Industrie Service

Validation Report

SOCIEDAD AGRÍCOLA E INDUSTRIAL SAN CARLOS S.A.

Validation of the

San Carlos Bagasse Cogeneration Project (SCBCP), Ecuador

Report No. 649402, Revision 01

2005, December 23

TÜV Industrie Service GmbH TÜV SÜD Group

Carbon Management Service
Westendstr. 199 - 80686 Munich - GERMANY

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Subject:	Validation of a CDM Project
Executing Operational Unit:	TÜV Industrie Service GmbH TÜV SÜD Group Carbon Management Service Westendstr. 199 - 80686 Munich Federal Republic of Germany
Client:	Sociedad Agrícola e Industrial San Carlos S.A. Elizalde 114 y Pichincha Marcelino Maridueña, Guayaquil Ecuador
Contract approved by:	Werner Betzenbichler
Report Title:	Validation of the San Carlos Bagasse Cogeneration Project (SCBCP), Ecuador
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Summary:

The Certification Body "Climate and Energy" has been ordered by Sociedad Agrícola e Industrial San Carlos S.A. (Guayaquil) to perform a validation of the above mentioned project.

Using a risk based approach the validation of this project has been performed by document reviews and on-site inspection, audits at the locations of the project and interviews at the offices of the project developer and the project owner.

In summary, it is TÜV SÜD´s opinion that the "San Carlos Bagasse Cogeneration Project (SCBCP)", as described in the revised project design document of December 2005, meets all relevant UNFCCC requirements for the CDM, set by the Kyoto Protocol, the Marrakesh Accords and relevant guidance by the CDM Executive Board and that the project furthermore meets all relevant host country criteria and correctly applies the baseline and monitoring methodology AM0015

Hence TÜV SÜD will recommend the SCBCP for registration as CDM project activity by the CDM Executive Board.

Additionally the assessment team reviewed the estimation of the projected emission reductions. We can confirm that the indicated amount of emission reductions of 306 118 tonnes CO_{2e} over a crediting period of seven years, resulting in a calculated annual average of 43 731 tonnes CO_{2e}, represent a reasonable estimation using the assumptions given by the project documents.

Work carried out by:	Markus Knödlseder (Project manager, GHG lead auditor, Auditor Environmental Management Systems (ISO 14001)) Mauro Fadda (GHG auditor, local expert) Javier Castro (technical expert, GHG trainee)	Internal Quality Control by: Werner Betzenbichler

Abbreviations

AE	Applicant Operational Entity
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CR	Clarification Request
DOE	Designated Operational Entity
EIA / EA	Environmental Impact Assessment / Environmental Assessment
ER	Emission reduction
GHG	Greenhouse gas(es)
KP	Kyoto Protocol
MP	Monitoring Plan
PDD	Project Design Document
TÜV SÜD	TÜV Industrie Service GmbH TÜV SÜD Group
UNFCCC	United Nations Framework Convention on Climate Change
VVM	Validation and Verification Manual

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1 INTRODUCTION

1.1 Objective

Sociedad Agrícola e Industrial San Carlos S.A. has commissioned TÜV Industrie Service GmbH TÜV SÜD Group (TÜV SÜD) to validate the San Carlos Bagasse Cogeneration Project (SCBCP). The validation serves as design verification and is a requirement of all CDM projects. 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 a requirement for all CDM projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).

UNFCCC criteria refer to the Kyoto Protocol criteria and the CDM rules and modalities as agreed in the Bonn Agreement and the Marrakesh Accords.

1.2 Scope

The validation scope is defined as an independent and objective review of the project design document, the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations. TÜV SÜD has, based on the recommendations in the Validation and Verification Manual 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.

The audit team has been provided with a draft PDD in November 2005. Based on this documentation a document review and a fact finding mission in form of an on site audit has taken place. The PDD submitted in November 2005 was made public in the global stakeholder process. Afterwards the client decided to revise the PDD according to the CAR and CRs indicated in the audit process. The final revision, dated December 09th, 2005 serves as basis of the final assessment presented by this report.

Studying the existing documentation belonging to this project, it was obvious that the competence and capability of the validation team has to cover at least the following aspects:

- Ø Knowledge of Kyoto Protocol and the Marrakesh Accords
- Ø Environmental and Social Impact Assessment
- Ø Skills in environmental auditing (ISO 14000, EMAS)
- Ø Quality assurance

- Ø Technical aspects of cogeneration and the use of biomass
- Ø Monitoring concepts
- Ø Political, economical and technical random conditions in host country

According to these requirements TÜV SÜD has composed a project team in accordance with the appointment rules of the TÜV certification body "climate and energy":

The validation team was consisting of the following two experts:

Markus Knödlseder	(Project manager, GHG lead auditor)
Mauro Fadda	(GHG auditor, local expert)
Javier Castro	(technical expert, GHG trainee)

Markus Knödlseder: After his professional training as chemical assistance Mr. Knödlseder studied environmental engineer at the University of Applied Science in Bingen, Germany. Beside his main focus in studies of environmental technologies, he dealt with environmental management and environmental controlling issues. He has been a staff at the department "Carbon Management Service" located in the head office of TÜV Industrie Service GmbH, TÜV SÜD Group in Munich since Oct. 2001. He has been involved in the topic of environmental auditing, baselining, monitoring and verification due to the requirements of the Kyoto Protocol with special focus on renewable energies. Mr. Knödlseder is also an auditor for environmental management systems (ISO 14.000).

Mr. Mauro Fadda is a quality and environmental management system auditor at ccaQualitas, TÜV SÜD Group. He is familiar with local laws and regulations and the assessment of technical installations as well as with CDM issues. Meanwhile he can refer to the participation in the validation process of more than 15 CDM-projects in Brazil. Thus he is approved as CDM-auditor at the certification body Climate and Energy.

Javier Castro is an energy expert for CDM and JI projects at TÜV Industrie Service GmbH TÜV SÜD Group. He has an academic background in chemical engineering and energy systems. In his position he participates as an expert in energy related projects during the validation, verification and certifications processes for GHG mitigation projects. He has received extensive training in the CDM and JI validation processes.

The audit team covers the above mentioned requirements as follows:

- § Knowledge of Kyoto Protocol and the Marrakesh Accords (All)
- § Environmental and Social Impact Assessment (All)
- § Skills in environmental auditing (All)
- § Quality assurance (All)
- § Technical aspects (All)
- § Monitoring concepts (Knödlseder)
- § Political, economical and technical random conditions in host country (Fadda/Castro)

In order to have an internal quality control of the project, a team of the following persons has been composed by the certification body "climate and energy":

§ Werner Betzenbichler – Head of the Certification Body "Climate and Energy"

1.3 GHG Project Description

This project activity consists of increasing efficiency in the bagasse (a renewable fuel source, residue from sugarcane processing) cogeneration facility of **Sociedad Agrícola e Industrial San Carlos S.A.** an Ecuadorian sugar mill. With the implementation of this project, the mill is able to sell electricity to the national grid, avoiding the dispatch of same amount of energy produced by fossil-fuelled thermal plants to that grid. By that, the initiative avoids CO_2 emissions.

By investing to increase steam efficiency in the sugar and alcohol production and increase in the efficiency of burning the bagasse (more efficient boilers), San Carlos generates surplus steam and uses it exclusively for electricity production (through turbo-generators).

Using Steam-Ranking cycle as the basic technology of its cogeneration system, for achieving an increasing amount of surplus electricity to be generated, San Carlos in mid 2005 implemented this project activity (SCBCP) consisting of the installation of 16 MW and 12 MW backpressure turbo generator and refurbishment of one 220 psi to 600 psi boiler. No turbo-generator was deactivated, reaching a total capacity of 35 MW.

This means increasing renewable energy share in the Ecuadorian matrix.

The project participant in San Carlos Bagasse Cogeneration Project is:

§ Sociedad Agrícola e Industrial San Carlos S.A., an Ecuadorian private company.

2 METHODOLOGY

The project assessment aims at being a risk based approach and is based on the methodology developed in the Validation and Verification Manual (for further information see www.vvmanual.info), an initiative of all Applicant Entities, which aims to harmonize the approach and quality of all such assessments.

In order to ensure transparency, a validation protocol was customised for the project, according to the Validation and Verification Manual. The protocol shows, in a transparent manner, criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

- It organises, details and clarifies the requirements a CDM project is expected to meet;
- It ensures a transparent validation process where the validator will document how a particular requirement has been validated and the result of the validation.

The validation protocol consists of three tables. The different columns in these tables are described in Figure 1. The completed validation protocol is enclosed in Annex 1 to this report.

Validation Protocol Table 1: Mandatory Requirements			
Requirement	***Reference***	***Conclusion***	***Cross reference***
The requirements the project must meet.	*Gives reference to the legislation or agreement where the requirement is found.*	*This is either acceptable based on evidence provided (**OK**), or a **Corrective Action Request (CAR)** of risk or non-compliance with stated requirements. The corrective action requests are numbered and presented to the client in the Validation report.*	*Used to refer to the relevant checklist questions in Table 2 to show how the specific requirement is validated. This is to ensure a transparent Validation process.*

Validation Protocol Table 2: Requirement checklist				
Checklist Question	***Reference***	***Means of verification (MoV)***	***Comment***	***Draft and/or Final Conclusion***
The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organised in seven different sections. Each section is then further subdivided. The lowest level constitutes a checklist question.	*Gives reference to documents where the answer to the checklist question or item is found.*	*Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.*	*The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.*	*This is either acceptable based on evidence provided (**OK**), or a **Corrective Action Request (CAR)** due to non-compliance with the checklist question (See below). **Clarification** is used when the validation team has identified a need for further clarification.*

Validation Protocol Table 3: Resolution of Corrective Action and Clarification Requests			
Draft report clarifications and corrective action requests	***Ref. to checklist question in table 2***	***Summary of project owner response***	***Validation conclusion***
If the conclusions from the draft Validation are either a Corrective Action Request or a Clarification Request, these should be listed in this section.	*Reference to the checklist question number in Table 2 where the Corrective Action Request or Clarification Request is explained.*	*The responses given by the Client or other project participants during the communications with the validation team should be summarised in this section.*	*This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".*

Figure 1 Validation Protocol Tables

2.1 Review of Documents

The project design document submitted by the client and additional background documents related to the project design and baseline were reviewed. A complete list of all documents reviewed is attached as annex 2 to this report.

2.2 Follow-up Interviews

On November 29th- 30th, 2005 TÜV SÜD performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review.

Representatives of:

- Sociedad Agrícola e Industrial San Carlos S.A., Ecuador
- Econergy Brasil Ltda. Sao Paulo, State of Sao Paulo, Brazil

were interviewed. The main topics of the interviews are summarised in Table 1.

Table 1 Interview topics

Interviewed organisation	Interview topics
Sociedad Agrícola e Industrial San Carlos S.A.	§ Project design § Technical equipment § Sustainable development issues § Additionality § Crediting period § Monitoring plan § Management system § Environmental impacts § Local Stakeholder process and Approval by the host country
Econergy Brasil Ltda.	§ Project design § Technical equipment § Sustainable development issues § Baseline determination § Additionality § Crediting period § Monitoring plan § Environmental impacts § Local Stakeholder process

2.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation was to resolve the requests for corrective actions and clarification and any other outstanding issues which needed to be clarified for TÜV SÜD`s positive conclusion on the project design. The Corrective Action Requests and Clarification Requests raised by TÜV SÜD were resolved during communications between the Client and TÜV SÜD. To guarantee the transparency of the validation process, the concerns raised and responses that will be given are summarised in chapter 3 below and documented in more detail in the validation protocol in Annex 1.

3 VALIDATION FINDINGS

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

1) The findings from the desk review of the project design documents and the findings from interviews during the follow up visit are summarised. A more detailed record of these findings can be found in the Validation Protocol in Annex 1.

2) Where TÜV SÜD had identified issues that needed clarification or that represented a risk to the fulfilment of the project objectives, a Clarification or Corrective Action Request, respectively, have been issued. The Clarification and Corrective Action Requests are stated, where applicable, in the following sections and are further documented in the Validation Protocol in Annex 1. The validation of the project resulted in five (5) Corrective Action Requests and nineteen (19) Clarification Requests.

3) Where Clarification or Corrective Action Requests have been issued, the exchanges between the Client and TÜV SÜD to resolve these Clarification or Corrective Action Requests is summarised.

4) The draft final conclusions for validation subject are presented.

The validation findings relate to the project design as documented and described in the final project design documentation.

3.1 Project Design

3.1.1 Discussion

As mentioned above the purpose of the project is to avoid CO_2 emissions from fossil power plants by increasing the efficiency of the existing renewable energy generation. The surplus of electricity being generated by an installed CHP plant is fed into the grid. The whole energy generation is based on renewable biomass, here bagasse from the sugar cane process. Hence, the project contributes to the sustainable development in Ecuador, reducing GHG emissions, substituting electricity generated by grid plants through electricity generated from biomass (renewable energy). The project also contributes to the sustainable development by generating new jobs.

The design engineering does reflect current good practices. The design has been professionally developed. Subsequently the project got approval by the relevant authorities. The project itself does apply state of the art equipment. Regarding the employed technology, there is no requirement to change the existing technology as a result of running out of life-time of the existing technical equipment. There are no significant indications that the technology used to implement the project could be substituted during the envisaged operational lifetime of the project activity (25 years) and in particular in the first crediting period. The first crediting period start 05/07/2005 the length of the first crediting period is seven years with the intention for renewal.

The project is in line with relevant legislation of Ecuador. According to the publicly available document renewable energy projects belongs to the favoured options under the CDM. Hence,

the project can currently be seen as being in line with the host country specific requirements for CDM.

The funding for the project does not lead to a diversion of official development assistance as according to the information obtained by the audit team ODA does not contribute to the financing of the project.

The starting date as well as the operational lifetime are clearly defined and also handled in a reasonable manner to a large extent.

It has been substantiated in detailed (based on facts) that CDM and the possible revenues of CDM already have been known and taken into account in the phase of final deciding to go for the project.

The management system and the responsibilities for the successful realisation of the project have to be explained more detailed.

The written Letter of Approval dated December 23rd, 2005 was submitted to the validation team.

3.1.2 Findings

Outstanding issue:

The project has not obtained a Letter of Approval from the Ecuadorian government. No documentation has been submitted to the validation team. Further It should be clear indicated in the PDD that the project in this stage is a unilateral project.

Response:

Ecuador DNA's informed that San Carlos will receive the Letter of Approval until December 23rd.

Clarification Request No. 1:

The PDD does describe the Facility generally. What is the concrete address of the facility?

Response:

Marcelino Maridueña is a community that has been created due to San Carlos Sugar Mill. Streets have no name and no numbers. Nevertheless the exact UTM location of the project is:

17 H 0673786; UTM 9756066

Clarification Request No. 2:

Detail information about the location of the facility shall be submitted. Furthermore are all equipments in the same location?

Response:

The cogeneration facility is located inside San Carlos facility, as it can be seen on PDD's page 6. All equipments are in the same location.

Clarification Request No. 3:

Information regarding old and new equipment is necessary. Additional information about the re-furbishment shall be submitted to the validation team. That information shall content boilers and turbines and their capacity and efficiency, efficiency and age components and energy process schematic.

Response:

This information was added on PDD's page 9.

Corrective Action Request No.1:

If all the turbo-generator capacity could be used in the future, this issue shall be included in the PDD.

Response:

This information was added on PDD's page 8.

Clarification Request No. 4:

New backpressure turbo-generator and refurbishment of one 220 psi to 600 psi boiler are installed. But there is no Training plan.

Response:

Training was realized by CALDEMA Brazil.

Clarification Request No. 5:

There is no information about licenses and Ecuadorian regulations.

Response:

All documents were submitted to the auditor team.

Clarification Request No. 6:

Actual sustainable development policies of Ecuador shall be given.

Response:

Letter of no Objection was signed by the DNA.

Clarification Request No. 10:

According to CONELEC (2004) are 3.7 GW install and ca. 46% Hydropower. Statement in PDD 3.3 GW and 51.5% Hydropower.

Response:

The requested information was submitted to the validator. For further information see Annex 1.

Clarification Request No. 12:

There is no reference in PPD in relation with relevant national and/or sectoral policies, macro-economic trends and political aspirations.

Response:

Letter of no Objection was signed by the DNA.

3.1.3 Conclusion

The corrective action and clarification requests have been resolved and the project does hence comply with the requirements.

3.2 Baseline and Additionality

3.2.1 Discussion

By dispatching renewable electricity to a grid, electricity that would otherwise be produced using fossil fuel is displaced. This electricity displacement will occur in the system's margin, i.e. this CDM project will displace electricity that is produced by marginal sources - fossil fueled thermal plants - , which have higher electricity dispatching costs and are solicited only over the hours that base load sources (low-cost or must-run sources) cannot supply the grid.

According to the applied and approved methodology AM0015 the project activity follows the steps provided by the methodology taking into account the (b) Simple Adjusted OM calculation for the STEP 1, since there would be no available data for applying to the preferred option – *(c) Dispatch Data Analysis OM.* For STEP 2, the option 1 was chosen.

The physical boundary is the Ecuadorian grid, controlled by CENACE.

Using the "tool for the demonstration and assessment of additionality", issued by UNFCCC October 22nd, 2004, it can be confirmed that the project is additional. The economic unattractiveness of enhancing the already existing cogeneration process is indicating the additionality of this project, because the improved operation of the energy processes is not considered as necessary for the operation of San Carlos. Furthermore there exist relevant political (political crisis in Ecuador), economical (limitation on the credit dedicated to CDM projects), administrative (dubious regulations that demand double work) and technological barriers (missing knowledge and experiences with high-developed technologies in the cogeneration field) to carry out such a project.

3.2.2 Findings

Corrective Action Request No.2:

Methodology ACM006 shall be applied if complete documentation is not submitted before the deadline.

Response:

The documents will be sent before the deadline. So, San Carlos will insist on using Methodology AM0015.

Clarification Request No. 7:

CONELEC, concrete web address from the energy data sources shall be given.

Response:

Information was submitted to the validator.

Clarification Request No. 8:

There is no confirmation that the energy produce in the project will displace the energy produce in Ecuador. Is It possible that it will displace the imported energy from Colombia?

Response:

Imported Colombian energy is considered as low cost/must run, thus being imported before local thermal generation onset, but after local low cost/must run generation. This was the answer given by CORDELIM.

Corrective Action Request No.3:

A financial analysis shall be submitted to the validation team.

Response:

An e-mail sent from Mr. Amalio Puga (Ing. San Carlos) to Mr. Mauro Fadda (TÜV) and Mr. Eduardo Cardoso (Econegy) confirming the IRR with three different prices of CERs is annexed.

Clarification Request No. 14:

Increment of the energy import from Colombia shall be considered in the calculation.

Response:

The energy imported from Colombia was considered, as it can be seen at lambda's factor calculation, where this energy was considered a low-cost / must-run source. The values if imported electricity were added at the energy produced by the hydro power plants of the National Electric System.

Clarification Request No. 15:

Uncertainties with the situation of the "Paute hydropower-plant" (71% of the hydropower) are not considered.

Response:

The situation in Paute is not stable, that means that some months the water level at the reservoir is so low that the electricity production is endangered, what can become a risk to national electricity supply.

Corrective Action Request No.4:

It shall be confirm that data availability for Dispatch Data Analysis is restricted. (CENACE was asked to confirm this issue).

Response:

The confirmation from CENACE will be sent with the final version of the Validation Protocol.

Clarification Request No. 17:

The project owner shall demonstrate if and how much fossil fuel will be used for combustion support.

Response:

Only bagasse has been historically used for sugar production purposes.

3.2.3 Conclusion

The corrective action and clarification requests have been resolved and hence the project does comply with the requirements.

3.3 Monitoring Plan

3.3.1 Discussion

The monitoring plan is appropriate, traceable and transparent to a large extent. The generated electricity that is fed into the grid in order to estimate emissions within the project boundary can be measured simply and with an appropriate accuracy. The CENACE will provide to the project developer the needed data for calculating the combined margin.

As the project is already in operation it can be confirmed that monthly and annual reporting of the collected data at the several monitoring points is working, the responsibilities for registration, monitoring, measurement and reporting are established. But further information concerning the quality management system has to be submitted to the validator.

Uncertainty and possibility of monitoring errors are addressed and discussed plausible in the project documents.

3.3.2 Findings

Corrective Action Request No.5:

The PDD should include missing parameters that has to be monitored according to AM0015. Otherwise the plan shall mention why it is not necessary to monitor these or gives eligible alternatives. Following parameters are missing:

5. $F_{i,j}$ fuel quantity

6. COEFi thermal energy

7. GENj/k/n,,y Electricity quantity

8. Plant name (for OM)

9. Plant name (for BM)

11a. $GEN_{j/k/ll,y}$

11b. $COEF_{i,j,y}$.

Response:

This parameters were included in the revised PDD version.

Clarification Request No. 16:

According to the on-site audit Econergy is in charge of ER calculations, based on generation data (already crosschecked with CONELEC data) emitted by the Laboratory of San Carlos. This issue shall be clearly defined in the PDD.

Response:

This change was added at PDD's Annex 4 – Monitoring Plan.

3.3.3 Conclusion

The clarification and corrective action requests have been fully resolved and the project does hence comply with the requirements.

3.4 Calculation of GHG Emissions

3.4.1 Discussion

The calculation follows the approach of the approved methodology AM0015, using the simple adjusted operational margin in order to calculate the combined margin as a fifty-fifty mix of operational and build margin.

The amount of prospective generated electricity is multiplied with this combined margin in order to calculate the emission reduction in the grid.

The data sources are reliable and the approach of calculating the operational and the build margin is traceable and correct against the background of available data and chosen project boundary.

3.4.2 Findings

Clarification Request No. 9:

According to CONELEC (2004) exist a Company called San Carlos that sale Energy. Is this the same Company?

Response:

Yes. The amount of energy that can be seen in CONELEC web page for 2004 correspond to total generation of San Carlos, since the company was recognized as a generator. According to San Carlos own information, 638 MWh were dispached to the grid, and to CENACE, 651.03 MWh. The difference is due to different reading times.

Clarification Request No. 11:

Calculation of energy to be sold to CONELEC is not transparent. (Capacity available for sale = 16,5, Hours of Operation = 4320 à Energy 71280 MWh, Statement in PDD 56160 MWh).

Response:

The requested information was submitted to the validator. For further information see Annex 1.

Clarification Request No. 13:

The climate factor shall be included in the PDD. The cane season of 2004 produced less bagasse than the average yield of three years before. On the other hand, El Niño phenomenon has reduced yields down to 50% of a normal year.

Response:

The PDD was modified on page 14.

3.4.3 Conclusion

The clarification requests have been fully resolved and the project does hence comply with the requirements.

3.5 Environmental Impacts

3.5.1 Discussion

An Environmental Assessment (EA) has been submitted to the responsible national authorities.

The possible environmental impacts have been analyzed by the Environmental Minitry of Ecuador (Ministerio del Ambiente de Ecuador), who approved the Operation License of SCBCP on September 21rd, 2004. The assessment demonstrated the compliance of the project with all referred environmental legislation in Ecuador.

The relevant background documentation has to be submitted to the validator.

3.5.2 Findings

None

3.5.3 Conclusion

The project does comply with the requirements.

3.6 Comments by Local Stakeholders

3.6.1 Discussion

A local stakeholder process was performed in order to inform about project activity. According to the requirements of the Ecuadorian regulations, the stakeholders were invited to comment the project. But more detailed information concerning this local stakeholder process is required.

3.6.2 Findings

Clarification Request No. 18:

There is no mention of publications in the newspaper, radio or TV for the Stakeholders process.

Response:

The project was announced only via invitations to identified (by San Carlos) stakeholders. Stakeholders were identified within the area of influence of the project. Administration management invited all representatives of the area of influence, including workers organizations of San Carlos and other workers organizations. A meeting with 30 invited persons and 01 CONELEC representative and 01 representative of the Ministry of Environment took place on March 29th, 2004.

Clarification Request No. 19:

Is a Stakeholder consultation required in Ecuador?

Response:

According with the local legislation, a local stakeholder's comments are not necessary. However, San Carlos, aiming to inform the population about the project and its social/ economical/ environmental/ technological benefits invited the public to take part in the presentation of the project in Marcelino Maridueña's municipality on March 29th, 2004.

3.6.3 Conclusion

The clarification requests have been resolved and the project does hence comply with the requirements.

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

TÜV SÜD published the project documents on UNFCCC website and on its own website **(http://www.netinform.net/KE/Wegweiser/Guide2.aspx?ID=1367&Ebene1_ID=26&Ebene2_ID=349&mode=1)**. The PDD was open for commenting in the period from November 11th, 2005 to the December 10th, 2005.

No comments have been received.

5 FINAL VALIDATION OPINION

The Certification Body "Climate and Energy" has been ordered by Sociedad Agrícola e Industrial San Carlos S.A. to perform a validation of the above mentioned project. The validation was performed on the basis of UNFCCC criteria and host country criteria, 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 modalities and procedures and subsequent decisions by the CDM Executive Board.

In summary, it is TÜV SÜD´s opinion that the "San Carlos Bagasse Cogeneration Project (SCBCP)", as described in the revised project design document of December 2005, meets all relevant UNFCCC requirements for the CDM, set by the Kyoto Protocol, the Marrakesh Accords and relevant guidance by the CDM Executive Board and that the project furthermore meets all relevant host country criteria and correctly applies the baseline and monitoring methodology AM0015.

Hence, TÜV SÜD will recommend the SCBCP for registration as CDM project activity by the CDM Executive Board.

By displacing fossil fuel-based electricity in principal with electricity generated from a renewable source, the project results in reductions of CO_{2e} emissions that are real, measurable and give long-term benefits to the mitigation of climate change. An analysis of the investment and various barriers demonstrates that the proposed project activity is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity. Given that the project is implemented as designed, the project is likely to achieve the estimated amount of emission reductions.

Additionally the assessment team reviewed the estimation of the projected emission reductions. We can confirm that the indicated amount of emission reductions of 306 118 tonnes CO_{2e} over a crediting period of seven years, resulting in a calculated annual average of 43 731 tonnes CO_{2e}, represents a reasonable estimation using the assumptions given by the project documents.

The validation is based on the information made available to us and the engagement conditions detailed in this 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, TÜV SÜD 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.

Munich, December 23th, 2005

Werner Betzenbichler

Head certification body "climate and energy"

Munich, December 23th, 2005

Markus Knödlseder

Lead Auditor

Annex 1

Validation Protocol

Table 1 Mandatory Requirements for Clean Development Mechanism (CDM) Project Activities

REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference / Comment
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3	Kyoto Protocol Art.12.2	☑	Table 2, Section E.4.1
2. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof	Kyoto Protocol Art. 12.2, Marrakesh Accords, CDM Modalities §40a	☑	Table 2, Section A.3
3. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC	Kyoto Protocol Art.12.2.	☑	Table 2, Section E.4.1
4. The project shall have the written approval of voluntary participation from the designated national authorities of each party involved	Kyoto Protocol Art. 12.5a, Marrakesh Accords, CDM Modalities §40a	Outstanding issue ☑	The project has not obtained such an approval from Ecuadorian government. No documentation has been submitted to the validation team.
5. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change	Kyoto Protocol Art. 12.5b	☑	Table 2, Section E
6. Reduction in GHG emissions shall be additional to any that would occur in absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity	Kyoto Protocol Art. 12.5c, Marrakesh Accords, CDM Modalities §43	☑	Table 2, Section B.2
7. Potential public funding for the project from Parties in Annex I shall not be a diversion of official development assistance	Marrakech	☑	There is no public funding from

REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference / Comment
	Accords		Parties included in Annex I.
8. Parties participating in the CDM shall designate a national authority for the CDM	Marrakech Accords, CDM Modalities §29	☑	Ecuador has established a designated national authority (DNA) for the CDM.
9. The host country shall be a Party to the Kyoto Protocol	Marrakech Accords, CDM Modalities §30	☑	Ecuador has ratified the Kyoto Protocol on January 13, 2000.
10. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received	Marrakech Accords, CDM Modalities §37b	☑	Table 2, Section G
11. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	Marrakech Accords, CDM Modalities §37c	☑	Table 2, Section F
12. Baseline and monitoring methodology shall be previously approved by the CDM Methodology Panel	Marrakech Accords, CDM Modalities §37e	☑	Table 2, Section B.1.1 and D.1.1
13. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP	Marrakech Accords, CDM Modalities §37f	☑	Table 2, Section D
14. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available	Marrakech Accords, CDM Modalities, §40	☑	A global public stakeholder process on the UNFCCC website take place from 11th November to 10th December, 2005. (See link: http://www.netinform.net/KE/Weg

REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference / Comment
			weiser/Guide2.aspx?ID=1367&Ebene1_ID=26&Ebene2_ID=349&mode=0)
15. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances	Marrakech Accords, CDM Modalities, §45c,d	☑	Table 2, Section B.2
16. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure	Marrakech Accords, CDM Modalities, §47	☑	Table 2, Section B.2
17. The project design document shall be in conformance with the UNFCCC CDM-PDD format	Marrakech Accords, CDM Modalities, Appendix B, EB Decisions	☑	The PDD is in conformance with the CDM Project Design Document (version 02).

Table 2 Requirements Checklist

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
A. General Description of Project Activity *The project design is assessed.*					
A.1. Project Boundaries *Project Boundaries are the limits and borders defining the GHG emission reduction project.*					
A.1.1. Are the project's spatial (geographical) boundaries clearly defined?	1-3, 17, 18	DR	The location of the project is mentioned. **Clarification Request No. 1:** What is the concrete address of the facility?	**CR1**	☑
A.1.2. Are the project's system (components and facilities used to mitigate GHGs) boundaries clearly defined?	1-3, 8-10, 12, 13, 17-19	DR	No: The boundary of the location of the facilities is mentioned. **Clarification Request No. 2:** Where is the cogeneration facility located? Are all equipments in the same location? **Clarification Request No. 3:** Information regarding old and new equipment is necessary. Additional information about the refurbishment shall be submitted to the validation team. That information shall content boilers and turbines and their capacity and efficiency, efficiency and age components and energy process schematic.	**CR2** **CR3** **CAR 1**	☑

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
			Corrective Action Request No1: If all the turbo-generator capacity could be used in the future, this issue shall be included in the PDD.		
A.2. Technology to be employed *Validation of project technology focuses on the project engineering, choice of technology and competence/ maintenance needs. The validator should ensure that environmentally safe and sound technology and know-how is used.*					
A.2.1. Does the project design engineering reflect current good practices?	1-3, 5, 8, 25	DR	That can not be validated sufficiently: See above CR 3.	**See CR 3**	☑
A.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?	1-3, 8-10, 19, 25, 32, 33	DR	That can not be validated sufficiently: See above CR 3.	**See CR 3**	☑
A.2.3. Is the project technology likely to be substituted by other or more efficient technologies within the project period?	1-3, 8-10, 19, 25, 32, 33	DR	That can not be validated sufficiently: See above CR 3.	**See CR 3**	☑
A.2.4. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period?	1-3, 8-10, 19, 25, 29, 32, 33	DR	Yes, initial training and maintenance efforts are required. **Clarification Request No. 4:** New backpressure turbo-generator and refurbishment of one 220 psi to 600 psi boiler are installed. But there is no Training	**CR4**	☑

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
			plan.		
A.2.5. Does the project make provisions for meeting training and maintenance needs?	1-3, 8-10, 19, 25, 29, 32, 33	DR	See comment above.	**CR 4**	☑
A.3. Contribution to Sustainable Development *The project's contribution to sustainable development is assessed.*					
A.3.1. Is the project in line with relevant legislation and plans in the host country?	1-5, 8, 13-19 ,35	DR	Yes, It is mention that the project is generally in line with the relevant legislation in the host country. **Clarification Request No. 5:** There is no information about licenses and Ecuadorian regulations	**CR5**	☑
A.3.2. Is the project in line with host-country specific CDM requirements?	1-5, 8, 13-19 ,35	DR	Ecuador has so far not published any specific CDM requirements.	☑	☑
A.3.3. Is the project in line with sustainable development policies of the host country?	1-5, 8, 13-19 ,35	DR	Yes. But there is not actual information available. **Clarification Request No. 6:** Actual sustainable development policies of Ecuador shall be given	**CR6**	☑
A.3.4. Will the project create other environmental or social benefits than GHG emission reductions?	1-5, 8, 13-19, 21 ,35	DR	Yes. The Industry realized Social and Environmental contribution.	☑	☑

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
B. Project Baseline *The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.*					
B.1. Baseline Methodology *It is assessed whether the project applies an appropriate baseline methodology.*					
B.1.1. Is the baseline methodology previously approved by the CDM Methodology Panel?	1-3, 31	DR	Yes, but AM0015 was replace by ACM006. **Corrective Action Request No2:** Methodology ACM006 shall be applied if complete documentation is not submitted before the deadline.	**CAR2**	☑
B.1.2. Is the baseline methodology the one deemed most applicable for this project and is the appropriateness justified?	1-3, 8-10,13, 31	DR	Yes, the methodology is applicable to this project	☑	☑
B.2. Baseline Determination *The choice of baseline will be validated with focus on whether the baseline is a likely scenario, whether the project itself is not a likely baseline scenario, and whether the baseline is complete and transparent.*					
B.2.1. Is the application of the methodology and the discussion and determination of the chosen baseline transparent?	1-4, 30-33	DR	Yes, as far the Project developer clarify the Information source. **Clarification Request No. 7:** CONELEC, concrete web address from the	**CR7** **CR8** **CR9**	☑

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
			sources shall be given. **Clarification Request No. 8:** There is no confirmation that the energy produce in the project will displace the energy produce in Ecuador. Is It possible that it will displace the imported energy from Colombia? **Clarification Request No. 9:** According to CONELEC (2004) exist a Company called San Carlos that sale Energy. Is this the same Company? **Clarification Request No. 10:** According to CONELEC (2004) are 3.7 GW install and ca. 46% Hydropower. Statement in PDD 3.3 GW and 51.5% Hydropower. **Clarification Request No. 11:** Calculation of energy to be sold to CONELEC is not transparent. (Capacity available for sale = 16,5, Hours of Operation = 4320 → Energy 71280 MWh, Statement in PDD 56160 MWh)	**CR10** **CR11**	
B.2.2. Has the baseline been determined using conservative assumptions where possible?	1-4, 30-33	DR	Yes. The emission factor is calculated in the most conservative way.	☑	☑
B.2.3. Has the baseline been established on a project-specific basis?	1-4, 30-33	DR	Yes.	☑	☑
B.2.4. Does the baseline scenario sufficiently take	1-4, 8,	DR	Can not be validated sufficiently.	**CR12**	☑

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	21-23, 30-33		**Clarification Request No. 12:** There is no reference in the PDD in relation with this thematic.		
B.2.5. Is the baseline determination compatible with the available data?	1-4, 8, 21-23, 30-33	DR	Can not be validated sufficiently. See comment B.2.1	**Open**	☑
B.2.6. Does the selected baseline represent the most likely scenario among other possible and/or discussed scenarios?	1-4, 8, 21-23, 30-33	DR	Yes.	☑	☑
B.2.7. Is it demonstrated/justified that the project activity itself is not a likely baseline scenario (e.g. through (a) a flow-chart or series of questions that lead to a narrowing of potential baseline options, (b) a qualitative or quantitative assessment of different potential options and an indication of why the non-project option is more likely, (c) a qualitative or quantitative assessment of one or more barriers facing the proposed project activity or (d) an indication that the project type is not common practice in the proposed area of implementation, and not required by a Party's legislation/regulations)?	1-4, 8, 21-23, 30-33	DR	Yes, the barriers are clearly identified. During the on-site Audit one additional barrier was identified. **Clarification Request No. 13:** The climate factor shall be included in the PDD. The cane season of 2004 produced less bagasse than the average yield of three years before. On the other hand, El Niño phaenomenon has reduced yields down to 50% of a normal year. **Corrective Action Request No3:** A financial analysis shall be submitted to the validator team.	**CR 13** **CAR 3**	☑
B.2.8. Have the major risks to the baseline been identified?	1-4, 8, 21-23, 30-33	DR	There is no analysis about the increment of the energy import from Colombia. **Clarification Request No. 14:**	**CR14** **CR15**	☑

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
			Increment of the energy import from Colombia shall be considered in the calculation. **Clarification Request No. 15:** Uncertainties with the situation of the "Paute hydropower-plant" (71% of the hydropower) are not considered.		
B.2.9. Is all literature and sources clearly referenced?	1-4, 8, 21-23, 30-33	DR	No. See CR7. **Corrective Action Request No4:** It shall be confirm that data availability for Dispatch Data Analysis is restricted.	**CAR 4** **See** **CR7**	☑
C. Duration of the Project/ Crediting Period *It is assessed whether the temporary boundaries of the project are clearly defined.*					
C.1.1. Are the project's starting date and operational lifetime clearly defined and reasonable?	1-4, 6-10, 12-23	DR	Project is already installed. See CR3. There is no enough information about the equipment	**CR3**	☑
C.1.2. 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)?	1-4, 6-10, 12-23	DR	Can not be validated sufficiently. See CR3. There is no enough information about the equipment	**CR3**	☑

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
D. Monitoring Plan *The monitoring plan review aims to establish whether all relevant project aspects deemed necessary to monitor and report reliable emission reductions are properly addressed ((Blue text contains requirements to be assessed for optional review of monitoring methodology prior to submission and approval by CDM EB).*					
D.1. Monitoring Methodology *It is assessed whether the project applies an appropriate baseline methodology.*					
D.1.1. Is the monitoring methodology previously approved by the CDM Methodology Panel?	1-3, 31	DR	Yes, but see CAR 2	**CAR2**	☑
D.1.2. Is the monitoring methodology applicable for this project and is the appropriateness justified?	1-3, 5, 20, 31	DR	Yes	☑	☑
D.1.3. Does the monitoring methodology reflect good monitoring and reporting practices?	1-3, 5, 20, 31	DR	Yes	☑	☑
D.1.4. Is the discussion and selection of the monitoring methodology transparent?	1-3, 5, 20, 31	DR	Yes	☑	☑
D.2. Monitoring of Project Emissions *It is established whether the monitoring plan provides for reliable and complete project emission data over time.*					
D.2.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project	1-3, 5, 20, 31	DR	The project itself does not emit any GHG, hence no monitoring is applicable according to AM0015.	☑	☑

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
boundary during the crediting period?					
D.2.2. Are the choices of project GHG indicators reasonable?	1-3, 5, 20, 31	DR	Yes the indicators are given by AM0015.	☑	☑
D.2.3. Will it be possible to monitor / measure the specified project GHG indicators?	1-3, 5, 20, 31	DR	Yes	☑	☑
D.2.4. Will the indicators give opportunity for real measurements of achieved emission reductions?	1-3, 5, 20, 31	DR	Not directly, it is in the nature of AM0015 that achieved emission reduction can be calculated only.	☑	☑
D.2.5. Will the indicators enable comparison of project data and performance over time?	1-3, 5, 20, 31	DR	Yes	☑	☑
D.3. Monitoring of Leakage *It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.*					
D.3.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	1-3, 5, 20, 31	DR	It has been demonstrated in a plausible manner that leakage emissions are not expected to occur in a different manner between both scenarios.	☑	☑
D.3.2. Have relevant indicators for GHG leakage been included?	1-3, 5, 20, 31	DR	See comment D.3.1	☑	☑
D.3.3. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	1-3, 5, 20, 31	DR	See comment D.3.1	☑	☑
D.3.4. Will it be possible to monitor the specified GHG leakage indicators?	1-3, 5, 20, 31	DR	See comment D.3.1	☑	☑

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
D.4. Monitoring of Baseline Emissions *It is established whether the monitoring plan provides for reliable and complete project emission data over time.*					
D.4.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	1-3, 5, 20, 31	DR	The monitoring plan provides all relevant data necessary for estimation the green-house emissions in the project. But for determining the GHG reduction data from the electricity grid has to be measured. According to AM0015 not all necessary parameters will be monitored. **Corrective Action Request No5:** The PDD should include missing parame-ters that has to be monitored according to AM0015. Otherwise the plan shall mention why it is not necessary to monitor these or gives eligible alternatives. Following parameters are missing: 5. $F_{i,j}$ fuel quantity 6. COEFi thermal energy 7. GENj/k/n,,y Electricity quantity 8. Plant name (for OM) 9. Plant name (for BM) 11a. $GEN_{j/k/ll,y}$ 11b. $COEF_{i,j,y}$	**CAR5**	☑

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
D.4.2. Is the choice of baseline indicators, in particular for baseline emissions, reasonable?	1-3, 5, 20, 31	DR	If all parameters according to AM0015 will be monitored, the indicators are reasonable. See CAR 5	**CAR 5**	☑
D.4.3. Will it be possible to monitor the specified baseline indicators?	1-3, 5, 20, 31	DR	Yes	☑	☑
D.5. Monitoring of Sustainable Development Indicators/ Environmental Impacts *It is checked that choices of indicators are reasonable and complete to monitor sustainable performance over time.*					
D.5.1. Does the monitoring plan provide the collection and archiving of relevant data concerning environmental, social and economic impacts?	1-3, 5, 20, 31	DR	No, as a monitoring of such data is not required by the applied monitoring methodology.	☑	☑
D.5.2. Is the choice of indicators for sustainability development (social, environmental, economic) reasonable?	1-3, 5, 20, 31	DR	See comment A.3.3.	**CR6**	☑
D.5.3. Will it be possible to monitor the specified sustainable development indicators?	1-3, 5, 20, 31	DR	See comment A.3.3.	**CR6**	☑
D.5.4. Are the sustainable development indicators in line with stated national priorities in the Host Country?	1-3, 5, 20, 31	DR	See comment A.3.3.	**CR6**	☑
D.6. Project Management Planning *It is checked that project implementation is properly prepared for and that critical arrangements are addressed.*					
D.6.1. Is the authority and responsibility of project	1-3, 5,	DR	Yes the PDD does clearly indicate the	**CR 16**	☑

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
management clearly described?	8, 20-25		authority and responsibilities within the given project structure. Nevertheless data management for ER calculations shall be clearly defined. **Clarification Request No. 16:** According to the on-site audit Econergy is in charge of ER calculations, based on generation data (already crosschecked with CONELEC data) emitted by the Laboratory of San Carlos. This issue shall be clearly defined in the PDD. **Recommendation:** A time schedule shall be submitted to the validator team.		
D.6.2. Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described?	1-3, 5, 8, 20-25	DR	See comment D.6.1	**CR 16**	☑
D.6.3. Are procedures identified for training of monitoring personnel?	1-3, 5, 8, 20-25	DR	See comment A.2.4	**CR4**	☑
D.6.4. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	1-3, 5, 8, 20-25	DR	There are no emergency plans available. From the point of the validation that is not a major discrepancy to relevant CDM requirements. **Recommendation:** The project participants shall establish procedures for emergency preparedness for cases where emergencies can cause	☑	☑

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
			unintended emissions. A missing of such procedures might endanger the verification.		
D.6.5. Are procedures identified for calibration of monitoring equipment?	1-3, 5, 8, 20-25	DR	No, procedures for calibration of monitoring equipment are not described in the PDD **Recommendation:** The project participants shall establish procedures for calibration of monitoring equipment. A missing of such procedures might endanger the verification.	☑	☑
D.6.6. Are procedures identified for maintenance of monitoring equipment and installations?	1-3, 5, 8, 20-25	DR	No, procedures for maintenance of monitoring equipment are not described in the PDD **Recommendation:** The project participants shall establish procedures for maintenance of monitoring equipment. A missing of such procedures might endanger the verification.	☑	☑
D.6.7. Are procedures identified for monitoring, measurements and reporting?	1-3, 5, 8, 20-25	DR	See comment D.6.1	**CR 16**	☑
D.6.8. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	1-3, 5, 8, 20-25	DR	See comment D.6.1	**CR 16**	☑
D.6.9. Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	1-3, 5, 8, 20-25	DR	See comment D.6.1	**CR 16**	☑

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
D.6.10. Are procedures identified for review of reported results/data?	1-3, 5, 8, 20-25	DR	See comment D.6.1	**CR 16**	☑
D.6.11. Are procedures identified for internal audits of GHG project compliance with operational requirements where applicable?	1-3, 5, 8, 20-25	DR	There are no procedures identified for internal audits of GHG project compliance with operational requirements where applicable. From the point of the validation that is not a major discrepancy to relevant CDM requirements. **Recommendation:** The project participants shall establish procedures for internal audits of GHG project compliance with operational requirements where applicable. A missing of such procedures might endanger the verification.	**Open**	☑
D.6.12. Are procedures identified for project performance reviews before data is submitted for verification, internally or externally?	1-3, 5, 8, 20-25	DR	See comment D.6.1	**CR 16**	☑
D.6.13. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	1-3, 5, 8, 20-25	DR	There are no procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting. From the point of the validation that is not a major discrepancy to relevant CDM requirements. **Recommendation:** The project participants shall establish	☑	☑

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
			procedures for corrective actions in order to provide for more accurate future monitoring and reporting. A missing of such procedures might endanger the verification.		
E. Calculation of GHG Emissions by Source *It is assessed whether all material GHG emission sources are addressed and how sensitivities and data uncertainties have been addressed to arrive at conservative estimates of projected emission reductions.*					
E.1. Predicted Project GHG Emissions *The validation of predicted project GHG emissions focuses on transparency and completeness of calculations.*					
E.1.1. Are all aspects related to direct and indirect GHG emissions captured in the project design?	1-4, 8, 21-23, 30-33	DR	The project itself will not create GHG emissions – in usually case. **Clarification Request No. 17:** However, the project owner shall demonstrate if and how much fossil fuel will be used for combustion support.	**CR17**	☑
E.1.2. Are the GHG calculations documented in a complete and transparent manner?	1-4, 8, 21-23, 30-33	DR	See comment E.1.1.	☑	☑
E.1.3. Have conservative assumptions been used to calculate project GHG emissions?	1-4, 8, 21-23, 30-33	DR	See comment E.1.1.	☑	☑
E.1.4. Are uncertainties in the GHG emissions estimates properly addressed in the	1-4, 8, 21-23,	DR	See comment E.1.1.	☑	☑

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
documentation?	30-33				
E.1.5. Have all relevant greenhouse gases and source categories listed in Kyoto Protocol Annex A been evaluated?	1-4, 8, 21-23, 30-33	DR	See comment E.1.1.	☑	☑
E.2. Leakage *It is assessed whether there leakage effects, i.e. change of emissions which occurs outside the project boundary and which are measurable and attributable to the project, have been properly assessed.*					
E.2.1. Are potential leakage effects beyond the chosen project boundaries properly identified?	1-4, 8, 21-23, 30-33	DR	See comment D.3.1	☑	☑
E.2.2. Have these leakage effects been properly accounted for in calculations?	1-4, 8, 21-23, 30-33	DR	See comment D.3.1	☑	☑
E.2.3. Does the methodology for calculating leakage comply with existing good practice?	1-4, 8, 21-23, 30-33	DR	See comment D.3.1	☑	☑
E.2.4. Are the calculations documented in a complete and transparent manner?	1-4, 8, 21-23, 30-33	DR	See comment D.3.1	☑	☑
E.2.5. Have conservative assumptions been used when calculating leakage?	1-4, 8, 21-23, 30-33	DR	See comment D.3.1	☑	☑
E.2.6. Are uncertainties in the leakage estimates properly addressed?	1-4, 8, 21-23,	DR	See comment D.3.1	☑	☑

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
	30-33				
E.3. Baseline Emissions *The validation of predicted baseline GHG emissions focuses on transparency and completeness of calculations.*					
E.3.1. Have the most relevant and likely operational characteristics and baseline indicators been chosen as reference for baseline emissions?	1-4, 8, 21-23, 30-33	DR	Yes, the indicators follow AM0015.	☑	☑
E.3.2. Are the baseline boundaries clearly defined and do they sufficiently cover sources and sinks for baseline emissions?	1-4, 8, 21-23, 30-33	DR	See comment B.2.8.	**CR 14** **CR 15**	☑
E.3.3. Are the GHG calculations documented in a complete and transparent manner?	1-4, 8, 21-23, 30-33	DR	Yes	☑	☑
E.3.4. Have conservative assumptions been used when calculating baseline emissions?	1-4, 8, 21-23, 30-33	DR	See comment B.2.8.	**CR 14** **CR 15**	☑
E.3.5. Are uncertainties in the GHG emission estimates properly addressed in the documentation?	1-4, 8, 21-23, 30-33	DR	See comment B.2.8.	**CR 14** **CR 15**	☑
E.3.6. Have the project baseline(s) and the project emissions been determined using the same appropriate methodology and conservative assumptions?	1-4, 8, 21-23, 30-33	DR	See comment B.2.8.	**CR 14** **CR 15**	☑

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
E.4. Emission Reductions Validation of baseline GHG emissions will focus on methodology transparency and completeness in emission estimations.					
E.4.1. Will the project result in fewer GHG emissions than the baseline scenario?	1-4, 8, 21-23, 30-33	DR	Yes. See comment B.2.8.	**CR 14** **CR 15**	☑
F. Environmental Impacts *Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.*					
F.1.1. Has an analysis of the environmental impacts of the project activity been sufficiently described?	1-3, 5, 13-16, 18	DR	Yes, the environmental impacts were analyzed by the Environment Ministry of Ecuador.	☑	☑
F.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	1-3, 5, 13-16, 18	DR	See comment above	☑	☑
F.1.3. Will the project create any adverse environmental effects?	1-3, 5, 13-16, 18	DR	No, negative environmental effects are not expected to be created by the project.	☑	☑
F.1.4. Are transboundary environmental impacts considered in the analysis?	1-3, 5, 13-16, 18	DR	No. Changes in the import form Colombia is not analyse. See CR14	**CR14**	☑
F.1.5. Have identified environmental impacts been addressed in the project design?	1-3, 5, 13-16, 18	DR	See comment F.1.1	☑	☑

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
F.1.6. Does the project comply with environmental legislation in the host country?	1-3, 5, 13-16, 18	DR	See comment F.1.1	☑	☑
G. Stakeholder Comments *The validator should ensure that a stakeholder comments have been invited and that due account has been taken of any comments received.*					
G.1.1. Have relevant stakeholders been consulted?	1-3, 11	DR	Yes, the stakeholders included people from the government, Red Cross, civil council, sugarcane workers` association were invited to the presentation of the project.	☑	☑
G.1.2. Have appropriate media been used to invite comments by local stakeholders?	1-3, 11	DR	**Clarification Request No. 18:** There is no mention of publications in the newspaper, radio or TV.	**CR18**	☑
G.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	1-3, 11	DR	No mention. **Clarification Request No. 19:** Is a Stakeholder consultation required in Ecuador?	**CR19**	☑
G.1.4. Is a summary of the stakeholder comments received provided?	1-3, 11	DR	Yes.	☑	☑
G.1.5. Has due account been taken of any stakeholder comments received?	1-3, 11	DR	Yes.	☑	☑

Table 3 Resolution of Corrective Action and Clarification Requests

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
Acc. to Kyoto Protocol and Marrakesh Accords the project shall have the written approval of voluntary participation from the designated national authorities of each party involved. **Outstanding issue:** The project has not obtained such an approval from Ecuadorian government. No documentation has been submitted to the validation team. Further It should be clear indicated in the PDD that the project in this stage is a unilateral project.	**Table 1, 4.**	Ecuador DNA's informed that San Carlos will receive the Letter of Approval until December 23rd.	☑
Clarification Request No. 1: The PDD does describe the Facility generally. What is the concrete address of the facility?	**A.1.1**	Marcelino Maridueña is a community that has been created due to San Carlos Sugar Mill. Streets have no name and no numbers. Nevertheless the exact UTM location of the project is: 17 H 0673786 UTM 9756066	☑
Clarification Request No. 2: Detail information about the location of the	**A.1.2.**	The cogeneration facility is located inside San Carlos facility, as it can be	☑

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
facility shall be submitted. Furthermore are all equipments in the same location?		seen on PDD's page 6. All equipments are in the same location.	
Clarification Request No. 3: Information regarding old and new equipment is necessary. Additional information about the refurbishment shall be submitted to the validation team. That information shall content boilers and turbines and their capacity and efficiency, efficiency and age components and energy process schematic.	**A.1.2.** **A.2.1.** **A.2.2.** **A.2.3.** **C.1.1.** **C.1.2.**	This information was added on PDD's page 9.	☑
Corrective Action Request No1: If all the turbo-generator capacity could be used in the future, this issue shall be included in the PDD.	**A.2.1.**	This information was added on PDD's page 8.	☑
Clarification Request No. 4: New backpressure turbo-generator and refurbishment of one 220 psi to 600 psi boiler are installed. But there is no Training plan.	**A.2.4.** **A.2.5.** **D.6.3.**	Training was realized by CALDEMA Brazil.	☑
Clarification Request No. 5: There is no information about licenses and Ecuadorian regulations	**A.3.1.**	All documents were submitted to the auditor team.	☑
Clarification Request No. 6: Actual sustainable development policies of Ecuador shall be given	**A.3.3.** **D.5.2.** **D.5.3.**	Letter of no Objection was signed by the DNA.	☑

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
	D.5.4.		
Corrective Action Request No2: Methodology ACM006 shall be applied if complete documentation is not submitted before the deadline.	**B.1.1.** **D.1.1.**	The documents will be sent before the deadline. So, San Carlos will insist on using Methodology AM0015.	☑
Clarification Request No. 7: CONELEC, concrete web address from the sources shall be given.	**B.2.1.** **B.2.5.** **B.2.9.**	Information was submitted to the validation team.	☑
Clarification Request No. 8: There is no confirmation that the energy produce in the project will displace the energy produce in Ecuador. Is It possible that it will displace the imported energy from Colombia?	**B.2.1.** **B.2.5.**	Imported Colombian energy is considered as low cost/must run, thus being imported before local thermal generation onset, but after local low cost/must run generation. This was the answer given by CORDELIM.	☑
Clarification Request No. 9: According to CONELEC (2004) exist a Company called San Carlos that sale Energy. Is this the same Company?	**B.2.1.** **B.2.5.**	Yes. The amount of energy that can be seen in CONELEC web page for 2004 correspond to total generation of San Carlos, since the company was recognized as a generator. According to San Carlos own information, 638 MWh were dispached to the grid, and to CENACE, 651.03 MWh. The difference is due to different reading times.	☑
Clarification Request No. 10: According to CONELEC (2004) are 3.7 GW install and ca. 46% Hydropower. Statement in PDD 3.3 GW and 51.5% Hydropower.	**B.2.1.** **B.2.5.**	According to the 2004 Statistical Bulletin, published by CONELEC at www.conelec.gov.ec, in Dec/2004, without considering the power imported	☑

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		from Colombia, Ecuador had a nominal generation capacity of 3.520 MW, with an effective power of 3.331 MW. The total effective power corresponds to: - Hydro: 1.732,69 MW (52,02%); - Gas Plants: 575,50 MW (17,28%); - Natural Gas Plants: 160,87 MW (4,83%); - ICE (Internal Combustion Engines) Plants: 419,56 MW (12,60%); and - Steam plants: 442 MW (13,27%). The "Boletines Estadísticos del CONELEC" are annual official publications, where the main operational characteristics of the Ecuadorian electric system are presented.	
Clarification Request No. 11: Calculation of energy to be sold to CONELEC is not transparent. (Capacity available for sale = 16,5, Hours of Operation = 4320 → Energy 71280 MWh, Statement in PDD 56160 MWh)	**B.2.1.** **B.2.5.**	The calculation was lower than the available capacity because the turbo generators doesn't operate during the whole harvest season, due to: - Leak of bagasse; - The condensing turbo-generator (TG 16 MW) operates during more time	☑

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		sending steam to the mill than producing electricity;	
Clarification Request No. 12: There is no reference in PPD in relation with relevant national and/or sectoral policies, macro-economic trends and political aspirations	**B.2.4.**	Letter of no Objection was signed by the DNA.	☑
Clarification Request No. 13: The climate factor shall be included in the PDD. The cane season of 2004 produced less bagasse than the average yield of three years before. On the other hand, El Niño phenomenon has reduced yields down to 50% of a normal year.	**B.2.7.**	The PDD was modified on page 14.	☑
Corrective Action Request No3: A financial analysis shall be submitted to the validator team.	**B.2.7.**	An e-mail sent from Mr. Amalio Puga (Ing. San Carlos) to Mr. Mauro Fadda (TÜV) and Mr. Eduardo Cardoso (Econegy) confirming the IRR with three different prices of CERs is annexed.	☑
Clarification Request No. 14: Increment of the energy import from Colombia shall be considered in the calculation.	**B.2.8.** **E.3.2.** **E.3.4.** **E.3.5.** **E.3.6.** **E.4.1.**	The energy imported from Colombia was considered, as it can be seen at lambda's factor calculation, where this energy was considered a low-cost / must-run source. The values if imported electricity were added at the energy produced by the hydro power plants of	☑

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
	F.1.4.	the National Electric System.	
Clarification Request No. 15: Uncertainties with the situation of the "Paute hydropower-plant" (71% of the hydropower) are not considered.	**B.2.8.** **E.3.2.** **E.3.4.** **E.3.5.** **E.3.6.** **E.4.1.**	The situation in Paute is not stable, that means that some months the water level at the reservoir is so low that the electricity production is endangered, what can become a risk to national electricity supply.	☑
Corrective Action Request No4: It shall be confirmed that data availability for Dispatch Data Analysis is restricted. (CENACE was asked to confirm this issue).	**B.2.9.**	The confirmation from CENACE will be sent with the final version of the Validation Protocol.	☑
Corrective Action Request No5: The PDD should include missing parameters that has to be monitored according to AM0015. Otherwise the plan shall mention why it is not necessary to monitor these or gives eligible alternatives. Following parameters are missing: 5. $F_{i,j}$ fuel quantity 6. COEFi thermal energy 7. GENj/k/n,,y Electricity quantity 8. Plant name (for OM) 9. Plant name (for BM) 11a. $GEN_{j/k/ll,y}$ 11b. $COEF_{i,j,y}$	**D.4.1.**	This parameters were included at: - PDD's Item B.2 table, pages 11 and 12; - PDD's item D.2.1.3, pages 19 and 20; and - PDD's item D.3, page 22.	☑

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
Clarification Request No. 16: According to the on-site audit Econergy is in charge of ER calculations, based on generation data (already crosschecked with CONELEC data) emitted by the Laboratory of San Carlos. This issue shall be clearly defined in the PDD.	**D.6.1.**	This change was added at PDD's Annex 4 – Monitoring Plan.	☑
Clarification Request No. 17: However, the project owner shall demonstrate if and how much fossil fuel will be used for combustion support.	**E.1.1.** **E.1.2.** **E.1.3.** **E.1.4.** **E.1.5.**	Only bagasse has been historically used for sugar production purposes.	☑
Clarification Request No. 18: There is no mention of publications in the newspaper, radio or TV for the Stakeholders process.	**G.1.2.**	The project was announced only via invitations to identified (by San Carlos) stakeholders. Stakeholders were identified within the area of influence of the project. Administration management invited all representatives of the area of influence, including workers organizations of San Carlos and other workers organizations. A meeting with 30 invited persons and 01 CONELEC representative and 01 representative of the Ministry of Environment took place on march 29, 2004.	☑
Clarification Request No. 19: Is a Stakeholder consultation required in	**G.1.3.**	According with the local legislation, a local stakeholder's comments are not	☑

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
Ecuador?		necessary. However, San Carlos, aiming to inform the population about the project and its social/ economical/ environmental/ technological benefits invited the public to take part in the presentation of the project in Marcelino Maridueña's municipality on March 29th, 2004.	

Annex 2

Information Reference List

Reference No.	Document or Type of Information
1	On-site interviews at Ingenio San Carlos with the project developer and the representatives of San Carlos on November 29 – 30, 2005 by auditing team of TÜV SÜD **Validation team on-site:** Mauro Fadda — cca Qualitas, TÜV SÜD Group **Interviewed persons:** Eduardo Cardoso — Project Engeneer Econergy, Brasil Amalio Puga — QMS & Environment Manager, San Carlos Angel Zurita — Finance Manager, San Carlos Roberto Rodriguez — Assistant of Operation Superintendent, San Carlos Manuel Aguilar — Plant Superintendent, San Carlos
2	Project Design Document "San Carlos Bagasse Cogeneration Project (SCBCP)", Econergy Brasil Ltda., November 2005
3	Project Design Document "San Carlos Bagasse Cogeneration Project (SCBCP)", Econergy Brasil Ltda., December, 2005
4	Regulation 003/02, Prices for Energy that is generated by non conventional renewable resources in Ecuador, March 2002
5	QMS Certificate, ISO 9001 Certificate, August 2002
6	Extract of report on visit to Brasil, May 2003
7	Memorandum from the companies president to finance manager in order to consider CDM revenues for the project 17th July, 2003
8	San Carlos News Bulletin, Jan-Jun, 2004
9	TG3, TG4 and steam generation plant installation and construction contract, 4th March, 2004
10	Contract for Boiler Refurbishment, 15th March, 2004
11	Public Consultation Act, 29th March, 2004
12	Approval for preliminary works for enlargement of auto generation facilities (CONELEC), 11th May, 2004
13	Permission Certificate CONELEC, 25th June, 2004
14	Letter of No Objection, DNA, 17th September 2004
15	Environmental License, Ministry of Environment, 23rd September, 2004
16	EIA Approval, Ministry of Environment, 23rd September, 2004
17	Contract between CONELEC and San Carlos, 11th November, 2004

Reference No.	Document or Type of Information
18	Letter of No Objection, Milagro C.A. Transmission company, 8th December, 2004
19	Verification Acts, CENACE, Dec. 2004 - Jul. 2005
20	Maintenance Program, Jan-Jun, 2005
21	San Carlos Social Balance Report 2004
22	San Carlos Periodic Production Reports
23	San Carlos Daily Production Reports
24	Head of Environmental Monitoring Report, August 2005
25	QMS – Procedure, August 2005
26	BVQI Recertification Audit Report, September 2005
27	Exported Energy, Jul.- Nov. -2005
28	Environmental Management Plan
29	Certificate of Training, November 2005
30	Evidence of Low Cost category of imported Colombian energy, 29th November, 2005
31	Approved baseline methodology AM0015: Bagasse-based cogeneration connected to an electricity grid. UNFCCC, 2004
32	IPCC: 2000, Good Practice Guidance
33	UNFCCC, CDM: Tool for the demonstration and assessment of additionality” approved by the EB (EB 16, annex 1).
34	Validation and Verification Manual, IETA/World Bank (PCF), http://www.vvmanual.info
35	Letter of approval, DNA Ecuador, December, 2005
36	CENACE confirmation of restricted availability for DDA, December , 2005