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# VALIDATION REPORT

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**USJ – Açúcar e Álcool S/A**

**USJ Açúcar e Álcool S/A – Usina São Francisco Cogeneration Project**

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**SGS Climate Change Programme**

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**Summary:**

SGS Brazil, an affiliate of SGS United Kingdom Ltd. has made a validation of the CDM project activity “Usina São Francisco 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 Usina São Francisco and a site visit to Usina São Francisco unit located in Quirinópolis, Goiás, Brazil, where staff from the company and its consultant were interviewed.

The project is owned by USJ – Açúcar e Álcool S/A, a sugar cane based distillery.

Usina São Francisco will operate using 1 boiler, 1 generator and 1 turbo-generator. From 2008 it's predicted an expansion, increasing Usina São Francisco capacity.

Total amount of emission reductions for the first crediting period is estimated to be 428,950 tCO<sub>2</sub>.

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.

The letter of approval from the government of Brazil was issued on 21<sup>st</sup> November 2007.

The only amendment made to this version of the validation report compared to the report version 3 dated 13/09/2007 referred in the Brazilian LoA is related to information provided regarding evidence that the incentive from the CDM was seriously considered in the decision to proceed with the project activity.

Subject: CDM Validation	<b>Indexing Terms</b>
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## Abbreviations

ACM	Approved Consolidated Methodology
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
DNA	Designated National Authority
DOE	Designated Operational Entity
EF	Emission Factor
NIR	New Information Request
PDD	Project design Document
SGS	Société Générale de Surveillance

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## 1. Introduction

### 1.1 Objective

The USJ – Açúcar e Alcool S/A has commissioned SGS to perform the validation of: USJ Açúcar e Alcool S/A – Usina São Francisco 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 construction of a sugar mill capable of generating power surplus for sale (cogeneration plant), which will be operational in April 2007. Usina São Francisco is located in Quirinópolis, Goiás, Brazil.

The mill will apply biomass power conversion technology for simultaneous power and heat generation. Bagasse, a renewable fuel source by-product from sugar cane processing, will be used as biomass.

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. This displacement of energy thus creates a reduction of greenhouse gas emissions. This project also will provide social and economic benefits that contribute to the local sustainable development.

The project is owned by USJ – Açúcar e Alcool S/A, a sugar cane based distillery.

Usina São Francisco will operate 1 boiler, 1 generator and 1 turbo-generator. From 2008 an expansion is predicted, increasing Usina São Francisco's capacity. The project is expected to generate an annual average of 236,500 MWh power surplus, operating at full capacity during the season. Total amount of emission reductions for the first crediting period (7 years) is 428,950 t CO<sub>2</sub>e.

#### Baseline Scenario:

In the absence of the project activity, a new biomass power plant would be installed instead of the project activity at the same site and with the same thermal firing capacity, but with a lower electric efficiency than the project plant. The electricity would be generated by fossil-fuel thermal plants that would have otherwise dispatched to the grid.

#### With-project Scenario:

Usina São Francisco will displace energy from the grid by both avoiding the consumption of power in the project and by delivering clean energy to the same grid utilizing bagasse as biomass for electricity generation.

#### Leakage:

No leakage was identified for this project.

Environmental and Social Impacts:

To be in compliance with legal requirements, a Preliminary Environmental Report – “Relatório Ambiental Preliminar” (RAP) has been completed and a report was produced, containing information about the use of resources, legal requirements, impacts on climate and air quality, geological and soil impacts, impacts on surface and groundwater, impacts on the flora and fauna, and social and economic issues. Mitigation measures and a monitoring plan were also included into the RAP.

The impacts identified from the study above-mentioned were not considered significant and a full Environmental Impact Assessment was not legally required.

The project sponsors are fulfilling the requirements of the State environmental Agency (Agência Ambiental do Estado de Goiás) which issued the Installation License – nº 369/2005 (20/10/2005) and the Operation License (01/06/2007, valid until 22/02/2011).

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 the USJ, the owner of the project, to continue supporting its social initiatives and partnership with local communities.

**1.4 The Names and Roles of the Validation Team Members**

<b>Name</b>	<b>Role</b>
<i>Aurea Nardelli</i>	<i>Lead Assessor</i>
<i>Fabian Gonçalves</i>	<i>Local assessor</i>

## 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.

<b>Checklist Question</b>	<b>Means of Verification (MoV)</b>	<b>Comment</b>	<b>Draft and/or Final Conclusion</b>
<i>The various requirements are linked to checklist questions the project should meet.</i>	<i>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.</i>	<i>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.</i>	<i>This is either acceptable based on evidence provided (Y), or a <b>Corrective Action Request (CAR)</b> due to non-compliance with the checklist question (See below). <b>New Information Request (NIR)</b> is used when the validation team has identified a need for further clarification.</i>

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:

- mistakes have been made with a direct influence on project results;
- validation protocol requirements have not been met; or
- 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](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.

The letter of approval was issued on 21st November 2007.

#### 3.2 Baseline Selection and Additionality

Usina São Francisco Cogeneration Project is a greenfield power project. It is a new biomass power generation plant at a site where currently no power generation occurs. It uses one type of biomass: bagasse, a by-product of the sugar production. The power generated by the project plant would in the absence of the project activity be purchased from the grid.

As the starting date of the project activity is before the date of validation, evidence that the incentive from the CDM was seriously considered in the decision to proceed with the project activity must be provided.

The starting date of “USJ Açúcar e Álcool S/A – Usina São Francisco Cogeneration Project.” CDM Project Activity, as stated in section C.1 of the PDD, is June 27th, 2005.

The company had already considered the possibility of developing the CDM project and the possible benefits of it. The evidence is a formal commercial proposal from Econergy (consultant CDM Company) dated on May 17th, 2005.

Please see below the initial excerpt of the proposal, which explicitly shows its connection with the proposed project activity.

*“As required, we present a revision of the proposal of consultancy and evaluation on carbon credits. This proposal covers the development of the Project Design Document (PDD), advisory during the Validation process, advisory for the emission of the Letter of Approval by the Brazilian Government, advisory during the Registry process, as well as in the commercialization of the Carbon Credits, maintenance of the Project. Also, advisory in the periodic verification processes and, consequently, Certification of the credits under the United Nations during the expected life time of the project.*

*Considering the above mentioned stages, we present our proposal for Usina São João and Usina Quirinópolis which is a part of Usina São João Group. The detailed description of our services is attached to this letter.”*

It is also verified that during the validation site visit in the beginning of 2006, the construction of the mill was under initial stages. Carbon credits were discussed nearly one year before the construction of the plant. Hence, it can be said that they were considered during the implementation of the project activity.

The methodology applied to the project is the “ACM0006 – Consolidated baseline methodology for grid-connected electricity generation from biomass residues” (version 4).

The project falls under Scenario 4 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 to be used in the Usina São Francisco 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. The expected increasing in the bagasse production will be due to Usina São Francisco natural expanding business and can not be attributed to the implementation of the cogeneration project.

(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.

The project demonstrated additionally using the “Tool for the demonstration and assessment of additionality” (version 3). The relevant information for the analysis of additionality was presented in detail in the PDD.

In the version 1 of PDD, Section B.3, under “investment barrier” discussion, it was mentioned that a PPA (Power Purchase Agreement) was signed, but it was verified during the site visit that no PPA has been signed. NIR 6 was raised. To close out NIR 6, the PDD was revised, to excluded general information about PPA and Proinfa that are not applicable to the project. The discussion on the additionality was revised and the Step 2 (Investment analysis) was used. NIR 6 was closed out.

The Investment Analysis was supported by the cash flow of the project (Ref. 8) and respective sensitivity analysis (Ref. 9). Values and assumptions used in that analysis were discussed by the validation team with the project developer and were considered reasonable. Documented evidences were provided regarding electricity prices used to estimate the project revenues (Ref. 12). The data about the investments from BNDES (80 % of the project) were confirmed from publicly available information at the BNDES website.

From the benchmark analysis (option III of the step 2), it was demonstrated that the IRR (9.49%) of the project was lower than the company internal benchmark – WACC (10.69%). The sensitivity analysis considered increasing in the project revenue and reduction in running costs. Financial analyses were performed altering 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.

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) and that 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).

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 to the sources of GHG included in the project boundary, all the sources mentioned by the methodology were discussed and justification related to their inclusion/exclusion was provided in the PDD.

As described in the PDD and required by ACM0006, the emission reductions due to the displacement of electricity was calculated by multiplying the net quantity of increased electricity generated with sugar cane bagasse as a result of the project activity ( $EG_y$ ) with the CO<sub>2</sub> baseline emission factor for the electricity displaced due to the project ( $EF_{Electricity,y}$ ). 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:

$$ER = EG_y \times EF$$

EF was calculated *ex-ante*, following the steps and formulas defined by ACM0002. The value obtained was 0.2611 tCO<sub>2</sub>/MWh. Formulas and data used for EF calculation were verified during the validation and details are included in the PDD.

Verified that the  $EG_y$  (Net quantity of increased electricity generation as a result of the project activity) was determined as the difference between the electricity generation in the project plant and the quantity of electricity that would be generated by other power plant(s) using the same quantity of biomass residues that

is fired in the project plant. The average net energy efficiency of electricity generation in (the) other power plant(s) that would use the biomass residues fired in the project plant in the absence of the project was calculated considering data of electricity generation of the Coopersucar plants, as presented in the Ref. 13. The efficiency calculated was 0.021 MWhel/MWhbiomass.

The quantity of biomass combusted in the project plant was estimated based on the total of sugar cane to be milled yearly. It was considered that bagasse represents 30% of the total sugar cane consumed in the mill. The literature reference provided in the PDD was confirmed.

For the estimative, the net calorific value of the bagasse was considered with 50% of moisture content, which is the moisture obtained for this kind of biomass and applied in the Brazilian sugar cane sector. In this case, no conversion of the quantity of bagasse to dry basis had to be done, as the quantity and the NCV were measured in the same moisture content.

For the ER estimative, it was considered the NCV measured in the plant (2.09 MWh/ton). For the calculation of the efficiency of the reference plant, the NCV used was 2.47 MWh/ton (value from literature, confirmed during the validation).

The spreadsheet with ERs calculation was provided (Ref. 7). Formulas and data used were confirmed.

### **3.4 Application of Monitoring Methodology and Monitoring Plan**

As required by ACM0006, for the scenario 4, the following parameters will be monitored:

- Net quantity of electricity generated in the project plant;
- Quantity of bagasse combusted in the project plant;
- Moisture content of the bagasse;
- Net calorific value of bagasse.

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 1: It was informed that the project will monitor environmental indicators (section "Environmental impacts"). No information about monitoring of sustainable development indicator was provided in the Monitoring plan. See CAR 1 close out details in the following report section "Environmental impacts".
- NIR 2: There was no information in PDD regarding training of monitoring personnel.

It was verified on-site and discussed with the project developer that the project will be part of the operational daily activities of Usina São Francisco. It was included in the PDD that Usina São Francisco will be responsible for organising and training of the staff in the appropriate monitoring, measurement and reporting techniques. Personnel will be trained on the monitoring of the emission of SOx and NOx and the production of solid residues at the combustion of bagasse in the boilers. NIR 2 was closed out.

- CAR 3: No information was provided in the PDD about emergencies procedures in case of unintended emissions.

Verified on-site (discussing the project with the client) that it is not expected to have unintended emissions, the bagasse that will be stored is just to start plant operations, maximum 5% of the total amount and for a period shorter than 1 year. CAR 3 was closed out.

- CAR 4: Procedures for calibration of monitoring equipment were not presented or mentioned in the PDD and Monitoring plan.

The PDD was revised. Additional information was included under the Description of Monitoring Plan. It was informed that the calibration of the electricity meters will be done according to internal procedures of Usina São Francisco and the regulations of CCEE. The procedures will be implemented before the first verification period. CAR 4 was closed out.

- CAR 5: Procedures for maintenance of monitoring equipment and installations were not mentioned in the PDD and Monitoring Plan. It was informed that the maintenance and installation of monitoring equipment will be done according to the internal procedures of Usina São Francisco. This information was included in the

revised PDD. Procedures will be implemented before the first verification period (see also observation 2). CAR 5 was closed out.

It is important to highlight that the plant was under construction when the site visit was carried out (March 2006) and no operational activities had been implemented yet. Observation 2 was raised: Specific internal procedures, as described in the revised PDD, will be prepared and implemented before the first verification period.

### **3.5 Project Design**

The project correctly applied the PDD template (version 03.1). No changes in the document were observed. The specific requirements were addressed correctly under each header of the template.

The project design engineering reflects current good practices. It will be applied the "Rankine cycle turbine". The project will operate with a configuration using 1 boiler, 1 generator and 1 turbo-generator. It was confirmed on-site verifying the project documents (Ref. 4). The technology to be employed is one of the most known option for simultaneous power and heat generation from biomass.

The starting date of the project activity informed in the PDD was 27/06/2005. It is the date of the first authorization issued by ANEEL for the plant (Ref. 16).

The operational lifetime will be 25 years, which exceed the crediting period.

It was assumed a renewable crediting period, starting on 01/04/2007 or on the date of registration of the CDM project activity, whichever is later.

Observation 1: The updated authorization issued by ANEEL for the installed capacity of 96MW shall be available since the plant start to operate with this capacity. It should be verified in the verification assessment.

The new authorization for the project, considering 96MW of installed capacity, was issued by ANEEL on 18/05/2007. Observation 1 was closed out.

### **3.6 Environmental Impacts**

The environmental assessment report was verified during the site visit (Ref.2). The study concluded that the project is not resulting in significant adverse environmental impacts. Mitigation measures and a monitoring plan were proposed for the impacts identified and have been implemented.

During the site visit, copy of the project's Construction License (LI n° 369/2005, issued by State Environmental Agency of Goiás on 20/10/2005) was provided to the auditor (Ref. 3). After the site visit, the operation license was issued and a copy was sent to SGS (LO n° 366/2007, issued on 01/06/2007).

It was verified that no monitoring of sustainable development indicators was presented in the PDD. The document mentioned that the project is required to control some environmental aspect to obtain the environmental license, but there is no detail about the indicators. CAR 1 was raised.

The project manager provided information that the monitoring of environmental impacts will be carried out according to the requirements of the State Environmental Agency. Usina São Francisco will monitor the emission of SOx, NOx and CO and the production of solid residues at the combustion of bagasse in the boilers, following the CONAMA resolutions 005/89, 003/90 and 008/90. In addition, Usina São Francisco will monitor other environmental aspects, such as water quality, erosion and noise level. Project "Margem Verde", a reforestation programme, will be also monitored. Regarding social impacts, social programs activities and worker's health indicators will be monitored. The PDD was updated to include the above-mentioned details. CAR 1 was closed out.

### **3.7 Local stakeholder comments**

Local stakeholders were invited by letters to comment on the Usina São Francisco Cogeneration CDM 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 municipality mayor house of Quirinópolis;
- The municipality chamber of Quirinópolis;

- The local attorneys' office of the State of Goiás;
- The Brazilian NGO Forum;
- The state environmental agency of Goiás;
- The municipality's environmental authority of Quirinópolis;
- Rural Workers's Union of Quirinópolis.

It was verified by the local assessor that Usina São Francisco submitted these letters in February/2006 (by checking the formal records of post office). Copies of records were provided to SGS (Ref. 11).

No comments were received.

#### **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 SGS website <http://cdm.unfccc.int/Projects/Validation/DB/1UBO9CZM5QMS7BNWTEE1LM216ADH7N/view.html> and were open for comments from 08 February 2006 until 09 March 2006. Comments were invited through the UNFCCC CDM homepage.

##### **4.2 Compilation of all Comments Received**

No comments received to the DOE during the 30 days commenting period.

##### **4.3 Explanation of how Comments Have Been Taken into Account**

No comments received.

## 5. Validation Opinion

Actions have been taken to close out 6 findings and 1 observation. The outstanding observation does not preclude the validation process, but should be addressed before the verification process.

SGS has performed a validation of project: USJ Açúcar e Álcool S/A – Usina São Francisco 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 the cogeneration 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 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.

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

<i>Date</i>	<i>Name</i>	<i>Position</i>	<i>Short description of subject discussed</i>
02/03/2006	Narciso Fernando Bertholdi	Business Development Manager	Project responsibility
02/03/2006	João Batista Saccomano	Project Manager	Technical issues
02/03/2006	José Ieda Neto	Industrial Manager	Technical issues and operational issues
02/03/2006	Mauricio F. de Oliveira	Production Manager	Operational issues
02/03/2006	Ricardo Besen	Consultant	PDD developing, monitoring plan, baseline



## 7. Document References

### Category 1:

- /1/ Project Design Document, USJ Açúcar e Alcool S/A – Usina São Francisco Cogeneration Project, version 1 (03/02/2006); version 2 (07/03/2006); version 3 (13/03/2006); version 4 (18/07/2006); version 5 (06/09/2006); version 6 (19/01/2007); version 7 (21/02/2007) and version 8 (13/09/2007); version 8a (02/04/2008).
- /2/ Consolidated baseline and monitoring methodology for grid-connected electricity generation from biomass residues – ACM0006, version 04 (01/11/2006).
- /3/ Consolidated baseline and monitoring methodology for grid-connected electricity generation from renewable sources – ACM0002, version 6 (11/05/2006)

### Category 2:

- /4/ Plant of the project (showing the elements of the project, as the extraction, boiler, energy generation and energy sub-station) – only hard copy.
- /5/ Environmental study “USJ Açúcar e Alcool S/A, Estudo de impacto ambiental” (October 2004, DBO Engenharia) – only hard copy
- /6/ Environmental license for installation (License n° 369/2005, issued by Agência Ambiental de Goiás on 20/10/2005).
- /7/ Emission reduction estimative (“geração estimada credits carbono USJ\_2007 02 21”.xls)
- /8/ Investment analysis – cash flow (“USJ - Cash Flow\_2007.09.13”.xls)
- /9/ Sensitivity analysis (“USJ - Sensitivity analysis\_2007.09.13”.xls)
- /10/ Letter to stakeholder
- /11/ Local stakeholders - mailing records
- /12/ Electricity prices
- /13/ Copersucar Reference plants Brazil.xls
- /14/ Information about sugar cane sector in Brazil (compilation of documents available in internet)
- /15/ Authorization issued by ANEEL (for expansion of the installed capacity)
- /16/ Authorization issued by ANEEL (for 40 MW installed capacity)
- /17/ Environmental license for operation (01/06/2007)

## A.1 Annex 1: Local Assessment Checklist

USJ Açúcar e Alcool S/A – Usina São Francisco Cogeneration Project. CDM.Val0392

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 SGS Brazil

Issue	Findings	Source /Means of Verification	Further Action / Clarification / Information Required?
Verify ANEEL (Brazilian Electricity Regulatory Agency) license.	<p>Verified “Aviso de Adjudicação” n° 002/2005-ANEEL, December 2005. Contracting energy for new projects with posterior concession and authorization.</p> <p>Verified on-site the ANEEL Resolution 359 of 14/11/2005 (Ref. 16); this authorization was canceled in order to be substituted to one that authorizes Usina São Francisco to operate with an installed capacity of 96 MW).</p>	Site visit/DR	<p>Observation 1: the updated ANEEL license shall be available for the verification process (when the capacity change to 96 MW). Close out details: the new authorization was issued in May 2007 (Ref.15).</p>

<p>Confirm the location and specifications of the project, as described in the PDD.</p> <p>Confirm that the project is a "greenfield" project.</p>	<p>Verified that the project is been installed. Location is confirmed.</p> <p>Checked the plant of the project, with information about the construction and elements to be installed (Ref. 4). It was confirmed that the project will use only sugar cane bagasse as biomass and that the bagasse will be generated in the same site of electricity generation.</p> <p>Verified on-site the turbine (confirmed the capacity).</p>	<p>Site visit/DR</p>	<p>No</p>
<p>Check the environmental requirements and license</p>	<p>Copies of the environmental study (Ref. 5) and of the Installation License issue by the State Environmental Agency of Goiás(Ref. 6) were provided.</p>	<p>DR</p>	<p>No</p>
<p>Verify the local stakeholder consultation: evidences of invitation, date, media used, names of the organizations/persons invisted to comment.</p>	<p>Copies of the letters sent to the stakeholders were provided (Ref.10). Documented evidences of the invitation were available (receipts of the mail service, Ref. 11). It was confirmed that the organizations mentioned in the PDD were</p>	<p>DR</p>	<p>No</p>

	consulted.		
Ask copy of the spreadsheet used for calculation of Estimated emission reductions.	The spreadsheet was provided (Ref. 7)  Formulas and values applied were confirmed with the figures presented in the PDD and required by ACM0006.	DR	No
Confirm the financing from BNDES (80% of the project)	This was discussed with the project manager. The information was also available on <a href="http://www.bndes.gov.br/noticias/2005/not189_05.asp">http://www.bndes.gov.br/noticias/2005/not189_05.asp</a>	DR/I	No
Confirm data and calculation of baseline Emission factor (grid)	Data and formulas applied were verified. They comply with ACM0002 (this methodology is used for EF grid calculation).	DR/I	No
Check data about the "reference plant" (revised PDD to comply with version 4 of ACM0006)	A spreadsheet with Coopersucar plants data of generation and bagasse consumption were provided (Ref. 13). Data about efficiency used in the PDD were confirmed.	DR	No
Verify evidences of prices of energy used in the investment analysis.	Documented evidences were provided (Ref. 12, documented from ANEEL and CCEE). The project manager explained how the prices are calculated.	DR/I	No

## A.2 Annex 2: Validation Protocol

Requirement	Description	
Participation requirements	The participation requirements as set out in Decision 17/CP.7 need to be satisfied	Covered in table 1
Baseline and monitoring methodology	The baseline and monitoring methodology complies with the requirements pertaining to a methodology previously approved by the Executive Board	Baseline methodology is covered in table 2 Monitoring methodology is covered in table 4
Additionality	The project activity is expected to result in a reduction in anthropogenic emissions by sources of greenhouse gases that are additional to any that would occur in the absence of the proposed project activity	Covered in table 3
Monitoring plan	Provisions for monitoring, verification and reporting are in accordance with relevant decisions of the COP/MOP	Covered in table 5
Environmental impacts	Project participants have submitted to the designated operational entity documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts and, if those impacts are considered significant by the project participants or the host Party, have undertaken an environmental impact assessment in accordance with procedures as required by the host Party;	Covered in table 6
Comments by local stakeholders	Comments by local stakeholders have been invited, a summary of the comments received has been provided, and a report to the designated operational entity on how due account was taken of any comments has been received;	Covered in Table 7
Other requirements	The project activity conforms to all other requirements for CDM project activities in relevant decisions by the COP/MOP and the Executive Board.	Covered in Table 8

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

REQUIREMENT	MoV	Ref	Comment	Draft Finding	Concl
1.1 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.	DR	PDD	No Annex I in this project.	OK	Ok
1.2 The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof, and be entered into voluntarily	DR	PDD	No Letter of approval by host country (Brazil) has been submitted to the validator. The letter will be	Send the validation report to DNA.	The letter of approval was issued on 21 <sup>st</sup> November 2007. Ok

REQUIREMENT	MoV	Ref	Comment	Draft Finding	Concl
			issued after analysis of the validation report by Brazilian DNA.		
1.3 All Parties (listed in Section A3 of the PDD) have ratified the Kyoto protocol and are allowed to participate in CDM projects	DR	UNFCCC website	Yes, Brazil – date of ratification 23-august-2002.	Ok	Ok
1.4 The project results in reductions of GHG emissions or increases in sequestration when compared to the baseline; and the project can be reasonably shown to be different from the baseline scenario	DR	PDD	Yes, the project activity will use renewable biomass for electricity generation (applying the ACM0006).	Ok	Ok
1.5 Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days (45 days for AR projects), and the project design document and comments have been made publicly available	DR	CDM website	Yes. The project is publicly available until 09-Mar-2006.  Public available : <a href="http://cdm.unfccc.int/Projects/Validation/DB/1UBO9CZM5QMS7BNWTEE1LM216ADH7N/view.html">http://cdm.unfccc.int/Projects/Validation/DB/1UBO9CZM5QMS7BNWTEE1LM216ADH7N/view.html</a>  No comments were received.	Verify	Ok
1.6 The project has correctly completed a Project Design Document, using the current version and exactly following the guidance	DR	PDD	Yes. The Version 03.1 (28 July,2006) is used.	Ok	OK
1.7 The project shall not make use of Official Development Assistance (ODA), nor result in the diversion of such ODA	DR	PDD	No ODA have been provided for this project.  The Project is financed by BNDES - Banco Nacional de Desenvolvimento Econômico e Social. (Brazilian Development Bank)	To be verified	Ok
1.8 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			N/A		

REQUIREMENT	MoV	Ref	Comment	Draft Finding	Concl
applied throughout the PDD?					
1.9 Does the project meet the additional requirements detailed in:  Table 9 for SSC projects Table 10 for AR projects  Table 11 for AR SSC projects			N/A		
1.10 Is the current version of the PDD complete and does it clearly reflect all the information presented during the validation assessment?	DR	PDD	Yes. The current version is complete. Details about the project, as location, capacity, type of biomass to be used and references mentioned in the PDD were confirmed on-site and by contacts (by phone and e-mail) with the project developers.	Ok	Ok
1.11 Does the PDD use accurate and reliable information that can be verified in an objective manner?	DR	PDD	In the version 1 of PDD, Section B.3, under "investment barrier" discussion, it was mentioned that a PPA (Power Purchase Agreement) was signed, but it was verified on-site that no PPA has been signed. NIR 6 was raised. To close out NIR 6, it was informed by the project developer that the project has started to prepare a contract to sell the energy to be generated. The PDD was revised and during the revision, the project proponent decided to exclude the barrier analysis and discuss the additionality under investment analysis. NIR 6 was closed out.	NIR 6	Ok

**Table 2 Baseline methodology(ies) (Ref: PDD Section B and E and Annex 3 and AM) Normal CDM projects only**

CHECKLIST QUESTION	Ref.	MoV	COMMENTS	Draft Concl	Final Concl
2.1 Does the project meet all the applicability criteria listed in the methodology	PDD ACM 0006	DR	<p>The methodology applied is ACM0006 ("Consolidated baseline methodology for grid-connected electricity generation from biomass residues"). The methodology is applicable to grid-connected and biomass residue fired electricity generation project activities, including cogeneration plants. The applicability criteria are discussed in the PDD and it was confirmed that the project meets all of them: Usina São Francisco is a "Greenfield" project - it is a new biomass power generation plant at a site where currently no power generation occurs; 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-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 (from November to the following April).</p> <p>The biomass used in this project will not</p>	Ok	Ok



CHECKLIST QUESTION	Ref.	MoV	COMMENTS	Draft Concl	Final Concl
			be transformed in any way before being used as a fuel.		
2.2 Is the project boundary consistent with the approved methodology	PDD ACM 0006	DR	<p>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.</p> <p>Regarding to the sources of GHG included in the project boundary, all the sources mentioned by the methodology were discussed and justification related to their inclusion/exclusion was provided in the PDD.</p>	Ok	Ok
2.3 Are the baseline emissions determined in accordance with the methodology described	PDD ACM 0006	DR	<p>For the baseline scenario 4, baseline emissions due to the natural decay or burning of anthropogenic sources of biomass residues was not applied.</p> <p>See below (under 2.6) details about ER calculation.</p>	Ok	Ok
2.4 Are the project emissions determined in accordance with the methodology described	PDD ACM 0006	DR	Project emissions will be = 0	Ok	Ok
2.5 Is the leakage of the project activity determined in accordance with the methodology described	PDD ACM 0006	DR	<p>No leakage was considered.</p> <p>LE=0</p>	Ok	Ok

CHECKLIST QUESTION	Ref.	MoV	COMMENTS	Draft Concl	Final Concl
2.6 Are the emission reductions determined in accordance with the methodology described	PDD ACM 0006	DR	<p>As described in the PDD and required by ACM0006,</p> $ER = EG_y \times EF$ <p>EF was calculated ex-ante, following the steps and formulas defined by ACM0002. The value obtained was 0.2611 tCO<sub>2</sub>/MWh.</p> <p>Formulas and data used for EF calculation were verified during the validation and details are included in the PDD.</p> <p>Verified that the <i>EG<sub>y</sub></i> (Net quantity of increased electricity generation as a result of the project activity) is determined as the difference between the electricity generation in the project plant and the quantity of electricity that would be generated by other power plant(s) using the same quantity of biomass residues that is fired in the project plant.</p> <p>Net quantity is the exported energy plus the energy consumed internally in the sugar mill minus the energy consumed in the auxiliary systems.</p> <p>The average net energy efficiency of electricity generation in (the) other power plant(s) that would use the biomass residues fired in the project plant in the</p>	Ok	Ok

CHECKLIST QUESTION	Ref.	MoV	COMMENTS	Draft Concl	Final Concl
			<p>absence of the project was calculated considering the Coopersucar plants, as presented in the Ref. 13. The efficiency calculated was 0.021 MWhel/MWhbiomass.</p> <p>The quantity of biomass combusted in the project plant was estimated based on the total of sugar cane to be milled yearly. It was considered that bagasse represents 30% of the total sugar cane consumed in the mill. The literature reference of this percentage was confirmed. For the estimative, the net calorific value of the bagasse was considered under 50% of moisture, which is the moisture obtained for this kind of biomass. In this case, no conversion of the quantity of bagasss to dry basis had to be done, as the quantity and the NCV were measured in the same moisture content.</p> <p>The spreadsheet with ERs calculation was provided (Ref. 7). Formulas and data were confirmed.</p>		

**Table 3 Additionality (Ref: PDD Section B3 and AM) Normal CDM projects only**

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl	Final Concl
3.1 Does the PDD follow all the steps required in the methodology to determine the additionality	PDD ACM 0006	DR	Yes. The steps of the "Tool for the demonstration and assessment of additionality" (version 3) were correctly followed.	Ok	Ok
3.2 Is the discussion on the additionality clear and have all assumptions been supported by transparent and documented evidence	PDD ACM 0006	DR	<p>Verified during site visit that some information listed in the additionality discussion (investment barrier), were not applicable to the project (see NIR 6). To close out NIR 6, the PDD was revised, to excluded general information about PPA and Proinfa that are not applicable to the project. The discussion on the additionality was revised and the Step 2 (Investment analysis) was used. NIR 6 was closed out.</p> <p>The Investment Analysis was supported by the cash flow of the project (Ref. 8) and respective sensitivity analysis (Ref. 9). Values and assumptions used in that analysis were discussed by the validation team with the project developer. Documented evidences were provided regarding electricity prices (Ref. 12).</p> <p>From the benchmark analysis (option III of the step 2), it was</p>	NIR 6	<p>NIR 6 was closed out.</p> <p>Ok</p>

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl	Final Concl
			demonstrated that the IRR (9.49%) of the project was lower than the company internal benchmark – WACC (10.69%).		
3.3 Does the selected baseline represent the most likely scenario among other possible and/or discussed scenarios?	PDD ACM 0006	DR	<p>The baseline scenario selected, as defined by ACM0006, was scenario 4. It was correctly applied to the project: Usina São Francisco uses bagasse for the generation of heat and electricity. The project activity is a new biomass power generation plant at a site where currently no power generation occurs.</p> <p>It was considered that in the absence of the project activity, a new biomass power plant (“reference plant”) would be installed instead of the project activity at the same site and with the same thermal firing capacity, but with a lower electric efficiency than the project plant.</p> <p>Information to support the efficiency used for the “reference plant” was provided in Ref. 13, considering the plants of Coopersucar cooperative.</p>	Ok	Ok
3.4 Is it demonstrated/justified that the project activity itself is not a likely baseline scenario	PDD ACM 0006	DR	Yes, it was discussed in the PDD (section B.5) that the project is not the most attractive investment (if compared with the	Ok	Ok

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl	Final Concl
			internal benchmark of the company) and that the generation of electricity by sugar mills is not the 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).		

**Table 4 Monitoring methodology (PDD Section D and AM) Normal CDM projects only**

CHECKLIST QUESTION	Ref.	MoV	COMMENTS	Draft Concl	Final Concl
4.1 Does the project meet all the applicability criteria listed in the monitoring methodology	PDD ACM	DR	Yes, see item 2.1 of this checklist.	Ok	Ok
4.2 Does the PDD provide for the monitoring of the baseline emissions as required in the monitoring methodology	PDD ACM	DR	For the baseline scenario 4, baseline emissions due to the natural decay or burning of anthropogenic sources of biomass residues was not applied.  The calculation of the baseline EF grid followed the requirements of ACM0002 (it was calculated as a combined margin ( <i>CM</i> ), consisting of the combination of operating margin ( <i>OM</i> ) and build margin ( <i>BM</i> ) factors). EF was calculated ex-ante.  The “reference plant”, required for	Ok	Ok

CHECKLIST QUESTION	Ref.	MoV	COMMENTS	Draft Concl	Final Concl
			<p>scenario 4 was in compliance with ACM 0006 requirements.</p> <p>The following parameters will be monitored:</p> <ul style="list-style-type: none"> <li>- Net quantity of electricity generated in the project plant;</li> <li>- Quantity of bagasse combusted in the project plant;</li> <li>- Moisture content of the bagasse;</li> <li>- Net calorific value of bagasse.</li> </ul>		
4.3 Does the PDD provide for the monitoring of the project emissions as required in the monitoring methodology	PDD ACM	DR	The project emissions will be zero.	Ok	Ok
4.4 Does the PDD provide for the monitoring of the leakage as required in the monitoring methodology	PDD ACM	DR	Leakage is not applicable.	Ok	Ok
4.5 Does the PDD provide for Quality Control (QC) and Quality Assurance (QA) Procedures as required in the monitoring methodology	PDD ACM	DR	The project was not implemented when the site visit was carried out. It was verified that the Description of the Monitoring Plan, presented in the PDD, provided QA/QC procedures.	Ok	Ok

**Table 5 Monitoring plan (PDD Annex 4) Normal CDM projects only**

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl	Final Concl
5.1 Monitoring of Sustainable Development Indicators/ Environmental Impacts	PDD	DR	CAR 1: It was informed that the project will monitor environmental indicators (section "Environmental impacts"). No information about monitoring of sustainable development indicator was provided in the	CAR 1	<p>CAR 1 was closed out.</p> <p>Ok</p>

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl	Final Concl
			Monitoring plan. To close out CAR 1, the PDD was revised and additional information was included regarding the monitoring of environmental and social indicators. It was included in the section "Description of the monitoring plan". CAR 1 was closed out.		
5.1.1 Does the monitoring plan provide the collection and archiving of relevant data concerning environmental, social and economic impacts?	PDD	DR	See CAR 1	CAR 1	CAR 1 was closed out. Ok
5.1.2 Is the choice of indicators for sustainability development (social, environmental, economic) reasonable?	PDD	DR	See CAR 1	CAR 1	CAR 1 was closed out. Ok
5.1.3 Will it be possible to monitor the specified sustainable development indicators?	PDD	DR	See CAR 1	CAR 1	CAR 1 was closed out. Ok
5.1.4 Are the sustainable development indicators in line with stated national priorities in the Host Country?	PDD	DR	See CAR 1	CAR 1	CAR 1 was closed out. Ok
5.2 Project Management Planning					
5.2.1 Is the authority and responsibility of project management clearly described?	PDD	DR, I	Yes, the project sponsor will be responsible for management of the CDM project.	Ok	Ok
5.2.2 Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described?	PDD	DR, I	Yes. The project sponsor is responsible for registration, monitoring and measurement. It is informed in the PDD in the "Description of Monitoring Plan" and	Ok	Ok



CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl	Final Concl
			confirmed on-site.		
5.2.3 Are procedures identified for training of monitoring personnel?	PDD	DR, I	<p>There are no information about training in the PDD. NIR 2 was raised.</p> <p>It was verified on-site and discussed with the project developer that the project will be part of the operational daily activities of Usina São Francisco. It was included in the PDD that Usina São Francisco will be responsible for organising and training of the staff in the appropriate monitoring, measurement and reporting techniques.</p> <p>NIR 2 was closed out.</p>	NIR 2	NIR 2 was closed out. Ok
5.2.4 Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	PDD	DR, I	<p>No information was provided in the PDD about emergencies procedures. CAR 3 was raised.</p> <p>Verified on-site (discussing the project with the client) that it is not expected to have unintended emissions, the bagasse that will be stored is just to start plant operations, maximum 5% of the total amount and for a period shorter than 1 year. CAR 3 was closed out.</p>	CAR 3	CAR 3 was closed out. Ok
5.2.5 Are procedures identified for calibration of monitoring equipment?	PDD	DR	No information about calibration (of meters used for weigh the biomass, electricity meters and other analysis) was provided in the monitoring plan. CAR 4 was raised.	CAR 4	CAR 4 was closed out. Ok

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl	Final Concl
			<p>The PDD was revised. Additional information was included under the Description of Monitoring Plan. It was informed that the calibration of the electricity meters will be done according to internal procedures of Usina São Francisco and the regulations of CCEE. The procedures will be implemented before the first verification period.</p> <p>CAR 4 was closed out.</p>		
5.2.6 Are procedures identified for maintenance of monitoring equipment and installations?	PDD ACM	DR, I	<p>No information was provided in the PDD regarding maintenance. CAR 5 was raised.</p> <p>It was informed that the maintenance and installation of monitoring equipment will be done according to the internal procedures of Usina São Francisco. This information was included in the revised PDD. Procedures will be implemented before the first verification period.</p> <p>CAR 5 was closed out.</p>	CAR 5	<p>CAR 5 was closed out.</p> <p>Ok</p>
5.2.7 Are procedures identified for monitoring, measurements and reporting?	PDD ACM	DR, I	<p>Information was mentioned in the PDD. To be verified on-site.</p> <p>It was confirmed by interviews during site visit that Usina São Francisco staff will be responsible for monitoring, measurements and</p>	Ok	Ok

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl	Final Concl
			reporting.		
5.2.8 Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	PDD	DR	The plant was under construction when the site visit was carried out (March 2006) and no operational activities had been implemented yet..  Observation 2: Specific internal procedures, as described in the revised PDD, will be prepared and implemented before the first verification period	Obs. 2	Ok Observation 2
5.2.9 Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	PDD	DR	See Observation 2 above.	Obs. 2	Ok Observation 2
5.2.10 Are procedures identified for review of reported results/data?	PDD ACM	DR	The reliability of the net electricity value used for ERs calculation will be assured through second-party verification of the amount of electricity sold by Usina São Francisco.	Ok	Ok
5.2.11 Are procedures identified for internal audits of GHG project compliance with operational requirements where applicable?	PDD ACM	DR	The project is under construction and the procedure will be prepared and implemented. See Observation 2.	Obs.2	Ok Observation 2
5.2.12 Are procedures identified for project performance	PDD ACM	DR	The project was not implemented when the site visit was carried out. It was	Ok	Ok

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl	Final Concl
reviews before data is submitted for verification, internally or externally?			informed in the PDD that the main data used for ER calculation (the net electricity generated) will be cross-checked with the electricity invoices.		
5.2.13 Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	PDD ACM	DR	The project is under construction and the procedure will be prepared and implemented. See Observation 2	Obs. 2	Ok Observation 2

**Table 6 Environmental Impacts (Ref PDD Section F and relevant local legislation) Normal CDM projects only**

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl	Final Concl
6.1 Has an analysis of the environmental impacts of the project activity been sufficiently described?	PDD	DR	The PDD mentioned the environmental licensing process and the reference of the licenses obtained for the project. It was verified on site the environmental study performed by a consultancy company (Ref. 5) and the environmental license for installation of the project (issued by the Environmental Agency of Goiás, LI 369/2005, Ref. 6).  The operation license was issued after the site visit, on 01/06/2007. Copy was sent to SGS (Ref. 17).	Ok	Ok
6.2 Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	PDD ACM	DR	A full environmental impact assessment was not required for the cogeneration plant. The compliance with the legal requirements was confirmed by the	Verify	Ok

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl	Final Concl
			licenses issued by the environmental agency (see Ref. 6 and Ref. 17).		
6.3 Will the project create any adverse environmental effects?	PDD ACM	DR	It is not expected. The monitoring plan described in the revised PDD included the monitoring of environmental indicators, such as: emission of SO <sub>x</sub> , NO <sub>x</sub> and CO and the production of solid residues at the combustion of bagasse; water quality, erosion, noise level and reforestation activities.	Ok	Ok
6.4 Are transboundary environmental impacts considered in the analysis?	PDD ACM	DR	Yes, as verified in the environmental study (Ref. 5).	Ok	Ok
6.5 Have identified environmental impacts been addressed in the project design?	PDD ACM	DR	Yes, as verified in the environmental study (Ref. 5). In addition, the environmental licenses define measures for environmental control and monitoring.	Ok	Ok
6.6 Does the project comply with environmental legislation in the host country?	PDD ACM	DR	Yes, as confirmed by the licenses issued by the environmental agency of Goiás.	Ok	Ok

**Table 7 Comments by local stakeholders (Ref PDD Section G) All CDM projects activities**

CHECKLIST QUESTION	Ref.	MoV	COMMENTS	Draft Concl	Final Concl
7.1 Have relevant stakeholders been consulted?	PDD	DR	Yes, the list of organizations consulted was provided in the PDD and confirmed on-site from mailing receipts (Ref. 11)	Ok	Ok

CHECKLIST QUESTION	Ref.	MoV	COMMENTS	Draft Concl	Final Concl
7.2 Have appropriate media been used to invite comments by local stakeholders?	PDD, letters	DR, I	During site visit, it was verified that letters were sent to local stakeholders (Ref.10).	To be verified	OK
7.3 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?	PDD	DR	<p>The stakeholder consultation was processed according Brazilian DNA requirement. Letters were sent in February/2006 to:</p> <p>The municipality mayor house of Quirinópolis;  The municipality chamber of Quirinópolis;  The local attorneys' office of the State of Goiás;  The Brazilian NGO Forum;  The state environmental agency of Goiás;  The municipality's environmental authority of Quirinópolis;  The Rural Workers' Union of Quirinópolis.</p> <p>Records were verified on-site and copies provided to SGS (Ref. 11).</p>	To be verified	Ok
7.4 Is a summary of the stakeholder comments received provided?	PDD ACM	DR	No comments were received.	Ok	Ok
7.5 Has due account been taken of any stakeholder comments received?	PDD ACM	DR	No comments were received.	Ok	Ok

**Table 8 Other requirements**

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
<b>8.1 Project Design Document</b>					
8.1.1 Editorial issues: does the project correctly apply the PDD template and has the document been completed without modifying/adding headings or logo, format or font.	PDD	DR	Yes, the template 03.1 was applied. No changes have been observed.	Ok	Ok
8.1.2 Substantive issues: does the PDD address all the specific requirements under each header. If requirements are not applicable / not relevant, this must be stated and justified	PDD	DR	Yes, the requirements were addressed correctly under each header.	Ok	Ok
<b>8.2 Technology to be employed</b>					
8.2.1 Does the project design engineering reflect current good practices?	PDD	DR	Yes. It will applied the "Rankine cycle turbine".  The project will operate with a configuration using 1 boiler, 1 generator and 1 turbo-generator. It was confirmed on-site verifying the project documents (Ref. 4).	Ok	Ok
8.2.2 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?	PDD	DR	The technology employed is probably the most known option for simultaneous power and heat generation from biomass.	Ok	Ok
8.3 Is the project technology likely to be substituted by other or more efficient technologies within the project period?	PDD	DR	It is expected no.	Ok	Ok
8.2.4 Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period?	PDD	DR, I,	There are no comments about training requirements in the PDD.  To be confirmed by local assessor.  See NIR 2 close out	See NIR 2.	Ok

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
			details.		
<b>8.3 Duration of the Project/ Crediting Period</b>					
8.3.1 Are the project's starting date and operational lifetime clearly defined and reasonable?	PDD	DR	Starting date: 27/06/2005 (date of the first authorization issued by ANEEL for the plant, see Ref. 16). Lifetime – 25 years. Information provided in the PDD, section C.1.	Ok	Ok
8.3.2 Is the assumed crediting time clearly defined and reasonable (renewable crediting period of max. two x 7 years or fixed crediting period of max. 10 years)?	PDD	DR	Starting crediting period: 01/04/2007 or on the date of registration of the CDM project activity, whichever is later. Renewable crediting period (7 years).	Ok	Ok
8.3.3 Does the project's operational lifetime exceed the crediting period	PDD	DR	Yes, expected operational lifetime of the project activity is 25 years.	Ok	Ok

**Table 9 Additional requirements for SSC projects – NA**

**Table 10 Additional requirements for AR projects – NA**

**Table 11 Additional requirements for SSC AR projects - NA**

**Table 12 Additional information to be verified by local assessors / site visit**

See complete local checklist in Annex 1.



### A.3 Annex 3: Findings Overview

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.

Date: 17/02/2006

Raised by: Aurea Nardelli/Fabian Gonçalves

No.	Type	Issue	Ref
1	CAR	Section F mentions that the project is required to control some environmental aspect to obtain the environmental license. No monitoring of sustainable development indicators are presented in the PDD.	5.1

Date: 07/03/2006

The monitoring of project environmental impacts is made according to the requirements of the State Environmental Agency, *Agência Ambiental de Goiás*.

Usina São Francisco will monitor the emission of SO<sub>x</sub>, NO<sub>x</sub> and CO and the production of solid residues at the combustion of bagasse in the boilers, following the CONAMA resolutions 005/89, 003/90 and 008/90.

Usina São Francisco will also monitor environmental aspects, such as water quality, erosion and noise level. Project "Margem Verde", a reforestation programme, has already planted 70,000 trees, and its maintenance will be monitored.

There will be also monitoring of Social Programmes, like the "Usina do Saber" project, which selects children and offers transportation to the schools with headquarters in the residential area of the company. The health of their workers will also be monitored periodically.

All these actions are stated in Annex 4 (revised PDD).

Date: 09/03/2006 – Aurea Nardelli.

[Acceptance and close out]: The PDD was revised and additional information was included regarding the monitoring of environmental and social indicators. It was included in the section "Description of the monitoring plan". CAR 1 was closed out.

Date: 17/02/2006

Raised by: Aurea Nardelli/ Fabian Gonçalves

No.	Type	Issue	Ref
2	NIR	There is no information regarding training of monitoring personnel.	5.2.3

Date: 07/03/2006

Since the project is part of the regular activities of Usina São Francisco, there will be no specific training procedure. Additional information was included in the revised PDD. It can be mentioned that personnel will be trained on the monitoring of the emission of SO<sub>x</sub> and NO<sub>x</sub> and the production of solid residues at the combustion of bagasse in the boilers.

Date: 09/03/2006 – Aurea Nardelli.

[Acceptance and close out]: It was verified on-site and discussed with the project developer that the project will be part of the operational daily activities of Usina São Francisco. It was included in the PDD that Usina São Francisco will be responsible for organising and training of the staff in the appropriate monitoring, measurement and reporting techniques. Training will be provided before the starting date of the credit period. NIR 2 was closed out.

Date: 17/02/2006

Raised by: Aurea Nardelli/Fabian Gonçalves

No.	Type	Issue	Ref
3	CAR	There are not procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions.	5.2.4
<p>Date: 07/03/2006</p> <p>The only possible unintended emissions from the project would be due to biomass left to decay. Sugar mills, generally, store a small amount of bagasse for the next season in order to start plant operations when the new crop season/ harvest begins. In Usina São Francisco, this volume is foreseen to be insignificant, approximately 3%, so there will be no unintended emissions.</p> <p>Date: 09/03/2006 - Aurea Nardelli.</p> <p>[Acceptance and close out]: Verified on-site (discussing the project with the client) that it is not expected to have unintended emissions. The bagasse that will be stored is just to start plant operations, maximum 5% of the total amount and for a period shorter than 1 year. CAR 3 was closed out.</p>			

Date: 17/02/2006

Raised by: Aurea Nardelli/Fabian Gonçalves

No.	Type	Issue	Ref
4	CAR	Procedures for calibration of monitoring equipment are not presented or mentioned in the PDD and Monitoring plan.	5.2.5
<p>Date: 07/03/2006</p> <p>The calibration of meters will be done according to the internal procedures of Usina São Francisco and the regulations of CCEE (<i>Câmara de Comercialização de Energia Elétrica</i> - Electric Energy Wholesale Market). This information was included in the PDD..</p> <p>Date: 09/03/2006 – Aurea Nardelli.</p> <p>[Acceptance and close out]: The PDD was revised. Additional information was included under the “Description of Monitoring Plan”. It was informed that the calibration of the electricity meters will be done according to internal procedures of Usina São Francisco and the regulations of CCEE. The procedures will be implemented before the first verification period.</p> <p>CAR 4 was closed out.</p>			

Date: 17/02/2006

Raised by: Aurea Nardelli/Fabian Gonçalves

No.	Type	Issue	Ref
5	CAR	Procedures for maintenance of monitoring equipment and installations are not mentioned in the PDD and Monitoring Plan.	5.2.6
<p>Date: 07/03/2006</p> <p>The maintenance and installation of monitoring equipment will be done according to the internal procedures of Usina São Francisco. Additional information was included in the PDD.</p> <p>Date: 09/03/2006 – Aurea Nardelli.</p> <p>[Acceptance and close out]: This information was included in the revised PDD under “Description of the monitoring plan”. As the project is not implemented yet (it was under construction when the validation was carried out), procedures will be implemented before the first verification period (see also Observation 2).</p> <p>CAR 5 was closed out.</p>			

Date: 02/03/2006

Raised by: Aurea Nardelli/Fabian Gonçalves

No.	Type	Issue	Ref
6	NIR	The version 1 of PDD, Section B.3, under “investment barrier” discussion, it was mentioned that a PPA (Power Purchase Agreement) was signed, but it was verified on-site that no PPA has been signed.	1.11 / 3.2
<p>Date: 07/03/2006</p> <p>Usina São Francisco did not apply for Proinfa, because there was not enough time to fulfil all the application requirements in the most recent energy auction.</p> <p>Date: 09/03/2006 – Aurea Nardelli.</p> <p>[Acceptance and close out]: It was informed that the project starts to prepare a contract to sell the energy to be generated. The PDD was revised and during the revision, the project proponent decided to exclude the barrier analysis and discuss the additionality under investment analysis. NIR 6 was closed out.</p>			

Observations:

1) The updated ANEEL license shall be available for the verification process (when the capacity changes to 96 MW).

Close out details: The new authorization was issued by ANEEL on 18/05/2007 (Ref.15)

2) Specific internal procedures, as described in the revised PDD (section B.7.2 “Description of the monitoring plan”), shall be prepared and implemented before the first verification period.

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

### Statement of Competence

Name: Aurea Nardelli

SGS Affiliate: Brazil

#### Status

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

#### Validation

#### Verification

- |                         |                                     |                                     |
|-------------------------|-------------------------------------|-------------------------------------|
| - Local Assessor        | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| - Lead Assessor         | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| - Assessor              | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| / Trainee Lead Assessor |                                     |                                     |

#### Scopes of Expertise

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

Approved Member of Staff by: Marco van der Linden      Date: 16<sup>th</sup> March 2007

## Statement of Competence

Name: Fabian Goncalves

SGS Affiliate: Brazil

### Status

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

### Validation

### Verification

- |                                       |                                     |                                     |
|---------------------------------------|-------------------------------------|-------------------------------------|
| - Local Assessor                      | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| - Lead Assessor                       | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| - Assessor<br>/ Trainee Lead Assessor | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |

### Scopes of Expertise

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

Approved Member of Staff by: Siddharth Yadav Date: 28<sup>th</sup> July 2007