São Paulo, 12 February 2009

Request for Review for "Santa Cruz S.A. – Açúcar e Álcool - Cogeneration Project" (2211)

Notification (e-mail message) received on 12 February 2009

Although the request is addressed to the DOE, Project Participants believe that the below provided information is helpful to address the raised issue. Requests 1, 2 and 3 ask for the same information. PPs comments to the raised issues are presented below.

1. *The DOE should clarify the rationale behind the decision to deviate from the methodology requesting the use of the "Combined tool to identify the baseline scenario and demonstrate additionality".*

During validation period, there was no clear information regarding the use of the "Combined Tool" with ACM0006. 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 note 2, in page 1, participants could continue to use the "Tool for the demonstration and assessment of additionality". That was the approach followed during validation. It is interesting to note that projects using ACM0006, version 5 - which is the first version to ask the use of the "Combined Tool" - were validated and registered at that time, without using the "Combined Tool", and they were taken by the project participants as a reference.

On August 28th, 2008, after the project Santa Cruz was already validated by the DOE, the request for clarification AM_CLA_0120 was submitted to the CDM Executive Board, regarding the application of the "Combined Tool". The second paragraph of this tool mentions that "*Methodologies using this tool are only applicable if all potential alternative scenarios to the proposed project activity are available options to project participants*". Nevertheless, the footnote referred to the above mentioned says that: "*In cases where one or more alternatives are not available options to project participants, a different procedure than provided here would be required to demonstrate additionality and identify the baseline scenario.(...) The Meth Panel is considering whether expanding this tool to cover all cases would be appropriate. In the meantime, methodologies that typically involve alternatives are not under the control of project participants can continue to use, if desired, the additionality tool. (...)*".

The DOE that submitted this request asked whether a biomass based co-generation project supplying power to grid, with one alternative which is not under the control of the project participants (P4, generation of power in the grid), which is the case of project 2211, could apply the latest version of the "Tool for the demonstration and assessment of additionality".

It was clarified by the Executive Board that project participants had, in that case two options:

i. Wait until a revision of the methodology is ready;

ii. Request the registration of the project using ACM0006 in its current version supported by a request for deviation. The purpose of the request for deviation is:

a. To allow that the baseline for incremental electricity, as defined in ACM0006, produced as a consequence of the project activity and exported to the grid is defined by default as being the grid; and

b. To allow the use of the additionality tool to assess the additionality of the project activity.

However, the Santa Cruz project was submitted for registration on August 13th, 2008, before this inconsistency between the methodology and the mentioned tools was noticed by the project participants.

Acknowledging the incompleteness of the project regarding the use of the "Combined Tool", due to the reasons mentioned above, project participants may revise the PDD, including the use of the "Combined Tool" to identify the baseline scenario, and of the "Tool for the demonstration and assessment of additionality", to assess the additionality of the project activity. The revised sections of this PDD are attached to this document (Annex A) and, as established by the Board in the answer of the request for clarification, the correspondent request for deviation (Annex B).

2. *The DOE is requested to further clarify how it has confirmed the suitability of the benchmark.*

In its paragraph 15, concerning "Investment comparison analysis and benchmark analysis", the "Guidance of investment analysis" states that: "If the alternative to the project activity is the supply of electricity from a grid, this is not to be considered an investment and a benchmark approach is considered appropriate". It adds: "The benchmark approach is therefore suited to circumstances where the baseline does not require investment or is outside the direct control of the project developer".

Paragraph 11 of the guidance also mentions that in cases where a benchmark approach is used, the applied benchmark shall be appropriate to the type of IRR calculated. Local commercial lending rates or weighted average costs of capital (WACC) are appropriate benchmarks for a project IRR.

The alternative to the Santa Cruz project activity is the supply of electricity from a grid. Hence, a benchmark approach was used, calculating the WACC, which is in accordance with the "Guidance of investment analysis".

WACC approaches are being used by similar projects, with similar risks, in the same branch and in the same region, like Interlagos, São Francisco, Zillo Lorenzetti, Rio Pardo. All these are CDM projects in the validation phase.

3. *The DOE should clarify how it has validated the sensitivity analysis, as required in paragraph 17 of EB 41, Annex 45 guidance on investment analysis.*

Paragraph 17 of the *"Guidance of investment analysis"* establishes the following:

The DOE should assess in detail whether the range of variations is reasonable in the project context. Past trends may be a guide to determine the reasonable range. As a general point of departure variations in the sensitivity analysis should at least cover a range of +10% and 10%, unless this is not deemed appropriate in the context of the specific project circumstances. In cases where a scenario will result in the project activity passing the benchmark or becoming the most financially attractive alternative the DOE shall provide an assessment of the probability of the occurrence of this scenario in comparison to the likelihood of the assumptions in the presented investment analysis, taking into consideration correlations between the variables as well as the specific socio-economic and policy context of the project activity.

Santa Cruz Cogeneration Project conducted the sensitivity analysis applying a range of variation of 5% increasing project's revenues and reducing project's costs. This was justified as being the average inflation registered in the country.

Since 1999 the Brazilian Central Bank established targets for the inflation registered in the country based on the IPCA index (from the Portuguese Amplified Consumers Price Index). The average inflation rate targeted during the last decade was of 4.78%. However, the observed average of IPCA from 1999 to 2008 was 7.12%[1].

When the observed inflation rate of 7.12% is considered, the IRR of the project is 10.82% which is still below company's WACC, which is equal to 11.13%. Project's IRR will only be equal to the Weighted Average Cost of Capital of the company when the energy price is BRL 146.32/MWh, which is a high number, as discussed below.

A 10% increase in the price of energy is not a reasonable scenario, and this can be evidenced by analysing the results of auctions that occurred in the governmental new energy auctions conducted by the Chamber of Electric Energy Commercialization (CCEE) during 2006, the year the company decided to implement the proposed project activity.

The first one was carried out on June 29th, 2006 and procured all sources of energy with operation scheduled to begin in three years. Thermoelectric power plants and hydroelectric power plants participated on the auction.

The other one took place on October 10th, 2006 and procured electricity derived from any sources, including thermoelectric power plants using natural gas or oil, and large hydropower plants.

The average price registered in the first mentioned auction was BRL 134/MWh. The average price obtained in the second auction was BRL 137/MWh for oil, natural gas and bagasse thermoelectric plants.

From these results, it is demonstrated that the energy price considered in the project's cash flow, of R$ 143.09, is already higher than the one expected at that time. First, because the energy price in which the IRR reaches the WACC (BRL 146.32/MWh) is 7% higher than the higher price registered in the auctions. Second, because the energy price in which the IRR reaches the WACC

[1] Brazilian targeted inflation rate available at < http://www.bcb.gov.br/Pec/metas/TabelaMetaseResultados.pdf>.

(BRL 157.41/MWh), when the sensitivity analysis is conducted using the 10% rate, is 15% higher than the higher price registered in the auctions.

All official documents related to the auctions (source of all the information above disclosed) are official and publicly available at the government's Chamber of Electric Energy Commercialization website (http://www.ccee.org.br/cceeinterdsm/v/index.jsp?vgnextoid=2e09a5c1de88a010VgnVCM100000aa01a8c0RCRD).

An annual cost reduction of 10% is not likely to happen, but even in this case, the IRR of the project would go up to 10.73%, which is still under the WACC value of 11.13%

4. The DOE should clarify how it has validated the barrier and common practice analysis.

a) Regarding common practice analysis:

Official and public references and source data used in the common practice analysis show that less than 20% of the sugar mills have developed expansion in order to export electricity to the grid (excluding CDM projects). Generation of electricity by sugar mills for the grid cannot be considered common practice in Brazil, where only 3.24% of the installed capacity consists of sugarcane bagasse generation[2] (most of it for sugar mill own consumption and operation only in the harvest season. In other words, if one wants to consider electricity supplied to the grid, the share is considerably smaller).

Coopersucar is one of the biggest cooperatives of the sector in Brazil. A comparison of Santa Cruz's efficiency in exporting electricity will be made with the sugar mills which are Coopersucar members, but not CDM projects. Financial data about these sugar mills is not publicly available. Hence, only a technical comparison can be made.

Santa Cruz has a ratio *exported KWh/tones of bagasse* of 199. Among Coopersucar members who have expanded to export electricity, the average ratio is 50.0 *exported KWh/tones of bagasse.*

Santa Cruz's efficiency is almost four times higher than the average efficiency among the mills which are not CDM projects. Hence, this project cannot be considered common practice.

A list of sugar mills, which are present in the Brazilian database of power generation with biomass in Brazil (http://www.aneel.gov.br/aplicacoes/capacidadebrasil/OperacaoGeracaoTipo.asp?tipo=5&ger=Combustivel&principal=Biomassa) with an installed capacity over 50 MW (the capacity of Santa Cruz is 75 MW), is presented below.

[2] ANNEL, Banco de Informações da Geração (http://www.aneel.gov.br/aplicacoes/capacidadebrasil/OperacaoCapacidadeBrasil.asp, accessed on 20/02/2009),

Sugar mill	Installed Power (KW)	City/State	Situation regarding CDM and Coopersucar membership
Colombo	65,500	Ariranha - SP	cdm
Rafard	50,000	Rafard - SP	cdm (in 2008) and coopersucar member
Vale do Rosário	93,000	Morro Agudo - SP	cdm and coopersucar member
Barra Grande de Lençóis	62,900	Lençóis Paulista - SP	cdm and coopersucar member
Cerradinho	75,000	Catanduva - SP	cdm
Colorado	52,760	Guaíra - SP	cdm
Equipav	58,400	Promissão - SP	cdm and coopersucar member
Santa Terezinha (Tapejara)	50,500	Tapejara - PR	cdm and coopersucar member
Costa Pinto	75,000	Piracicaba - SP	cdm and coopersucar member
Santa Elisa - Unit I	58,000	Sertãozinho - SP	cdm and coopersucar member
Equipav II	80,000	Promissão - SP	cdm and coopersucar member

It turns out that all of them are CDM projects, in different phases, and most of them are also Coopersucar members.

In this way, there are no plants in the state of São Paulo, which are not CDM projects, and export energy in the same scale as Santa Cruz. This information stresses the fact that Santa Cruz project is not the common practice.

b) Regarding barrier analysis:

In the PDD, it was cited an academic article, which shows that alternative energy regulation in Brazil has fragilities, and those fragilities can create difficulties for investing in this sector. Alexandre Salem Szklo and Claudia Rosana Felisberto , the authors of the article, are academic researchers in one of the most important Brazilian universities, the Federal University of Rio de Janeiro. The Curriculum of Mr. Szklo is registered in the Brazilian Catalogue of Research Group (http://lattes.cnpq.br/5314056414907898), and it shows that he has written dozens of articles on this subject, since 1993.

This is a written documentation of independent expert judgments from a university, as required by the "Tool for the demonstration and assessment of additionality", version 05, page 10.

In the PDD, it was also mentioned that the revenues of selling electricity represent 8.76% of the total revenues of Santa Cruz. In this way, the focus of the company is to invest in the production of sugar and alcohol, not of energy.

Anyway, regardless of how clear it is that the mentioned barriers influence investment decisions, it is impossible to classify such barriers as prohibitive. Therefore, the barrier analysis is provided here as anecdotal evidence, supporting the benchmark investment analysis. The investment analysis shows that the project activity is not financially attractive to the investor. And the barrier analysis is added to the PDD in order to show that not only the pure numbers of the financial analysis must be taken into account, when investing in a project.

5. *The DOE should clarify how it has validated the selection of the reference plants and the baseline assumption that, in the absence of the project activity, the plant electricity generation efficiency would have been lower.*

The PPs supplied the DOE with complete information regarding the selection of the reference plants. Regarding the baseline assumption that, in the absence of the project activity, the plant electricity generation efficiency would have been lower, it was considered that Usina Santa Cruz would build a new mill with the same sugarcane processing capacity, but without export of energy. This would attend their needs for the expansion of sugar and alcohol production, with the use of cheaper boilers, than the ones used in the project. In this way, this new hypothetical mill would have the same electrical efficiency as the ones presented as reference plants, which are new mills in Brazil, with no export of energy, and a low electrical efficiency.

6. *The DOE should clarify how the excess bagasse produced is currently being disposed of.*

The sugar mills generally store an amount of bagasse for the next season in order to start plant operations and make tests when the new crop season/ harvest begins. In Brazil, bagasse is stored from the end of the harvest season, in November, until the beginning of the following harvest season, in April/May. In this way, the excess bagasse produced by Santa Cruz in a harvest is stored for no longer than a year and burned in the following harvest.

Confident that the above initial comments help to adequately address the raised issues we remain available at any time for additional clarifications.

Best regards,

On behalf of the Project Participants

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ANNEX A

B.4 Description of how the baseline scenario is identified and description of the identified baseline scenario:

Santa Cruz S.A - Açúcar e Álcool Cogeneration Project uses bagasse for the generation of heat and electricity. The project activity involves the replacement of an existing biomass residue fired power plant by a new biomass residue fired power plant. The replacement increases the power generation capacity. In the absence of the project activity, the existing plant would also be replaced by a new biomass residue fired power plant (referred to as "reference plant"), however, this reference plant would have a lower efficiency of electricity generation than the project plant (e.g. by using a low-pressure boiler instead of a high-pressure boiler). The same type and quantity of biomass residues as in the project plant would be used in the reference plant.

The plausible baseline scenario were identified using version 2.2 of the *"Combined tool to identify the baseline scenario and demonstrate additionality"* for the different components of the project activity, which are: power, heat and biomass. Hence, the following four Steps were applied:

STEP 1. Identification of alternative scenarios;
STEP 2. Barrier analysis;
STEP 3. Investment analysis (if applicable);
STEP 4. Common practice analysis.

Step 1: Identification of alternative scenarios

Step 1a: Define alternative scenarios to the proposed CDM project activity

According to the methodology there are different possible baseline scenarios for power, heat and biomass. The description of how these scenarios were analyzed is presented below.

For power generation:

P1: The proposed project activity not undertaken as a CDM project activity.
This may be an alternative baseline scenario.

P2: The continuation of power generation in an existing biomass residue fired power plant at the project site, in the same configuration, without retrofitting and fired with the same type of biomass residues as (co-)fired in the project activity.
Excluded, because the existing biomass residue fired power plant could not provide the same amount of electrical energy, which will be provided by the project plant.

P3: The generation of power in an existing plant, on-site or nearby the project site, using only fossil fuels
Excluded, because neither there are plants nearby the project site, nor use sugar mills in Brazil fossil fuels for power generation.

P4: The generation of power in the grid.
Thismay be an alternative baseline scenario.

P5: The installation of a new biomass residue fired power plant, fired with the same type and with the same annual amount of biomass residues as the project activity, but with a lower efficiency of electricity

generation (e.g. an efficiency that is common practice in the relevant industry sector) than the project plant and therefore with a lower power output than in the project case.
Thise may be an alternative baseline scenario.

P6: The installation of a new biomass residue fired power plant that is fired with the same type but with a higher annual amount of biomass residues as the project activity and that has a lower efficiency of electricity generation (e.g. an efficiency that is common practice in the relevant industry sector) than the project activity. Therefore, the power output is the same as in the project case.
Excluded, because the new plant would have the same processing capacity as in the project activity - since the sugar mill core business is the production of sugar and ethanol – and, hence, a lower power output.

P7: The retrofitting of an existing biomass residue fired power, fired with the same type and with the same annual amount of biomass residues as the project activity, but with a lower efficiency of electricity generation (e.g. an efficiency that is common practice in the relevant industry sector) than the project plant and therefore with a lower power output than in the project case.
Excluded, because a new boiler would be needed to process the same amount of biomass residues as in the project activity, which is higher than in the pre-project period.

P8: The retrofitting of an existing biomass residue fired power that is fired with the same type but with a higher annual amount of biomass residues as the project activity and that has a lower efficiency of electricity generation (e.g. an efficiency that is common practice in the relevant industry sector) than the project activity.
Excluded, because this new plant would need to have the same processing capacity as in the project activity, which is higher than in the pre-project period – and new boilers would be needed for this purpose, not retroffited ones.

P9: The installation of a new fossil fuel fired captive power plant at the project site.
Excluded, because sugar mills in Brazil do not generate heat nor power burning fossil fuels.
Therefore, the plausible identified alternatives for the baseline scenarios for power generation are Scenarios P1, and P4 in conjunction with P5.

For heat generation:

H1: The proposed project activity not undertaken as a CDM project activity
This may be an alternative baseline scenario.

H2: The proposed project activity (installation of a cogeneration power 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)
This may be an alternative baseline scenario.

H3: The generation of heat in an existing cogeneration plant, on-site or nearby the project site, using only fossil fuels
Excluded, because sugar mills in Brazil do not use fossil fuels for heat generation.

H4: The generation of heat in boilers using the same type of biomass residues
Excluded, because the boilers in the plant site, before the project plant, would not have the capacity to generate the same amount of heat as it is generated in the project activity.

H5: The continuation of heat generation in an existing cogeneration plant, fired with the same type of biomass residues as in the project activity, and implementation of the project activity, not undertaken as a CDM project activity.
Excluded, because the existing boilers in the plant site, before the project, would not have the capacity to generate the same amount of heat as in the project activity;

H6: The generation of heat in boilers using fossil fuels
Excluded, because sugar mills in Brazil do not use fossil fuels for heat generation.

H7: The use of heat from external sources, such as district heat
Excluded, because sugar mills in Brazil do not use heat from external sources.

H8: Other heat generation technologies (e.g. heat pumps or solar energy)
Excluded, because sugar mills in Brazil do not use other heat generation technologies.

Therefore, the plausible identified alternatives for the baseline scenario for heat generation are Scenarios H1 and H2.

For biomass generation:

B1: The biomass residues are dumped or left to decay under mainly aerobic conditions. This applies, for example, to dumping and decay of biomass residues on fields.
Excluded, because sugar mills in Brazil use biomass residues for energy generation purposes.

B2: The biomass residues are dumped or left to decay under clearly anaerobic conditions. This applies, for example, to deep landfills with more than 5 meters. This does not apply to biomass residues that are stock-piled or left to decay on fields.
Excluded, because sugar mills in Brazil use biomass residues for energy generation purposes.

B3: The biomass residues are burnt in an uncontrolled manner without utilizing it for energy purposes.
Excluded, because sugar mills in Brazil use biomass residues for their energy generation purposes.

B4: The biomass residues are used for heat and/or electricity generation at the project site.
This may be an alternative baseline scenario.

B5: The biomass residues are used for power generation, including cogeneration, in other existing or new grid-connected power plants.
Excluded, because sugar mills in Brazil use biomass residues for their own energy generation.

B6: The biomass residues are used for heat generation in other existing or new boilers at other sites
Excluded, because sugar mills in Brazil use biomass residues for their own energy generation.

B7: The biomass residues are used for other energy purposes, such as the generation of biofuels.
Excluded, because sugar mills in Brazil use biomass residues for their own energy generation.

B8: The biomass residues are used for non-energy purposes, e.g. as fertilizer or as feedstock in processes (e.g. in the pulp and paper industry)
Excluded, because sugar mills in Brazil use biomass residues for energy generation purposes.

Therefore, the only identified alternative for the plausible baseline scenario for biomass residues is Scenario B4.

Outcome of Step 1a: From the above, the results can be summarized as follows:
- For power: P1, P4 in conjunction with P5 are the plausible scenarios
- For heat: H1 and H2 are the plausible scenarios
- For biomass: B4 is the only plausible scenario

Sub-step 1b: Consistency with mandatory applicable laws and regulations

All the alternatives listed above are in compliance with the laws and regulations of the host country.

Outcome of Step 1b: all the alternatives listed in the outcome of step 1a are still valid.

One of the alternatives for power generation (P4) is not under the control of project participants. In this case, the combined tool recommends that the "Tool for the demonstration and assessment of additionality" is used. For biomass, the scenario is B4. The combined tool will from now on be used only for the definition of the heat baseline scenario

Step 2: Barrier analysis

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

No barriers that could prevent the above mentioned alternatives can be identified.

Outcome of Step 2a: none barriers can be listed.

Sub-step 2b: Eliminate alternative scenarios which are prevented by the identified barriers

The alternatives scenarios cannot be eliminated trough the barrier analysis.

Outcome of Step 2b: none scenarios are eliminated.

The scenarios still under consideration are:
- For heat: H1 and H2 are the *plausible* scenarios

Step 3: Investment analysis

The financial indicator that will be used to conduct the investment analysis for the heat generation component is thecost of delivered heat in $/GJ.

According to the combined tool this analysis is suitable "*in the case that:*
(a) There are only two alternatives remaining after Step 2, which include the proposed CDM project activity and one other alternative,
(b) Both scenarios do not incur any revenue other than CDM related revenue or incur exactly the same revenue other than CDM related revenue and
(c) The project incurs costs and the other remaining alternative does not incur costs, then a simply cost analysis can be applied. In this case it is sufficient to document that the proposed project activity undertaken without being registered as a CDM project incurs costs".

The alternatives are:

H1: The proposed project activity not undertaken as a CDM project activity

H2: The proposed project activity (installation of a cogeneration power 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). This efficiency is lower than the one considered in the proposed project activity.

A boiler with a higher efficiency that would be used in scenario H1 is 10 to 15% more expensive than the one with lower efficiency that would be used in scenario H2, considering both with the same steam production capacity (information provided by the Brazilian boiler manufacturer Dedini). In this way, there would be no sense to use a more expensive boiler, since the processes in the sugar mill use steam at low pressure.

In this sense, there won't be any revenues associated with the installation of a boiler of higher efficiency and considering it is more expensive, scenario H1 cannot be considered the most probable baseline scenario.

For biomass the scenario is B4. For heat generation the baseline scenario is H2. For power generation, one of the remaining alternatives is not under the control of project participants. In this case, the combined tool recommends that the "Tool for the demonstration and assessment of additionality" is used. This analysis is provided in section B.5. below, and the baseline scenarios P4 and P5 were defined as the alternative scenarios.

The scenario of ACM0006 under which the project is analyzed was identified after the study of the alternatives for the different components of the project. The result of that analysis of components gave the following results: a) the power generated by the project plant would in the absence of the project activity be generated (a) in the reference plant (alternative P5) and – since power generation is larger in the project plant than in the reference plant – (b) partly in power plants in the grid (alternative P4). The new project plant has the same technical lifetime as the reference plant; b) biomass: in the absence of the project, the biomass residues would have used for heat and/or electricity generation at the project site (alternative B4); c) Heat: in the absence of the project activity, the heat generated by the project plant would 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) (alternative H2). The identified alternatives for the different components of the project activity correspond to scenario 18.

Heat efficiency for the boilers of the baseline (average of the reference plants) is 7,277 KJ/Kg bagasse; for the boilers of the project, heat efficiency is 7,493 KJ/Kg bagasse. It is demonstrated that the thermal efficiency in the project plant is larger than the thermal efficiency of the plant considered in the baseline scenario. It is assumed that ERheat,y = 0 (see equation 1, in page 23) , so the project complies with scenario 18.

Neither there was biomass residues decay, nor has the biomass been burned in an uncontrolled manner, as biomass residues were used in the past to generate electricity at the project site, for internal consumption. For scenario #18, $BE_{biomass}$, y=0.

B.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered CDM project activity (assessment and demonstration of additionality):

In order to determine if the project activity is additional, the additionality tool version 05 approved by the Executive Board is applied. The following steps are applied:

Step 1. Identification of alternatives to the project activity consistent with the current laws and regulations

Sub-step 1a. Define alternatives to the project activity

To define the alternatives to the project activity, there are two-sided analysis, taking into consideration the perspective of the project owner and the perspective of the country.

From the project owner's perspective, the cogeneration project allows the company to export electricity to the grid. Without the project, as seen from the heat analysis above, the plant would operate with low energy efficiency and could not export electricity to the grid. Hence, the alternatives to the project activity are:

- The plant would operate with low energy efficiency and could not export electricity to the grid;
- hence, a) the power generated by the project plant would in the absence of the project activity be generated (a) in the reference plant (alternative P5) and – since power generation is larger in the project plant than in the reference plant – (b) partly in power plants in the grid (alternative P4).
- The project activity implemented without been registered as a CDM project activity (P1).

From the country's perspective, the alternative for producing a similar amount of energy, as the one Usina Santa Cruz – Açúcar e Álcool is to provide, would be to use current generation system, which is electricity supplied by large hydro and thermal power stations. Brazil is increasingly depending on thermal plants. In the most recent energy auctions in Brazil, the results were the following: in an auction which took place on July 26, 2007, there was in an increase of 1.781,8 MW into National Electric System, all of them from oil thermo plants[3]; in an auction which took place on October 16, 2007, there was in an increase of 4,353 MW into National Electric System, from which 69% originated from fossil fuel (oil, coal and natural gas) plants[4].

During a period of restructuring the entire electricity market, as is the current Brazilian situation, investment uncertainty is the main barrier for small renewable energy power projects. In this scenario, these projects compete with existing plants and with new projects, in which thermal plants usually attract the attention of financial investors.

Sub-step 1b. Consistency with mandatory laws and regulations

The usage of electricity from the grid is in complete compliance with all applicable legal and regulatory requirements. The use of thermal electricity in the generation system is not only in compliance with regulations but also of increasing importance. The proposed project activity is not the only alternative in compliance with regulations.

The following analysis will study the viability of the implementation of the project without being registered as a CDM project activity.***Step 2. Investment analysis***

Sub-step 2a. Determine appropriate analysis method

Additionality is demonstrated through an investment benchmark analysis (option III)

Sub-step 2b and 2c– Option III - benchmark analysis

The financial indicator identified for cogeneration project as the case of Santa Cruz is the project IRR, and the benchmark is derived from the company internal benchmark (weighted average capital cost of the company - WACC).

Calculation of the Weighted Average Cost of Capital (WACC)

The rate used to discount the business cash flow is also known as the weighted-average cost of capital (WACC). It converts the future cash flow into a present value to all investors, considering

[3] Source: http://www.epe.gov.br/Lists/LeilaoA32007/DispForm.aspx?ID=44

[4] Source: Newspaper Folha de S. Paulo, 17/10/2007, http://www1.folha.uol.com.br/fsp/dinheiro/fi1710200730.htm

that both creditors and shareholders expect compensation towards the opportunity cost of investing resources in a specific business instead of investing such resources in other business of equivalent risk.

The basic principle to be followed when calculating the WACC is the consistency of both the valuation method and the definition of the discounted cash flow. The formula used to estimate the company's WACC after taxes is:

WACC = [(Kd x (1-t) x Pd)+(Ke x (1-Pd))] *Equation A*

Where:

WACC= Weighted-average cost of capital
Kd= Cost of Debt (third-party capital)
t = Marginal corporate income tax
Pd= Debt as a percentage of total capitalization
Ke= Cost of Equity (own capital)

Considering that Santa Cruz - Açúcar e Álcool is being financed with their own capital and with other debtors, we have adopted the case of a leveraged company to calculate the firm's WACC.

Cost of debt (Kd) is 10.17% per year. It is the financing line of BNDES offered to Santa Cruz - Açúcar e Álcool (10.17% TJLP).

The company has a total Debt as a percentage of total capitalization (Pd) of 54.83%. The average of the marginal corporate income tax (t) is 34% per year (these data are presented in the spreadsheet "Santa Cruz - Cash flow with sensitivity analysis.xls", page "WACC", at F29 and L22.

Estimating the Cost of Equity (Ke) was done using the parameters observed in global financial markets, allowing the application of the CAPM (Capital Asset Pricing Model) model. Given these assumptions, the cost of capital in Brazil should be close to a global cost of capital, adjusted for local inflation and capital structure. It should be noted that, concerning the calculation of the inflation differential, we have used an estimation of the compounded difference between the local inflation rate and the US inflation rate, over ten years. Also, for calculation purposes, we have used a Beta - which measures systemic equity risk within the company's industry - typical of the environmental services sector. Thus, in order to calculate Santa Cruz - Açúcar e Álcool' cost of equity, we have used the following parameters5:

Cost of Equity(Ke) – Santa Cruz - Açúcar e Álcool		
10-year BB Credit risk premium over US Treasuries[6]	**Plus**	1.52%p.a.
10-year US/Brazil inflation differential	**Plus**	4.65%p.a.
Adjustment of Market Equity Risk with Beta of 1,04[7]	**Plus**	10.34%p.a.
International Market Equity Risk Premium		5.50%p.a.
Santa Cruz - Açúcar e Álcool Cost of Equity with Brazilian Country Risk		16.51%p.a.

[5] Copeland et al.; Measuring and Managing the Value of Companies; Third Edition.
[6] Source: Bloomberg
[7] Considering that Santa Cruz - Açúcar e Álcool is not listed in their stock exchanges, PPs decided to use similar sugar mills as the benchmark. Therefore PPs took the weighted average of the Beta of the two sugar mills listed in the Bovespa (Cosan and São Martinho).

Applying Ke=16.51% to the Equation A above:

WACC = [(10.17% x (1 - 34%) x 54.83% + (16.51%p.a. x (1- 54.83%)] = 11.13%p.a.

Thus, Santa Cruz's – Açúcar e Álcool Weighted Average Cost of Capital is equal to 11.13% p.a.., and this figure will be used to discount the company's cash flow throughout this study.

Financial Indicator, Internal rate of return (IRR)

Santa Cruz's cash flow (see annexed spreadsheet "Santa Cruz - Cash flow with sensitivity analysis.xls") shows that the IRR of the project without CERs, 9.30%, is lower than the WACC 11.13%. This evidences that project activity is not financially attractive to the investor.

Sub-step 2d: Sensitivity analysis

A sensitivity analysis was conducted by altering the following parameters:
- Increase in project revenue
- Reduction in running costs

Those parameters were selected as being the most likely to fluctuate over time. Financial analyses were performed altering each of these parameters by 5%, and assessing what the impact on the project IRR would be. See results in the Table below. The 5% variation was chosen from the average annual Brazilian inflation. The variation of the energy price is the value that affects most the IRR calculation. Since it is regulated by the yearly variation of an official index, the IPCA (Amplified Consumer Price Index), energy price variation is already taken into account in the cash flow. The energy price will not be affected by market variations. Hence, the variation of 5%, presented in this analysis, is only theoretical.

For the calculation, see annexed spreadsheet "Santa Cruz - Cash flow with sensitivity analysis.xls", rows 7 and 8.

Table 1 - Sensitivity analysis

Scenario	% change	IRR (%)
Original	-	9.30
Increase in project revenue	5%	10.36
Reduction in O&M project costs	5%	10.01

Therefore, the IRR of the project activity without being registered as a CDM project is below the WACC benchmark, evidencing that the project activity is not financially attractive to the investor. In this way, the only plausible alternative for the power scenario are P4 and P5.

Step 3. Barrier Analysis:

Sub-step 3a. Identify barriers that would prevent the implementation of the proposed CDM project ctivity

Institutional Barriers

An article written in 2004 by two professors of Energy Planning at the Universidade Federal do Rio de Janeiro analyzes Brazilian energy regulations and identifies four fragilities that can undermine their suitable implementation. Those fragilities refer to:

1) The guarantee of the purchase of electricity. Some points are still to be clarified, regarding:

   a) Minimum and maximum limits for the purchase of energy;
   b) the possibility of the ONS - Electrical System Operator to determine production increase or decrease, depending on the demand variation;
   c) Payment for the availability of production capacity, in periods when there is abundant energy offer.

2) Juridical problems in the public calls legislation. Some rules are not totally compatible with the legislation, what might even lead to contract annulations.

3) The way the energy price is presently established, through the calculation of an average price for each type of energy source, penalizes projects with a lower cost-benefit rate. The authors suggest that the prices should be set according to the characteristics of each project.

Link to this article (with an abstract in English): http://www.seeds.usp.br/pir/arquivos/congressos/CBPE2004/Artigos/PROINFA%20E%20CDE%20-%20QUESTIONAMENTOS%20SOBRE%20A%20LEGISLA%C7%C3O%20E%20REGULA.pdf

There is a rising demand for energy in Brazil, but it is not being attended by biomass plants. In the most recent energy auctions in Brazil, the results were the following: in an auction which took place on July 26, 2007, there was in an increase of 1.781,8 MW into National Electric System, all of them from oil thermo plants[8]; in an auction which took place on October 16, 2007, there was in an increase of 4,353 MW into National Electric System, from which 69% originated from fossil fuel (oil, coal and natural gas) plants[9].

In the energy auction for alternative energy sources, that took place on June 18, 2007, 2,803 MW were qualified, but only 638,64 MW were negotiated[10], what shows the lack of interest by most of the participants, due to the price and conditions presented. From the estimated 2,000 to 3,000 MW available from sugarcane bagasse plants, only 542 MW were sold.

The barriers mentioned above in the PDD are still valid in 2007, what can be evidenced by the fact that the generation of electrical energy from sugarcane bagasse represents only 2.69% of the total generation of electricity in Brazil (see table below).

[8] Source: http://www.epe.gov.br/Lists/LeilaoA32007/DispForm.aspx?ID=44

[9] Source: Newspaper Folha de S. Paulo, 17/10/2007, http://www1.folha.uol.com.br/fsp/dinheiro/fi1710200730.htm

[10] Source: http://www.epe.gov.br/PressReleases/20070618_1.pdf

Operating plants (as of 16/10/2007)							
Type		Installed capacity			Total		
		Number of plants	(kW)	%	Number of plants	(kW)	%
Hydro		658	76.776.350	70,91	658	76.776.350	70,91
Gas	Natural	78	10.162.302	9,39	108	11.313.280	10,45
	Processed	30	1.150.978	1,06			
Oil	Diesel	569	2.903.850	2,68	591	4.373.744	4,04
	Residual fuel	22	1.469.894	1,36			
Biomass	Sugarcane bagasse	235	2.916.021	2,69	279	3.973.995	3,67
	Black liquor	13	794.817	0,73			
	Wood	26	224.207	0,21			
	Biogás	2	20030	0,02			
	Rice residues	3	18920	0,02			
Nuclear		2	2.007.000	1,85	2	2.007.000	1,85
Coal	Coal	7	1.415.000	1,31	7	1.415.000	1,31
Wind		15	236850	0,22	15	236850	0,22
Import	Paraguay		5.650.000	5,46		8.170.000	7,55
	Argentina		2.250.000	2,17			
	Venezuela		200000	0,19			
	Uruguay		70000	0,07			
Total		**1.660**	**108.266.219**	**100**	**1.660**	**108.266.219**	**100**

Source: http://www.aneel.gov.br/aplicacoes/capacidadebrasil/OperacaoCapacidadeBrasil.asp

This trend is about to continue, as shown by the huge difference between biomass thermal plants and fossil fuel plants granted by ANEEL, as of 16/10/2007:

Classe of fuels used in Brazil - Grants			
Fuel	Quantity	Power (kW)	%
Biomass	30	249.834	2,48
Fossil	87	9.786.470	97,34
Others	7	18.100	0,18
Total	124	10.054.404	100

Core Business Barrier

The history of the sugarcane industry has demonstrated that the industry is a traditional stable business and has consistently helped to support the country's economy. It has historically enjoyed governmental support such as fixed prices and subsidies. Another characteristic of this sector is the specialization in commodity (sugar and ethanol) transactions. In addition to all those barriers mentioned above, it is important to understand that the sale of electricity from cogeneration represents only a small share of total annual revenues of sugar mills. As a consequence, sugar mills prefer investing in equipment related to their core business, the production of sugar and molasses. In general, the revenues of selling electricity in a cogeneration project represent less than 10 % of the total revenues of a sugar mill. For the Santa Cruz – Açúcar e Álcool cogeneration project, the sale of electricity represents 8.76 % of the total net revenues.

Sub-step 3b. Show that the identified barriers would not prevent the implementation of at least one of the alternatives (except the proposed activity):

As described above, the main alternative to the project activity is to continue the status quo, the sugarcane mills only concentrating their investments on sugar and ethanol. Therefore the barriers above have not affected the investment in other business opportunities.

Step 4. Common practice analysis

Sub-step 4a. Analyze other activities similar to the proposed project activity:

In 2003/2004 season, there were more than 320 sugar mills producing sugar, ethanol and electricity to supply their own energy consumption of which 226 were located at Brazilian central and south regions[11]. In the Brazilian South Region, less than 20% have developed expansion programs for their power plants (Anuário da Cana, Procana: 2003).

The potential to generate electricity for commercialization (exporting to the grid), is estimated at around 8.7 GW, for 2012-2013[12]. This potential has always existed and has grown as the sugarcane industry has grown. However, the investments to expand the sugar mills' power plants have only occurred since 2000. Although a flexible legislation allowing independent energy producers has existed since 1995, it was only after 2000 that sugar producers started to study this proposed project activity as an investment alternative for their power plants in conjunction with the introduction of the CDM.

Coopersucar is one of the biggest cooperatives of the sector in Brazil (*Jornal da Cana* – Sugarcane branch newspaper, October, 2006). Among Coopersucar member plants, considering the plants that do not have CDM projects, only 10% have increased their capacity in order to export energy to the grid in 2006[13]. Thus, the project activity shall not be considered as common practice in Brazil.

Sub-step 4b. Discuss any similar options that are occurring:

As shown above, there is a rising demand for energy in Brazil, but it is not being attended by biomass plants. In the most recent energy auctions in Brazil, the results were the following: in an auction which took place on July 26, 2007, there was in an increase of 1.781,8 MW into National Electric System, all of them from oil thermo plants[14]; in an auction which took place on October 16, 2007, there was in an increase of 4,353 MW into National Electric System, from which 69% originated from fossil fuel (oil, coal and natural gas) plants[15].

In the energy auction for alternative energy sources, that took place on June 18, 2007, 2,803 MW were qualified, but only 638,64 MW were negotiated[16], what shows the lack of interest by most of the participants, due to the price and conditions presented. From the estimated 2,000 to 3,000 MW available from sugarcane bagasse plants, only 542 MW were sold.

This situation stresses that the project activity shall not be considered as common practice.

[11] Açúcar e álcool do Brasil: Commodities da Energia e do Meio Ambiente**.** UNICA: 2004. Available at: www.portalunica.com.br

[12] UNICA - *União da Indústria de Cana-de-Açúcar* – Union of the Sugarcane Industry (www.portalunica.com.br)

[13] Copersucar - Cooperativa Produtores de Cana-de-açúcar, Açúcar e Álcool do Estado de São Paulo (São Paulo State Sugarcane, sugar and alcohol producers cooperatives). Data available only to cooperative members. This information can be also assessed in the article "*Usinas aproveitam co-geração e lucram com créditos de carbono*" available at: http://www.seagri.ba.gov.br/noticias.asp?qact=view&notid=8143

[14] Source: http://www.epe.gov.br/Lists/LeilaoA32007/DispForm.aspx?ID=44

[15] Source: Newspaper Folha de S. Paulo, 17/10/2007, http://www1.folha.uol.com.br/fsp/dinheiro/fi1710200730.htm

[16] Source: http://www.epe.gov.br/PressReleases/20070618_1.pdf

ANNEX B

CDM: Form for submission of requests for deviation (version 02) ***(To be used by the DOE, for requesting a deviation)***	
Name of the entity (DOE) submitting this form	SGS
Title of the project activity	"Santa Cruz S.A. - Açúcar e Álcool - Cogeneration Project"
Title/Subject (give a short title or specify the subject of your submission, maximum 200 characters):	Deviation request to allow the use of the **"Tool for the demonstration and assessment of additionality"** to assess the additionality of a project activity, under methodology ACM0006.
Deviation type:	a) ☒ Approved methodology (AM) If so, specify reference number, version and title of the AM: ACM0006 - Consolidated methodology for electricity generation from biomass residues --- Version 6.2 b) ☐ Provisions of registered project documentation If so, specify project number and which documentation : _____
Attach draft CDM-PDD of project activity:	☒ Yes, is attached.
Specify if you want this request to be treated as confidential:	☐ To be treated as confidential ☒ To be publicly available (UNFCCC CDM web site)
Date and signature for the DOE	
Description of the request for deviation Please use the space below to describe the deviation and substantiate the reason for requesting a deviation from approved methodologies (validation/registration stage) or provisions of registered project documentation (verification/issuance stage) .	

The reason for request for the deviation is as listed below:

According to the methodology ACM0006, version 6.2, Project participants shall identify the most plausible baseline scenario and demonstrate additionality using the latest approved version of the "Combined tool to identify the baseline scenario and demonstrate additionality". For Santa Cruz Project, Project participants are not using the "Combined tool", but the "Tool for the demonstration and assessment of additionality"

Explanation for the use of the "Tool for the demonstration and assessment of additionality"

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.

The use of the "Tool for the demonstration and assessment of additionality" is justified under the consideration 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, one of the alternatives 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".

A request for clarification AM_CLA_0120 was submitted to the Meth Panel and based on the clarifications received, which suggest that project proponents require a deviation, this deviation is being hereby requested, with the purpose of:
(i) Allowing that the baseline for incremental electricity, as defined in ACM0006, produced as a consequence of the project activity and exported to the grid is defined by default as being the grid; and
(ii) Allowing the use of the additionality tool to assess the additionality of the project activity.

As recommended by the Meth Panel, project proponents will select in *step 1* the baseline scenario for biomass residues and heat supply using the combined tool, as currently described in ACM0006.

Please use the space below to describe and substantiate the assessment of the DOE that the deviation does not require an amendment to the approved methodology used by the proposed project activity.

>>

[replace this bracket with text, the field will expand automatically with size of text]

Please use the space below to describe the impact of the deviation on the estimates of the emissions reductions for the proposed project activity with the use of approved methodology as existing and with the deviation. Please substantiate the estimations with relevant and verifiable data.	
>> The estimates of the emissions reductions for the proposed project activity are not altered as a consequence of this request for deviation.	
Link to the documentation made available at validation stage or the monitoring report	http://cdm.unfccc.int/Projects/Validation/DB/Q2NPZQR1719T8RGDX8M8WNV3X9NU92/view.html
If necessary, list attached files containing relevant information which is not available through the above link	• Initial comments from DOE and Project Participants in response for a request for review (http://cdm.unfccc.int/Projects/review.html).
Information to be completed by the secretariat	
Date when the form was received at UNFCCC secretariat	
Date of transmission to the Meth Panel and Executive Board	