are the project's starting date and operational lifetime clearly defined and reasonable?	1 10	DR	Starting date informed: 01/01/2008. NIR 12: It is not clearly justified why the starting date was defined as such, once the project was planned and submitted to the	NIR 12	Ok

CHECKLIST QUESTION	Ref. ID	MoV*	COMMENTS	Draft Concl	Final Concl
			governmental agencies (CETESB and ANEEL) before this date. The PDD was revised and the date informed (01/01/2008) was changed to 24/08/2006. It was evidenced that on that date the directors of Santa Cruz approved the investments on the cogeneration plant, considering the opportunity of the CDM (Ref. 10). The date corrected date was mentioned in the revised PDD, section C.1.1. NIR 12 was closed out. Lifetime was confirmed on-site by document review: 25 years.		
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)?	1	DR	Yes, renewable crediting period of max 7 years. Starting date: 01/09/2008	Ok	Ok
C.1.3. Does the project's operational lifetime exceed the crediting period	1	DR	Yes. 25 years	Ok	Ok
D. Environmental Impacts					
D.1.1. Does the project comply with environmental legislation in the host country?	16 17	DR	Santa Cruz plant is already covered by the Operating License nº 28002148 (24/03/2008). The following licenses were provided during the desk study, related specifically to the cogeneration plant expansion capacity: - Preliminary Environmental License – LP 01108 (issued by SMA/SP on 26/04/2007);	Ok	Observation 3: The environmental licenses related to the project implement

CHECKLIST QUESTION	Ref. ID	MoV*	COMMENTS	Draft Concl	Final Concl
			- Request for the Installation License (sent to CETESB – environmental agency, on 06/09/2007).		ation and operation should be available before the first verification assessme nt
D.1.2. Has an analysis of the environmental impacts of the project activity been sufficiently described?	18	DR/ S	There is an environmental assessment report covering the impacts from the boilers operation (Ref.18).	To be confirm ed	Ok
D.1.3. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	16, 17	DR	Santa Cruz plant is already covered by the Operating License nº 28002148 (24/03/2008) issued by CETESB. The environmental agency approved all EIA requirements before issuing the licenses. There is a Preliminary License (LP 01108 issued by SMA/SP, Ref. 16. Santa Cruz requested the installation license to cover the next phase of the project implementation (request sent to CETESB on 06/09/2007, Ref.17).	To be confirm ed	Ok
D.1.4. Will the project create any adverse environmental effects?	18	DR	The environmental assessment report was provided (Ref.18). Mitigation measures and a monitoring plan were proposed for the impacts identified (mainly related to emissions from the boilers).	To be confirm ed	Ok
D.1.5. Are transboundary environmental impacts considered in the analysis?	18	DR/ S	See above.	To be confirm	Ok

CHECKLIST QUESTION	Ref. ID	MoV*	COMMENTS	Draft Concl	Final Concl
				ed	
D.1.6. Have identified environmental impacts been addressed in the project design?	18	DR/ S	Mitigation measures and a monitoring plan were proposed for the impacts identified (mainly related to emissions from the boilers).	To be confirm ed	Ok
E. Stakeholder Comments					
E.1.1. Have relevant stakeholders been consulted?	1 39 40	DR	The PDD provided a list of stakeholders contacted. Records of mailing were provided (Ref.40)	Ok	Ok
E.1.2. Have appropriate media been used to invite comments by local stakeholders?	39 40	DR	Verified on-site copies of the letters sent to local stakeholders (Ref.39)	To be confirm ed	Ok
E.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	39	DR	Yes, the list of local organizations contacted complied with the DNA requirements. Confirm the names of stakeholders by mailing receipts (Ref.40)	Ok	Ok
E.1.4. Is the undertaken stakeholder process described in a complete and transparent manner?	40	DR	Verified on-site copies of the leters sent to local stakeholders (Ref.39)	To be confirm ed	Ok
E.1.5. Is a summary of the stakeholder comments received provided?	41	DR	No concerns were raised. Supportive comment received from the city hall of Americo Brasiliense (ref.41)	To be confirm ed	Ok
E.1.6. Has due account been taken of any stakeholder comments received?	41	DR/I	To be confirmed on-site. Only a supportive comment received, no need of clarification or response.	To be confirm ed	Ok

Table 3 Additional requirements for AR projects: not applicable

3.1 Does the PDD specifically consider impacts on biodiversity and natural ecosystems, in addition to socio-economic and environmental impacts?					
3.2 Are management activities, including harvesting cycles and verification programmes chosen to avoid a systemic verification of peaks in carbon stocks?					
3.3 Have the project participants indicated whether they choose to account using lCERs or tCERs as defined in Section K, paras 38 – 60 of Decision 19/CP.9					
3.4 Has the project undergone international public consultation for a period to 45 days?					
3.5 Have selected carbon pools been be ignored in accordance with the conditions described in Para 21 of Decision 19/CP.9 and does the project avoid double counting?					
3.6 Has a project lifetime of 20 years renewable three times or 30 years been selected?					
3.7 Does the monitoring plan take account of issues related to biodiversity and natural ecosystems identified elsewhere in the PDD?					
3.8 Is the application of lCERs and tCERs accounting regimes consistent with Sections J and K and Decision 19/CP.9?					
3.9 Note Appendix B highlighting the differences in the PDD, the PDD template for AR projects and the guidelines, available at http://cdm.unfccc.int/Reference/Documents					

References

Reference ID	Title / description	Comments
/1/	Project Design – Santa Cruz S.A – Açúcar e Álcool – Cogeneration Project, version 1 - 29/08/2007, version 2 - 19/10/2007, version 3 – 29/10/2007, version 4 – 22/11/2007, version 5 – 23/11/2007 and version 6 – 30/01/2008, version 7 19/03/2008, version 8 – 02/07/2008, version 9 – 10/07/2008.	
/2/	Consolidated baseline and monitoring methodology for grid-connected electricity generation from biomass residues – ACM0006, version 06.	
/3/	Consolidated baseline and monitoring methodology for grid-connected electricity generation from renewable sources – ACM0002, version 6.	
/4/	Tool for the demonstration and assessment of additionality, version 5.	
/5/	Cash flow spreasheet	Investment analysis and sensitivity analysis
/6/	Santa Cruz_calculation CERs_2007.11.24	Emission reduction estimative
/7/	BR-Grid EF SSECO-2004 to 2006-2007.07.30 b	Calculation of EF grid
/8/	Auxiliary system spreadsheet	Consumption by auxiliary system of the plant
/9/	Reference Plants_Efficiency	
/10/	Starting Date (investments approved by Santa Cruz)	page 3 – Ordering of major equipment (Boiler 150 t/h – 65kg/cm2)
/11/	PPA (Power Purchase Agreement)	Prices of energy used in the cash flow
/12a/	TUSD_TUST	Costs of kW used in the cash flow
/12b/	Beta Cosan (one of the data used for calculation of WAAC – investment analysis)	
/13/	Investments approved by Santa Cruz	
/14/	Revenues from the sale of electricity	

/15/	Energy in the Free Market	Prices of energy used for revenues estimation
/16/	Previous Environmental License	
/17/	Request for Installation license	
/18/	Environmental report	
/19/	Specification of Turbo-generator	
/20/	Turbo-generator - efficiency	
/21/	Specification Boiler 150 tvh - 65 kgf - 480	
/22/	Chronogram of the implementation UTE Santa Cruz	
/23/	Efficiency of boilers	
/24/	Sugarcane, sugar and alcohol production	
/25/	Sugarcane available_2007	
/26/	Electricity meter specifications	
/27a/	DAEE (coordinate reference)	
/27b/	Coordinates	
/28/	Heat efficiency of the boiler	
/29/	Enthalpy of the bolier	
/30/	Iplan - use of biomass in the boiler	
/31/	Calibration Cetec	Certificate of calibration of the scale used of for moisture content analysis.
/32/	Agreement EcoC_Santa Cruz	Evidences of the parts of the project.
/33a/	ANEEL license 330	
/33b/	ANEEL license 331	
/33c/	ANEEL license 3.288	

/34/	Work instructions	Plant operation procedure
/35/	ISO 9001 _Santa Cruz_2005_600	Quality management system certificate
/36/	ISO 14001_Santa Cruz_2005_600	Environmental management system certificate
/37/	Crop season report	
/38/	Organization Chart of Santa Cruz	
/39/	Letter to Local stakeholders	
/40/	Santa Cruz_ARs (mailing receipts)	
/41/	Response from a local stakeholder	
/42/	Capacity factor 85%	
/43/	Operation license, N° 28002148, issued on 24/03/2008	
/44/	CDM Consideration	Director meeting carried out on 24/08/2006

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Annex 3 - FINDINGS OVERVIEW

Findings from validation of Santa Cruz S.A. - Açúcar e Álcool - Cogeneration Project – VAL1264

Each Table below represents a finding from the validation assessment. The findings are numbered consecutively, approximately in the order that they have been identified.

Description of table:

Type	Findings are either New Information Requests (NIR) or Corrective Action Requests (CAR). CARs are items that must be addressed before a project can receive a recommendation for registration. NIRs may lead to the raising of CARs. Observations are included at the end and may or may not be addressed. They are primarily to act as signposts for the verifying DOE.
Issue	Details the content of the finding
Ref	refers to the item number in the Validation Protocol
Response	Please insert response to finding, starting with the date of entry.

Rows for comments and further response will be appended to the table until the Findings has been addressed to the satisfaction of the Lead Assessor.

Please note that this is an open list and more findings may be added as validation progresses.

Date: 01/10/2007 Raised by: Aurea Nardelli

No.	Type	Issue	Ref
1	CAR	The table required for the indication of projected emission reductions was not correctly applied. It indicated the starting period in 2007, which does not comply with the project starting date and starting date of the crediting period informed in Section C of the PDD.	A.4.12
Date: 25/10/2007 [Comments]: The table was corrected. The starting date of the first crediting period is 01/04/2008. Please refer to the revised version of the PDD.			
Date: 01/11/2007 – Aurea Nardelli [Acceptance and close out]: Table 1 in the revised PDD is now complying with the starting date of the crediting period (01/04/2008). CAR 1 was closed out.			

Date: 01/10/2007 Raised by: Aurea Nardelli

No.	Type	Issue	Ref
2	CAR	The emission sources and gasses related to the project activity were not identified and described in a complete manner (as required by ACM0006, version 6, page 21). In the table of section B.3 it is lacking to inform: "On-site fossil fuel and electricity consumption due the project activity (stationary or mobile).	B.2.1
Date: 25/10/2007 [Comments]: The information about on-site fossil fuel and electricity consumption due to the			

project activity was included in the table if section B.3. Please refer to the second version of the PDD.
Date: 01/11/2007 – Aurea Nardelli [Acceptance and close out]: It was confirmed in the revised PDD. Only the emissions (CO_2) of the grid electricity generation in the baseline were considered into the project boundary. The other sources and gases mentioned by the methodology were discussed and justification related to their exclusion was provided in the PDD. CAR 2 was closed out.

Date: 01/10/2007 Raised by: Aurea Nardelli

No.	Type	Issue	Ref
3	NIR	During the desk study it was not possible to confirm if the PDD discussed the identification of the most likely baseline scenario. The PDD did not follow the steps to determine the baseline scenario required by the methodology. The methodology requires the use of "*Combined tool to identify the baseline scenario and demonstrate additionality*".	B.3.1
Date: 25/10/2007 [Comments]: The alternatives to the project activity are: - A new plant operating with low energy efficiency and not exporting electricity to the grid; - The project activity implemented without been registered as a CDM project; and - The country providing the same amount of energy using the current generation system, which is electricity supplied by large hydro and thermal power stations. Methodologies using the combined tool are only applicable if all potential alternative scenarios to the proposed project activity are available options to project participants. For grid-connected power projects, such as this, an alternative is the electricity production by other facilities. This alternative is not under the control of project participants. In those cases, according to the "*Combined tool to identify the baseline scenario and demonstrate additionality*", a different procedure is required to demonstrate additionality and identify the baseline scenario: methodologies that involve alternatives which are not under the control of project participants can continue to use the additionality tool. This was done in this Project. Hence, the "Tool for the demonstration and assessment of additionality", current version will continue to be used.			
Date: 01/11/2007 – Aurea Nardelli [Acceptance and close out]: The clarification provided by the client was acceptable. It was confirmed on the "Combined tool" foot notes that methodologies which involves alternatives that are not under the control of project participants can continue to use the current "Additionality tool". NIR 3 was closed out.			

Date: 01/10/2007 Raised by: Aurea Nardelli

No.	Type	Issue	Ref
4	NIR	During the desk study it was not possible to confirm if the project is additional. Project participants should demonstrate additionality using the "Combined toll to identify the baseline scenario and demonstrate additionality". In the PDD, it was used the "*Tool for demonstration and assessment of additionality*" version 3	B.4.1
Date: 25/10/2007 [Comments]: Please refer to the NIR 3 answer.			
Date: 01/11/2007 – Aurea Nardelli [Acceptance and close out]: The clarification provided by the client was acceptable. It was			

confirmed on the “Combined tool” foot notes that methodologies which involves alternatives that are not under the control of project participants can continue to use the “Additionality tool”. NIR 4 was closed out.

Date: 01/10/2007 Raised by:Aurea Nardelli

No.	Type	Issue	Ref
5	NIR	It was not demonstrated that the 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. The starting date of the project was informed as 01/01/2008. The discussion of barriers (institutional barriers) was justified in the PDD using the context of year 2004. It should be provided additional information to support that the 2004 context had impact on the project activity. The “Core business barrier” discussed in the PDD could not be justified “per si”. Additional evidence should be provided that the sale of electricity represents 7.5 % of the total net revenues.	B.4.6
Date: 25/10/2007 [Comments]: A new starting date of the project, 28/09/2006, with annexed evidence, was informed in section C. .Additional information was provided in the PDD, in pages 19 and 20, to support that the 2004 context is still valid and has impact on the project activity. It was also shown that the implementation of fossil fuel thermal plants, the most likely alternative to this project, is not affected by the barriers mentioned in the PDD.			
Date: 01/11/2007 – Aurea Nardelli [Acceptance and close out]: The analysis related to the “Core business barrier” was provided (Ref.14). It demonstrated that the sale of electricity will represent around 8.7% of the total net revenues of the mill. The value was corrected in the revised PDD. It was also revised the starting date of the project (see also NIR 12) which was changed to 28/09/2006. Additional information was mentioned and discussed in the PDD to support that the 2004 context is still valid. Complete references were included in the PDD. Data related to operating plants (October 2007) demonstrated that the generation of electrical energy from sugarcane bagasse represents 2.69% of the total generation of electricity in Brazil. NIR 5 was closed out.			

Date: 01/10/2007 Raised by: Aurea Nardelli

No.	Type	Issue	Ref
6	NIR	It was not clearly demonstrated that the project is not common practice. The sources of this information “Currently in Brazil, there are more than 320 sugar mills producing sugar, ethanol and electricity to supply their own energy consumption, but less than 20% have developed expansion programs for their power plants”… was not provided in the PDD. It was not clear why Coopersucar was mentioned in this section (is the plant member of this cooperative?).	B.4.7
Date: 25/10/2007 [Comments]: The source of this information was included in the PDD. Santa Cruz is not a member of Coopersucar, but this cooperative was mentioned because it is the most important sugar cooperative in Brazil and, therefore, an important parameter to substantiate the common practice analysis.			
Date: 01/11/2007 – Aurea Nardelli			

[Acceptance and close out]: The sources of data mentioned in the discussion of Step 4 were included in the PDD. The references mentioned in the PDD were verified and figures were confirmed. NIR 6 was closed out.

Date: 01/10/2007 Raised by: Aurea Nardelli

No.	Type	Issue	Ref
7	CAR	The equation 1 presented in the PDD (page 21) was not informed exactly as equation 1 for calculation of Emission Reductions of ACM0006 version 6.	B.5.4
Date: 25/10/2007 [Comments]: The equation 1 was corrected. Please refer to the second version of the PDD.			
Date: 01/11/2007 – Aurea Nardelli [Acceptance and close out]: The revised PDD was verified. The equation was corrected. CAR 7 was closed out.			

Date: 01/10/2007 Raised by: Aurea Nardelli

No.	Type	Issue	Ref
8	NIR	It is not clear if the vintage of the baseline data is correct. ACM0002 (version 6) requires the most recent 3 years for which data are available at the time of PDD submission. The data used were from 2003-2005. Also, in the PDD Annex 3 (page 44) there were references to dispatch information from 2002 to 2004. It is not clear which period was applied and it should be justified (with evidences) why data of 2006 were not considered.	B.6.3
Date: 25/10/2007 [Comments]: All the information regarding the emission factor calculation was updated. Please refer to the second version of the PDD for the changes.			
Date: 01/11/2007 – Aurea Nardelli and Geisa Principe [Acceptance and close out]: The EF grid was revised. The value obtained was 0.2826 tCO_2/MWh. Data used for calculation were updated, was verified in Ref. 7. A new version of PDD included the period 2004-2006. NIR 8 was closed out.			

Date: 01/10/2007 Raised by: Aurea Nardelli

No.	Type	Issue	Ref
9	CAR	The description of the Monitoring Plan did not include complete information about records and archiving, as required for CDM projects.	B.13.6
Date: 25/10/2007 [Comments]: All the monitoring parameters will be archived for two years from the end of the crediting period. This information was included in the second version of the PDD.			
Date: 01/11/2007 – Aurea Nardelli [Acceptance and close out]: The information about archiving was included in the PDD, section B.7.1 (tables of parameters to be monitored). CAR 09 was closed out.			

Date: 01/10/2007 Raised by: Aurea Nardelli

No.	Type	Issue	Ref
10	NIR	It was informed in the PDD that the measurement of the energy	B.13.7

		generated to the grid will be done by electronic redundant meters. Although the information above was provided, it was not clear in the description of the Monitoring Plan what should be done about data adjustment or missing data.	
Date: 25/10/2007 [Comments]: This information was included in the second version of the PDD, in section B.7.2.			
Date: 01/11/2007 – Aurea Nardelli and Geisa Principe [Acceptance and close out]: The following information was included in the revised PDD: *"The measurement of the energy generated to the grid will be done by two three-fase four wire electronic redundant meters, model ELO.2180. They will be installed in metallic panels inside Companhia Bioenergética Santa Cruz 1 and 2 control room. Since the system is redundant, if there is any problem with the meter which is used to collect data for energy sales invoice, measurements will be taken from the second meter. If both have problems, Santa Cruz will have additional ELO.2180 meters, one for each generator, which will be used for internal control".* NIR 10 was closed out.			

Date: 01/10/2007 Raised by: Aurea Nardelli

No.	Type	Issue	Ref
11	CAR	The description of the Monitoring Plan did not include procedures for internal audits or for review of data before submission internally or externally.	B.13.8/B.13.9
Date: 25/10/2007 [Comments]: This information was included in the second version of the PDD, in section B.7.2.			
Date: 01/11/2007 – Aurea Nardelli [Acceptance and close out]: It was informed in the revised PDD that "*Since Santa Cruz S.A – Açúcar e Álcool is certified for both ISO 9001 (including the production of electrical energy) and ISO 14001, all procedures for internal audits will be done according to those standards*". CAR 11 was closed out and Observation (1) was raised: the procedures for internal audits should be updated to include all aspects related to the CDM project, besides the operational issues of the cogeneration plant. Revised procedures should be available before the first crediting period.			

Date: 01/10/2007 Raised by: Aurea Nardelli

No.	Type	Issue	Ref
12	NIR	It is not clearly justified why the starting date was defined as 01/01/2008. The project was planned and submitted to the governmental agencies (CETESB and ANEEL) before this date.	
Date: 25/10/2007 [Comments]: The project starting date was corrected to the date in which the directors allowed the project implementation. This date was amended in the second version of the PDD.			
Date: 01/11/2007 - Aurea Nardelli [Acceptance and close out]: Copy of the notes of Directors meeting carried out on 24/08/2006 was provided. It was evidenced that on that date the directors of Santa Cruz approved the investments on the cogeneration plant, considering the opportunity of the CDM. The date 24/08/2006 was mentioned in the revised PDD, section C.1.1. NIR 12 was closed out.			

Date: 06/10/2007 Raised by: Aurea Nardelli

No.	Type	Issue	Ref
13	CAR	The information provided for data and parameters available at validation is incomplete. It is not informed the source of data used for *ex-ante* calculation of $EF_{grid,}$ $EFBM_{grid}$ $EFOM_{grid;}$ and the values $EFBM_{grid}$ $EFOM_{grid.}$ Also, it is not provided the source of data and value applied for the efficiency of the reference plant in the complete table.	B.6.2
Date: 25/10/2007 [Comments]: The mentioned information and the appropriate values were included in the second version of the PDD. Moreover the source of data for the efficiency of the reference plant was included in the table. Also information about how this data was calculated is provided in section B.6.3.			
Date: 01/11/2007 – Aurea Nardelli and Geisa Príncipe [Acceptance and close out]: Formulas and data used for EF calculation were verified and were included in the PDD (see also NIR 8). Sources of data for the efficiency of the reference plant were included in the table related to this parameter (PDD, section B.6.2) and were confirmed (Ref.9). Information about electricity efficiency calculation was provided in section B.6.3. CAR 13 was closed out.			

Date: 06/10/2007 Raised by: Aurea Nardelli

No.	Type	Issue	Ref
14	CAR	The information provided for data and parameters monitored is incomplete (tables of section B.7.1). It is not provided the description of measurement methods and procedures to be applied for EGproject $plant_{y.}$ It was not informed the QA/QC procedures to be applied for EG_y (Net quantity of increased electricity generation as a result of the project activity). The monitoring of NCVbiomass and of the efficiency did not comply with ACM0006 version 6 requirements. In addition, it was not included the monitoring of moisture content of the biomass.	B.10.1
Date: 01/11/2007 [Comments]: Measurement procedures to be applied for EGproject plant are now described in the PDD. EGy is a calculated value, depending from:1- EGproject plant, 2 - the reference plant electrical efficiency and 3 - the project plant electrical efficiency. These measured values already have their own QA/QC procedures, so that the calculation of EGy does not need specific procedures. The monitoring of NCVbiomass and boiler efficiency is now complying with ACM0006 version 6 requirements. The monitoring of moisture content of the biomass.is now included in the PDD, in section B.7.2.			
Date: 05/11/2007 – Aurea Nardelli and Geisa Príncipe [Acceptance and close out]: The PDD was revised. Measurement procedures to be applied for EGproject plant were described. It was justified that the calculation of EGy does not need specific procedures. The monitoring of NCVbiomass and boiler efficiency was revised. The monitoring of moisture content of the biomass was included in the PDD; the monitoring of this parameter is done by Santa Cruz, as described in the Monitoring Plan, using calibrated equipment (copy of the scale certificate was provided, Ref. 31). CAR 14 was closed out.			

Date: 06/10/2007 Raised by: Aurea Nardelli

No.	Type	Issue	Ref
15	NIR	Information about calibration of meters to be used for measurement of the amount of biomass combusted in the project and for measurements of NVC and moisture content of bagasse were not provided in the description of monitoring plan.	B.13.4
Date: 01/11/2007			

[Comments]: Further information on calibration was included in the PDD, section B.7.2.
Date: 05/11/2007 – Aurea Nardelli and Geisa Príncipe [Acceptance and close out]: The PDD was revised. Additional information was included under the Description of Monitoring Plan and in the table related to each monitored parameters. It was informed that the calibration of the electricity meters will be done according to the regulations of ANEEL. The quality management system implemented in Santa Cruz covers the calibration and maintenance of all meters and monitoring devices used in the plant. NIR 15 was closed out and Observation (2) was raised: Although the NCV of bagass will be determined by external laboratories, Santa Cruz should be responsible to assure that these laboratories are accredited to perform this kind of analysis and the calibration certificates of the devices used should be available if requested. The external laboratory should comply with ACM0006 that requires monitoring at least every six months, considering at least 3 samples of each measurement.

Date: 06/10/2007 Raised by: Aurea Nardelli

No.	Type	Issue	Ref
16	NIR	It was not provided the worksheet and calculation to justify the step 2 and sensitive analyses. A summary of the worksheet and its data were not included in the PDD.	B.4.5
Date: 23/11/2007 [Comments]: All the relevant information for the calculation of the parameters mentioned in step 2 is provided in the PDD. The spreadsheet containing the calculation to justify the step 2 was sent to the DOE on October 15th, 2007.			
Date: 26/11/2007 - Aurea Nardelli and Geisa Príncipe [Acceptance and close out]: the electronic spreadsheet used for the cash flow and for the sensitivity analysis was provided to the DOE (Ref.5). Data which support the calculation of the WACC were also provided. The validation team discussed the assumptions and values with the project consultants, in order to verify the data. Figures related to costs, prices and rates, among others, were confirmed (review of references and checking of independent sources, see Ref. 11, 12a, 12b, 13 and 15). The information provided was transparent and complete, and all assumptions applied were considered reasonable. NIR 16 was closed out.			

Observations:

Observation (1) : the procedures for internal audits should be updated to include all aspects related to the CDM project, besides the operational issues of the cogeneration plant. Revised procedures should be available before the first crediting period.

Observation (2): Although the NCV of bagass will be determined by external laboratories, Santa Cruz should be responsible to assure that these laboratories are accredited to perform this kind of analysis and the calibration certificates of the devices used should be available if requested. The external laboratory should comply with ACM0006 that requires monitoring at least every six months, considering at least 3 samples of each measurement.

Observation 3: The environmental licenses related to the project implementation and operation should be available before the first verification assessment.

Statement of Competence

Name:Aurea Nardelli SGS Affiliate:Brazil

Status

- Product Co-ordinator ☐
- Operations Co-ordinator ☐
- Technical Reviewer ☐
- Expert ☒

	Validation	Verification
- Local Assessor	☒	☒
- Lead Assessor	☒	☒
- Assessor / Trainee Lead Assessor	☒	☒

Scopes of Expertise

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

Approved Member of Staff by Marco van der Linden Date: 16-03-2007

Statement of Competence

Name:Geisa Principe SGS Affiliate:SGS Brazil

Status

- Product Co-ordinator ☐
- Operations Co-ordinator ☐
- Technical Reviewer ☐
- Expert ☐

	Validation	Verification
- Local Assessor	☒	☒
- Lead Assessor	☐	☐
- Assessor / Trainee Lead Assessor	☒	☒

Scopes of Expertise

1. Energy Industries (renewable / non-renewable) ☒
2. Energy Distribution ☐
3. Energy Demand ☐
4. Manufacturing ☐
16. Chemical Industry ☐
17. Construction ☐
18. Transport ☐
19. Mining/Mineral Production ☐
20. Metal Production ☐
21. Fugitive Emissions from Fuels (solid,oil and gas) ☐
22. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride ☐
23. Solvent Use ☐
24. Waste Handling and Disposal ☐
25. Afforestation and Reforestation ☐
26. Agriculture ☐

Approved Member of Staff by Marco van der Linden Date: 13/03/2007

Statement of Competence

Name:Mayra Caradec SGS Affiliate:Latin America

Status

- Product Co-ordinator ☐
- Operations Co-ordinator ☐
- Technical Reviewer ☐
- Expert ☐

	Validation	Verification
- Local Assessor	☒	☒
- Lead Assessor	☐	☐
- Assessor / Trainee Lead Assessor	☒	☒

Scopes of Expertise

1. Energy Industries (renewable / non-renewable) ☐
2. Energy Distribution ☐
3. Energy Demand ☐
4. Manufacturing ☐
27. Chemical Industry ☐
28. Construction ☐
29. Transport ☐
30. Mining/Mineral Production ☐
31. Metal Production ☐
32. Fugitive Emissions from Fuels (solid,oil and gas) ☐
33. Fugitive Emissions from Production and ☐

Consumption of Halocarbons and Sulphur Hexafluoride

34. Solvent Use ☐
35. Waste Handling and Disposal ☐
36. Afforestation and Reforestation ☐
37. Agriculture ☐

Approved Member of Staff by Siddharth Yadav Date: 18/11/2007