



VALIDATION REPORT

LAZARO ENERGY EFFICIENCY PROJECT IN MEXICO

REPORT No. 2006-0092

REVISION No. 01

DET NORSKE VERITAS



VALIDATION REPORT

Date of first issue: 2006-03-09	Project No.: 45010007
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Summary:

Det Norske Veritas Certification Ltd. (DNV) has performed a validation of the "Lazaro Energy Efficiency Project" in Mexico on the basis of 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 modalities and procedures, the simplified modalities and procedures for small-scale CDM project activities and the subsequent decisions by the CDM Executive Board. This validation report summarizes the findings of the validation.

The validation consists of the following three phases: i) a desk review of the project design, baseline and monitoring plan, ii) follow-up interviews with project stakeholders and iii) the resolution of outstanding issues and the issuance of the final validation report and opinion.

In summary, it is DNV's opinion that the project, as described in the project design document of 13 March 2006, meets all relevant UNFCCC requirements for the CDM and correctly applies the approved simplified baseline and monitoring methodology AMS-II.D. Hence, DNV requests the registration of the "Lazaro Energy Efficiency Project" project in Mexico as CDM project activity.

Report No.: 2006-0092	Subject Group: Environment
Report title: Lazaro Energy Efficiency Project in Mexico	
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Date of this revision: 2006-03-13	Rev. No.: 01
Number of pages: 9	

Indexing terms

Key words Climate Change Kyoto Protocol Validation Clean Development Mechanism	Service Area Verification
	Market Sector
	Manufacturing Industry.
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[Appendix A Validation Protocol](#)

***Abbreviations***

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CH ₄	Methane
CL	Clarification request
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
DNV	Det Norske Veritas
DNA	Designated National Authority
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Plan
N ₂ O	Nitrous oxide
NGO	Non-governmental Organisation
ODA	Official Development Assistance
PDD	Project Design Document
UNFCCC	United Nations Framework Convention on Climate Change



1 INTRODUCTION

EcoSecurities Ltd. has commissioned Det Norske Veritas Certification Ltd. (DNV) to validate the “Lazaro Energy Efficiency Project” in Mexico (hereafter called “the project”). This report summarises the findings of the validation of the project, performed on the basis of UNFCCC criteria for CDM projects, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The validation team consisted of the following personnel:

Michael Lehmann	DNV Oslo, Norway	Team Leader, Energy sector expert, Technical reviewer
Mr. Lai Chee Keong	DNV Kuala Lumpur, Malaysia	GHG auditor,
Mr. Praveen Nagaraje URS	DNV Bangalore, India	GHG auditor
Mr. Alfonso Capuchino	DNV Mexico City, Mexico	GHG auditor

1.1 Validation Objective

The purpose of a validation is to have an independent third party assess the project design. In particular, the project's baseline, monitoring plan, and the project's compliance with relevant UNFCCC and host Party criteria are validated in order to confirm that the project design, as documented, is sound and reasonable and meets the 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).

1.2 Scope

The validation scope is defined as an independent and objective review of the project design document (PDD). The PDD is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords, the simplified modalities and procedures for small-scale CDM project activities and the relevant decisions by the CDM Executive Board, including the approved simplified baseline and monitoring methodology AMS-II.D. The validation team has, based on the recommendations in the Validation and Verification Manual /5/ employed a risk-based approach, 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 project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design.

1.3 Description of Proposed CDM Project

The “Lazaro Energy Efficiency Project” is an energy efficiency improvement project at the sugar mill of Ingenio Lázaro Cárdenas, S.A. de C.V. located near Taretan in the region of Michoacán, Mexico.

The project will increase the efficiency of the sugar milling process, thereby reducing the use of heavy fuel oil and consequently eliminating the CO₂ emissions associated with heavy fuel oil use. The usage of heavy fuel oil is expected to be eliminated from 6.72 litres/ton of sugar cane



crushed to 0 litres/ton of sugar cane crushed. The project's average annual emission reductions are forecasted to be 6414 tCO₂e (tons of carbon dioxide equivalent).

2 METHODOLOGY

The validation consisted of the following three phases:

- I a desk review of the project design, baseline and monitoring plan
- II follow-up interviews with project stakeholders
- III the resolution of outstanding issues and the issuance of the final validation report and opinion.

In order to ensure transparency, a validation protocol was customised for the project, according to the Validation and Verification Manual /5/. The protocol shows in 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 for the "Lazaro Energy Efficiency Project" is enclosed in Appendix A to this report.

Findings established during the validation can either be seen as a non-fulfilment of validation protocol criteria or where a risk to the fulfilment of project objectives is identified. Corrective Action Requests (CAR) are issued, where:

- i) mistakes have been made with a direct influence on project results;
- ii) validation protocol requirements have not been met; or
- iii) there is a risk that the project would not be accepted as a CDM project or that emission reductions will not be certified.

The term Clarification may be used where additional information is needed to fully clarify an issue.



Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities			
Requirement	Reference	Conclusion	Cross reference
<i>The requirements the project must meet.</i>	<i>Gives reference to the legislation or agreement where the requirement is found.</i>	<i>This is either acceptable based on evidence provided (OK), a Corrective Action Request (CAR) of risk or non-compliance with stated requirements or a request for Clarification (CL) where further clarifications are needed.</i>	<i>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.</i>

Validation Protocol Table 2: Requirement Checklist				
Checklist Question	Reference	Means of verification (MoV)	Comment	Draft and/or Final Conclusion
<i>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 sub-divided. The lowest level constitutes a checklist question.</i>	<i>Gives reference to documents where the answer to the checklist question or item is found.</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 (OK), or a Corrective Action Request (CAR) due to non-compliance with the checklist question (See below). A request for Clarification (CL) is used when the validation team has identified a need for further clarification.</i>

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

Figure 1 Validation protocol tables



2.1 Review of Documents

The PDD /1/ (version 4 of 28 November 2005 and version 5 of 13 March 2006) submitted by EcoSecurities and additional background documents related to the project design and baseline were assessed as a part of the validation.

2.2 Follow-up Interviews

On 15-16 February 2006 DNV performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of Ingenio Lázaro Cárdenas, S.A. de C.V. were interviewed. The main topics of the interviews are summarised in Table 1.

Table 1 Interview topics

Interviewed organisation	Interview topics
Ingenio Ingenio Lázaro Cárdenas, S.A. de C.V.	<ul style="list-style-type: none"> ➤ Provisions for training and maintenance for the project ➤ Procedures for project management, monitoring and recording, including day-to-day record handling ➤ Construction/ operating permits ➤ Environmental Impact Assessment and relevant permits/approval ➤ Minutes of meeting from the local stakeholder consultation ➤ The feasibility study of the project and project lifetime ➤ Date of commissioning for the project ➤ Additionality and barriers to the project ➤ Incentives in place to invest in the energy efficiency project

2.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation was to resolve any outstanding issues which need to be clarified for DNV's positive conclusion on the project design. Two Corrective Action Requests (CARs) were identified by DNV and presented to the project participants in a draft validation report dated 9 March 2006. These requests were addressed to DNV's satisfaction and the project participants submitted a revised PDD (version 5 of 13 March 2006).

To guarantee the transparency of the validation process, the concerns raised and responses given are documented in the validation protocol in Appendix A.



3 VALIDATION FINDINGS

The findings of the validation are stated in the following sections. The validation criteria (requirements), the means of verification and the results from validating the identified criteria are documented in more detail in the validation protocol in Appendix A.

The final validation findings relate to the project design as documented and described in the PDD dated 13 March 2006.

3.1 Participation Requirements

The project participants are Ingenio Lázaro Cárdenas, S.A. de C.V. of Mexico, EcoSecurities, Ltd. of the United Kingdom and Cargill of Switzerland. The host Party Mexico and the Annex I Parties the United Kingdom and Switzerland meet the requirements to participate in the CDM. Letter of Approvals, including authorization of the project participants, by the DNA of Mexico, the United Kingdom and Switzerland, including a confirmation by the DNA of Mexico that the project assists in achieving sustainable development, have been obtained.

The validation did not reveal any information that indicates that the project can be seen as a diversion of official development assistance (ODA) funding towards Mexico.

3.2 Project Design

The project consists of several activities undertaken in two phases as follows:

Phase I: The retrofit of a low pressure boiler, the installation of a 3000 kW turbine and the installation of two evaporators and two hydraulic engines within the sugar processing plant will increase the efficiency of energy generation. The phase I activities will reduce the consumption of heavy fuel oil by 5.72 litres/ton of sugar to 1 litre/ton of sugarcane.

Phase II: The increase of heat exchange surface area of the two existing evaporators and the acquisition and installation of new components in the sugarcane shredding process will increase the thermal efficiency of the process. These activities eliminate the use of heavy fuel oil completely.

Both phases, on completion, will increase the energy generation efficiency of the sugar mill. As a result of the efficiency improvement, the consumption of heavy fuel oil (6.72 litres/ton of sugar cane crushed) and the associated GHG emissions will be eliminated.

The project applies a renewable crediting period of 7 years starting on 24 April 2006. The project started construction on 12 May 2005, and the expected operational lifetime of the project is 21 years.

3.3 Baseline Determination

The project applies an approved simplified baseline methodology as stipulated in Appendix B for the simplified modalities and procedures for small-scale CDM project activities /6/. The methodology selected is AMS-II.D “Energy efficiency and fuel switching measures for industrial facilities”. This is justified as the project activity is an energy efficiency measures an industrial facility and the aggregated energy savings do not exceed 45 GWh_{th}/year.



In accordance with AMS-II.D the energy baseline consists of the energy use of the existing equipment that is replaced. The baseline consists of the aggregated energy use of the existing equipment that will be replaced by the retrofitting and new equipment installation measures. Reviewing operation records for the harvesting seasons 2000/01 to 2004/05, DNV was able to confirm that the historic fuel consumption was 6.72 litres of heavy fuel oil per ton of sugar cane crushed.

3.4 Additionality

The project's additionality is demonstrated in accordance with the barrier test described in attachment A to Appendix B for the simplified modalities and procedures for small-scale CDM project activities /6/. It is sufficiently demonstrated that the project faces barriers and that emission reductions thus are additional.

The following barriers have been identified:

- (a) Investment barriers: The decrease in international prices for sugar, increasing production costs and declining sales volume due to stiff competition from imports of sugar from the US have severely affected cash flows of Mexican sugar mills. As a consequent, sugar mills, and the sugar mill of Ingenio Lázaro Cárdenas, S.A. de C.V. in particular, face barriers in raising the necessary investment for carrying out energy efficiency improvements.
- (b) Prevailing practice: The prevailing practise in the Mexican sugar mills to use heavy fuel oil in addition to bagasse for energy generation.
- (c) Institutional Barrier: Since the sugar industry in Mexico is essential to the economic growth of Mexico, Government takeover presents a big risk in the sugar industries. This was witnessed in 1978-88 and represents a significant barrier for significant modernisations and investments by private sugar mill owners in the improvement of the efficiency of energy generation at sugar mills.

3.5 Monitoring Plan

The monitoring methodology is in line with the approved monitoring methodology AMS-II.D.

The energy used by the industrial process (litres of fossil fuel) and tonnes of sugarcane crushed (tonnes/day) are monitored on a daily basis. From this parameters, the energy savings and thus emission reductions are determined applying a baseline energy efficiency of 6.72 litres of heavy fuel oil per ton of sugar cane crushed.

The procedure for data collection and data processing (i.e. responsibility and authority of registration, monitoring, measurement, reporting, auditing and corrective action etc.) are as per the ISO 9000 certified management system of Ingenio Lazaro Cardenas, S.A. de C.V.

3.6 Calculation of GHG Emissions

The calculation of GHG emissions saving from the project has been based on the formulae given in AMS-II.D.

The project will increase the efficiency of the sugar milling process, thereby reducing and eventually eliminating the use of heavy fuel oil and consequently eliminating the CO₂ emissions associated with heavy fuel oil use. The project is estimated to reduce GHG emissions by an



average of 6414 tCO₂e per year for the duration of the project activity. Reasonable assumptions have been used for the ex-ante estimation of emission reductions.

3.7 Environmental Impacts

According to Article 6 of the Mexican Environmental Law the activities of the project does not require an Environmental Impact Assessment.

3.8 Comments by Local Stakeholders

A stakeholder consultation event was held in Taretan City on 22 November 2005. A total of 21 people were invited, representing local authorities, labour unions, academy (local students and professors from middle and high school), employees from Lazaro Cardenas Mill, sugar growers, local media, and members of the community.

The consultation was carried out to allow stakeholders to understand the basic concepts related to climate change and the Kyoto Protocol and get a feedback.

The summary of comments received is provided in the PDD. The main concern was regarding the ash control from the chimney. Another concern was concerning the open air burning in the fields. Due account has been taken of the comment received. With respect to the comment on ash control, it was explained that filters are installed in the chimney. The concern on the pollution from open air burning is not related to the project and will be taken into account by the cane growers association.

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

The PDD of 28 November 2005 was made publicly available on DNV's climate change website (www.dnv.com/certification/climatechange) and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 17 December 2005 to 15 January 2006.

No comments were received.



5 VALIDATION OPINION

Det Norske Veritas Certification Ltd. (DNV) has performed a validation of the “Lazaro Energy Efficiency Project” in Mexico. The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism (CDM) as well as criteria given to provide for consistent project operations, monitoring and reporting.

The review of the project design document and the subsequent follow-up interviews have provided DNV with sufficient evidence to determine the fulfilment of stated criteria.

The project will increase the efficiency of the sugar milling process, thereby reducing the use of heavy fuel oil and consequently eliminating the CO₂ emissions associated with heavy fuel oil use.

The project participants are Ingenio Lázaro Cárdenas, S.A. de C.V. of Mexico, EcoSecurities, Ltd. of the United Kingdom and Cargill of Switzerland. The host Party Mexico and the Annex I Parties the United Kingdom and Switzerland meet the requirements to participate in the CDM. Letter of Approvals by the DNA of Mexico, the United Kingdom and Switzerland, including a confirmation by the DNA of Mexico that the project assists in achieving sustainable development, have been obtained.

Being an energy efficiency measures an industrial facility and the aggregated energy savings do not exceed 45 GWh_{th}/year, the project is eligible to apply the approved simplified baseline methodology AMS-II.D “Energy efficiency and fuel switching measures for industrial facilities. The baseline methodology has been correctly applied and the assumptions made for the selected baseline scenario are sound. The selected baseline scenario is the aggregated energy use of the existing equipment that will be replaced by the retrofitting and new equipment installation measures. It is sufficiently demonstrated that the project is not a likely baseline scenario and that emission reductions attributable to the project are thus additional.

By reducing and eventually eliminating the use of heavy fuel oil, the project will result in emission reductions that are real, measurable and will give long-term benefits to the mitigation of climate change. The emission reductions forecast stated in the PDD is a likely estimate.

The monitoring methodology AMS-II.D has been correctly applied. The monitoring plan provides for monitoring of the indicators necessary for the ex-post determination of project and baseline emissions.

Local stakeholders’ comments were consulted and comments received were taken into account in the project design. Comments by Parties, stakeholders and NGOs were also invited and no comments were received.

In summary, it is DNV’s opinion that the project, as described in the project design document of 13 March 2006, meets all relevant UNFCCC requirements for the CDM and correctly applies the approved simplified baseline and monitoring methodology AMS-II.D. Hence, DNV requests the registration of the “Lazaro Energy Efficiency Project in Mexico as CDM project activity.



REFERENCES

Documents provided by the project proponent that relate directly to the project:

- /1/ EcoSecurities Ltd: *CDM-SSC-PDD for the "Lazaro Energy Efficiency Project"*, Version 4 of 28 November 2005 and version 5 of 13 March 2006.
- /2/ DNA of Mexico: *Letter of Approval*, dated 23 January 2006
- /3/ DNA of UK: *Letter of Approval*, dated 2 February 2006
- /4/ DNA of Switzerland: *Letter of Approval*, dated 17 February 2006

Background documents related to the design and/or methodologies employed in the design or other reference documents:

- /5/ International Emission Trading Association (IETA) & the World Bank's Prototype Carbon Fund (PCF): *Validation and Verification Manual*, <http://www.vvmanual.info>
- /6/ CDM Executive Board: *Appendix B of the simplified modalities and procedures for small-scale CDM project activities: Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories*, Version 07 of 28 November 2005.
- /7/ National Chamber for Sugar and Alcohol Industries (2005) *Desarrollo Agroindustrial Azucarero 1999-2005*, Mexico
- /8/ IPCC: *Guidelines for National Greenhouse Gas Inventories, 1996 Workbook*
- /9/ PEMEX Bunker oil specification and quality certificate.

Persons interviewed during the validation, or persons who contributed with other information that are not included in the documents listed above:

- /10/ José Alejandro Guevara Alba (Gerente General), Ingenio Lázaro Cárdenas
- /11/ José Alfonso García Vidales (Jefe de Instrumentación), Ingenio Lázaro Cárdenas
- /12/ J. Jesus Orozco torres (Encargado de seguridad ambiental y medio ambiente), Ingenio Lázaro Cárdenas
- /13/ Romeo Cortes (Contador General), Ingenio Lázaro Cárdenas
- /14/ Maria Luisa Sigala Vargas (Superintendente de control químico de calidad), Ingenio Lázaro Cárdenas

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APPENDIX A

VALIDATION PROTOCOL FOR SMALL-SCALE CDM PROJECT ACTIVITIES

Table 1 Mandatory Requirements for Small Scale 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	OK	Table 2, Section E.4.1, The project assists the UK and Switzerland in achieving compliance with part of their emission reduction commitment.
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, Simplified Modalities and Procedures for Small Scale CDM Project Activities §23a	OK	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.	OK	Table 2, Section E.4.1
4. The project shall have the written approval of voluntary participation from the designated national authority of each party involved	Kyoto Protocol Art. 12.5a, Simplified Modalities and Procedures for Small Scale CDM Project Activities §23a	OK	DNA approval from Mexico dated 23 January 2006, DNA approval from UK is dated 2 February 2006 and DNA approval from Switzerland dated 17 February 2006
5. The emission reductions should be real, measurable and give long-term benefits related to the mitigation of climate change	Kyoto Protocol Art. 12.5b	OK	Table 2, Section E.1 to E.4
6. Reduction in GHG emissions must 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. 12.5.c, Simplified Modalities and Procedures for Small Scale CDM Project Activities §26	OK	Table 2, Section B.2.1 The project will displace the consumption of fossil fuel in the sugar milling process.
7. In case public funding from Parties included in Annex I	Decision 17/CP.7,	OK	No public funding is received for the

Requirement	Reference	Conclusion	Cross Reference / Comment
is used for the project activity, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties.	CDM Modalities and Procedures Appendix B, § 2		project.
8. Parties participating in the CDM shall designate a national authority for the CDM	CDM Modalities and Procedures § 29	OK	Mexico: Autoridad Nacional Competente UK: Department for Environment, Food and Rural Affairs Switzerland: Swiss Agency for the Environment, Forests and Landscape (SAEFL), Economics and Climate Section.
9. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol	CDM Modalities and Procedures § 30, 31b	OK	The host country Mexico ratified the Kyoto Protocol on 07 September 2000. The UK ratified the Kyoto Protocol on 31 May 2002 and Switzerland ratified the Kyoto Protocol on 09 July 2003.
10. The participating Annex I Party's assigned amount shall have been calculated and recorded	CDM Modalities and Procedures §31b	OK	The assigned amounts of the United Kingdom and Switzerland have been calculated. The United Kingdom's and Switzerland's assigned amount is 92% of the emissions in 1990.
11. The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7	CDM Modalities and Procedures §31b	OK	Both the United Kingdom and Switzerland have in place a national systems for estimating GHG emissions and report their latest inventory on an annual basis to the UNFCCC.

Requirement	Reference	Conclusion	Cross Reference / Comment
12. The proposed project activity shall meet the eligibility criteria for small scale CDM project activities set out in § 6 (c) of the Marrakesh Accords and shall not be a debundled component of a larger project activity	Simplified Modalities and Procedures for Small Scale CDM Project Activities §12a,c	OK	Table 2, Section A.1, The project is not a debundled component of a larger project activity.
13. The project design document shall conform with the Small Scale CDM Project Design Document format	Simplified Modalities and Procedures for Small Scale CDM Project Activities, Appendix A	OK	The PDD conforms to the requirement of version 02 of the small scale CDM PDD.
14. The proposed project activity shall confirm to one of the project categories defined for small scale CDM project activities and uses the simplified baseline and monitoring methodology for that project category	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22e	OK	Table 2, Section A.1.3, B and D
15. Comments by local stakeholders are invited, and a summary of these provided	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22b	OK	Table 2, Section G
16. If required by the host country, an analysis of the environmental impacts of the project activity is carried out and documented	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22c	OK	Table 2, Section F
17. Parties, stakeholders and UNFCCC accredited NGOs have been invited to comment on the validation requirements and comments have been made publicly available	Simplified Modalities and Procedures for Small Scale CDM Project Activities §23b,c,d	OK	The PDD of 28 November 2005 was made publicly available on DNV's climate change website (www.dnv.com/certification/climatechange) and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 17 December 2005 to 15 January 2006. No comments were received.

Table 2 Requirements Checklist

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
A. Project Description The project design is assessed.					
A.1. Small scale project activity It is assess whether the project qualifies as small scale CDM project activity.					
A.1.1. Does the project qualify as a small scale CDM project activity as defined in paragraph 6 (c) of decision 17/CP.7 on the modalities and procedures for the CDM?	/1/	DR	Yes, the project qualifies as type II.D small-scale CDM project activity as it involves energy efficiency at a single industrial facility, with the aggregate energy savings not exceeding the equivalent of 15 GWh _e per year.		OK
A.1.2. The small scale project activity is not a debundled component of a larger project activity?	/1/	DR	It is confirmed that the project is not a debundled component of a large project activity.		OK
A.1.3. Does proposed project activity confirm to one of the project categories defined for small scale CDM project activities?	/1/	DR	Yes, the project activity conforms to the small scale category II.D. "Energy efficiency and fuel switching measures for industrial facilities".		OK
A.2. Project Design Validation of project design focuses on the choice of technology and the design documentation of the project.					
A.2.1. Are the project's spatial (geographical) boundaries clearly defined?	/1/	DR	Yes, the project is located at Taretan in Michoacán, México.		OK
A.2.2. Are the project's system (components and facilities used to mitigate GHG's) boundaries clearly defined?	/1/	DR	The project consists of several activities undertaken in two phases. Phase I: Retrofit of a low pressure boiler and the		OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			<p>installation a 3000kW turbine, two evaporators and two hydraulic engines within the sugar processing plant to increase the efficiency of the process and reducing the use of heavy fuel oil consumed to 1lit/ton of sugarcane. The phase I activities are expected to reduce fuel consumption of 5.72 lit/ton of sugarcane from the original specific consumption of 6.72 lit/ton.</p> <p>Phase II: Increasing of the heat exchanger surface area of the two existing evaporators (3,000 ft² each) and the acquisition and installation of new components in the sugarcane shredding process to increase the thermal efficiency of the process and eliminating the use of heavy fuel oil completely. The phase II activities are estimated to be able to reduce the use of fuel oil completely.</p>		
A.2.3. Does the project design engineering reflect current good practices?	/1/	DR I	Yes, the project design engineering is being transferred from Brazil, where the sugar industry is highly developed. The engineering consultants for the project have proven experience on thermal efficiency improvements in sugar industry. Hence the project design engineering reflects current good practices.		OK
A.2.4. Will the project result in technology transfer to the host country?	/1/	DR I	No the project does not result in the technology transfer to the host country as similar kind of projects already exists in other plants of the country.		OK
A.2.5. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period? Does the project make provisions for meeting training and maintenance	/1/	DR I	Yes, it is confirmed during site visit that the boiler and pre-evaporator's technology is well know technology in Mexico and company employees are well versed with the operation and maintenance of the system.		OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
needs?			For operating of the hydraulic motors two employees were trained in Sweden by the equipment manufacturer. Training has been imparted by the equipment supplier of the hydromechanics cleaning system for the operation and maintenance requirements.		
A.3. Contribution to Sustainable Development The project's contribution to sustainable development is assessed					
A.3.1. Will the project create other environmental or social benefits than GHG emission reductions?	/1/	DR	Yes. The project will improve the existing working conditions; reduce production costs, by way of energy efficiency.		OK
A.3.2. Will the project create any adverse environmental or social effects?	/1/	DR	No The project will not create any adverse environmental or social effect.		OK
A.3.3. Is the project in line with sustainable development policies of the host country?	/1/	DR	Yes the granting of Letter of Approval by the host country confirms that the project is in line with Mexico's sustainability development policies..		OK
A.3.4. Is the project in line with relevant legislation and plans in the host country?	/1/	DR	The legal requirements of the host country are an operation license, the submission of annual operation reports and an environmental permit. The project is in compliance with all above mentioned requirements.		OK

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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 selected baseline methodology in line with the baseline methodologies provided for the relevant project category?	/1/	DR	Yes, the selected baseline methodology for the project is AMS II.D "Energy efficiency and fuel switching measures for industrial facilities" of Appendix B of the simplified modalities and procedures for small-scale CDM project activities.		OK
B.1.2. Is the baseline methodology applicable to the project being considered?	/1/	DR	Yes, the baseline as per AMS II.D is the energy use of the existing equipment that is replaced in the case of a retrofit measure. Since the project involves a retrofitting operation the baseline methodology is applicable.		OK
B.2. Baseline Determination It is assessed whether the project activity itself is not a likely baseline scenario and whether the selected baseline represents a likely baseline scenario.					
B.2.1. Is it demonstrated that the project activity itself is not a likely baseline scenario due to the existence of one or more of the following barriers: investment barriers, technology barriers, barriers due to	/1/	DR I	The project's additionality is demonstrated in accordance with the barrier test described in attachment A to Appendix B for the simplified modalities and procedures for small-scale CDM project activities. It is sufficiently demonstrated that		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
prevailing practice or other barriers?			<p>the project faces barriers and that emission reductions thus are additional.</p> <p>The following barriers have been identified:</p> <p>(a) Investment barriers: The decrease in international prices for sugar, increasing production costs and declining sales volume due to stiff competition from imports of sugar from the US have severely affected cash flows of Mexican sugar mills. As a consequent, sugar mills, and the sugar mill of Ingenio Lázaro Cárdenas, S.A. de C.V. in particular, face barriers in raising the necessary investment for carrying out energy efficiency improvements.</p> <p>(b) Prevailing practice: The prevailing practise in the Mexican sugar mills to use heavy fuel oil in addition to bagasse for energy generation.</p> <p>(c) Institutional Barrier: Since the sugar industry in Mexico is essential to the economic growth of Mexico, Government takeover presents a big risk in the sugar industries. This was witnessed in 1978-88 and forms a major barrier for significant modernisations and investments by private sugar mill owners in the improvement of the efficiency of energy generation at sugar mills.</p>		
B.2.2. Is the application of the baseline methodology and the discussion and determination of the chosen baseline transparent and conservative?	/1/	DR	The proposed CDM project has been categorized as energy efficiency improvement project and its energy savings are less than 45 GWh _{th} per year in fuel input as stipulated in AMS II.D. The baseline methodology is transparently and conservatively applied.		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
B.2.3. Are relevant national and/or sectoral policies and circumstances taken into account?	/1/	DR	The National policies favour energy conservation and energy efficiency improvements. These policies have been taken into account in the determination of the baseline.		OK
B.2.4. Is the baseline selection compatible with the available data?	/1/	DR	Yes the baseline is determined based on the historic available data of sugarcane crushed, fuel oil consumption, energy supplied and emission coefficient of the fuel.		OK
B.2.5. Does the selected baseline represent the most likely scenario describing what would have occurred in absence of the project activity?	/1/	DR	Yes, in the absence of the project activity the mill would have continued co-firing heavy fuel oil to fulfil the demand for steam in the sugar milling process.		OK
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?	/1/	DR	The project starting date is 12/05/2005; and the expected operational life-time of the project is 21 years.		OK
C.1.2. Is the assumed crediting time clearly defined (renewable crediting period of seven years with two possible renewals or fixed crediting period of 10 years with no renewal)?	/1/	DR	A renewable crediting period of 7 years is selected with the starting date of 01/01/2006. However, as the project started after the registration of the first CDM project (18 November 2004), the crediting period can only be start after the registration of the project.	CAR-1	OK

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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.					
D.1. Monitoring Methodology It is assessed whether the project applies an appropriate monitoring methodology.					
D.1.1. Is the selected monitoring methodology in line with the monitoring methodologies provided for the relevant project category?	/1/	DR	The monitoring methodology is in line with the approved monitoring methodology AMS-II.D.		OK
D.1.2. Is the monitoring methodology applicable to the project being considered?	/1/	DR	Yes The project activity fulfils the applicability criteria as stipulated in AMS II.D		OK
D.1.3. Is the application of the monitoring methodology transparent?	/1/	DR	Yes		Ok
D.1.4. Will the monitoring methodology give opportunity for real measurements of achieved emission reductions?	/1/	DR	Yes, the project will reduce and eventually eliminate the use of heavy fuel oil completely and consequently avoid CO ₂ emissions.		OK
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 boundary during the crediting	/1/	DR	Yes, energy used by the industrial processes (Ltr fossil fuel), and sugarcane crushed (tonnes/day) are being measured on a daily basis. From this parameters, the energy savings and thus emission reductions are determined applying a baseline		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
period?			energy efficiency of 6.72 litres of heavy fuel oil per ton of sugar cane crushed.		
D.2.2. Are the choices of project GHG indicators reasonable?	/1/	DR	Yes.		OK
D.2.3. Will it be possible to monitor / measure the specified project GHG indicators?	/1/	DR	Yes, it is possible to monitor / measure the specified GHG indicators.		OK
D.2.4. Will the indicators give opportunity for real measurements of project emissions?	/1/	DR	Yes		OK
D.3. Monitoring of Leakage If applicable, 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/	DR	As per the methodology, leakage does not need to be considered as there is no equipment transferred from other activity and existing equipment is not transferred to another activity.		OK
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/	DR	Yes, the monitoring plan provides for the collection and archiving of all relevant data for determining the baseline emission during the crediting period.		OK
D.4.2. Is the choice of baseline indicators, in particular for baseline emissions, reasonable?	/1/	DR	Yes		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
D.4.3. Will it be possible to monitor / measure the specified baseline indicators?	/1/	DR	Yes, IPCC emission factors and net calorific values for heavy fuel oil are used. Daily consumption data of programmed sugar crushed and fuel consumption is available from the project developer.		OK
D.4.4. Will the indicators give opportunity for real measurements of baseline emissions?	/1/	DR	Yes		OK
D.5. Project Management Planning It is checked that project implementation is properly prepared for and that critical arrangements are addressed.					
D.5.1. Is the authority and responsibility of project management clearly described?	/1/	DR I	The organization has an ISO 9000 certified management system. Responsibilities and authorities are well defined and documented.		OK
D.5.2. Is the authority and responsibility for registration monitoring measurement and reporting clearly described?	/1/	DR I	Yes, authority has been clearly been described.		OK
D.5.3. Are procedures identified for training of monitoring personnel?	/1/	DR I	Yes, the personnel's are trained by the manufacturer and supplier for the new technology installed It is confirmed from the site interviews that the company is ISO 9000 certified and procedures for training are in place.		OK
D.5.4. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/	DR I	No emergencies causing unintended emissions are foreseen by the project.		OK
D.5.5. Are procedures identified for calibration of monitoring equipment?	/1/	DR I	Procedures for calibration are as per ISO 9000 certified quality system procedures.		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
D.5.6. Are procedures identified for maintenance of monitoring equipment and installations?	/1/	DR I	Procedures for maintenance are identified and documented as per ISO 9000 standards.		OK
D.5.7. Are procedures identified for monitoring, measurements and reporting?	/1/	DR I	Procedures are identified for the monitoring and measurement. The daily data monitored during the harvesting period is periodically reviewed by top management and these reviews are documented.		OK
D.5.8. 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/	DR I	Records control are as per ISO 9000 standards		OK
D.5.9. Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	/1/	DR I	Records control are as per ISO 9000 standards		
D.5.10. Are procedures identified for internal audits of GHG project compliance with operational requirements as applicable?	/1/	DR I	Yes and these form a part of the ISO 9000 certified procedures.		OK
D.5.11. Are procedures identified for project performance reviews?	/1/	DR I	Yes and these form a part of the ISO 9000 certified procedures.		OK
D.5.12. Are procedures identified for corrective actions?	/1/	DR I	Yes and these form a part of the ISO 9000 certified procedures.		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
E. Calculation of GHG emission 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. Project GHG Emissions The validation of ex-ante estimated project GHG emissions focuses on transparency and completeness of calculations.					
E.1.1. Are all aspects related to direct and indirect project emissions captured in the project design?	/1/	DR	The project is on final implementation not expected to generate any GHG emissions. Until the implementation of phase 2, the project is expected to use 1 litre of heavy fuel oil per ton of sugar cane crushed and emissions from heavy fuel oil are accounted.		OK
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 and estimated ex-ante.					
E.2.1. Are leakage calculation required for the selected project category and if yes, are the relevant leakage effects assessed?	/1/	DR	As per the methodology, leakage does not need to be considered as there is no equipment transferred from other activity and existing equipment is not transferred to another activity.		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
E.3. Baseline GHG Emissions The validation of ex-ante estimated baseline GHG emissions focuses on transparency and completeness of calculations.					
E.3.1. Are the baseline emissions boundaries clearly defined and do they sufficiently cover sources for baseline emissions?	/1/	DR	Yes, baseline boundaries are clearly defined and are restricted to on-site emissions only.		OK
E.3.2. Are all aspects related to direct and indirect baseline emissions captured in the project design?	/1/	DR	Yes, all aspects related to direct and indirect baseline boundaries have been considered.		OK
E.3.3. Have all relevant greenhouse gases and sources been evaluated?	/1/	DR	Yes, the relevant GHG CO ₂ is considered.		OK
E.3.4. Do the methodologies for calculating baseline emissions comply with existing good practice?	/1/	DR	Yes, monitoring parameters proposed in the PDD are fully consistent with AMS II.D. Baseline emission are calculated based on <ol style="list-style-type: none"> 1) the historic data's available from National Chambers for Sugar and Alcohol Industries 2) IPCC values 3) Programmed data available with project developer. 		OK
E.3.5. Are the calculations documented in a complete and transparent manner?	/1/	DR	Different amounts of sugarcane crushed have been reported in the estimation of baseline and project emissions. This seems to be a mistake and the PDD should be corrected accordingly.	CAR-2	OK
E.3.6. Have conservative assumptions been used?	/1/	DR	Yes, IPCC default values for the net calorific value and emission coefficient are considered for the project.		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
E.3.7. Are uncertainties in the baseline emissions estimates properly addressed?	/1/	DR	No uncertainties are foreseen.		OK
E.4. Emission Reductions Validation of ex-ante estimated emission reductions.					
E.4.1. Will the project result in fewer GHG emissions than the baseline case?	/1/	DR	Yes, the project is estimated to reduce an average of 6414 tCO ₂ e / per year for the duration of the project activity. Emission reductions of approximately of 44 898 tCO ₂ e are estimated for the first 7-year crediting period.		OK
F. Environmental Impacts It is assessed whether environmental impacts of the project are sufficiently addressed.					
F.1.1. Does host country legislation require an analysis of the environmental impacts of the project activity?	/1/	DR I	No (reference to Article 6 of the Mexican Environmental Law ((Ley General Del Equilibrio Ecologico y la Protección al Ambiente) the activities of the project do not require an Environmental Impact Assessment as per Mexican legislation.		OK
F.1.2. Does the project comply with environmental legislation in the host country?	/1/	DR I	Yes, an environmental permit has been obtained on 26 November 2004.		OK
F.1.3. Will the project create any adverse environmental effects?	/1/	DR	No.		OK
F.1.4. Have environmental impacts been identified and addressed in the PDD?	/1/	DR	Since the project does not involve much of construction work, and since the plant is already in operation, environmental impacts have not been identified and justified.		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
G. Comments by Local Stakeholder Validation of the local stakeholder consultation process.					
G.1.1. Have relevant stakeholders been consulted?	/1/	DR I	Yes, a stakeholder's consultation process was held in Taretan City on 22 November 2005. 21 people were invited, representing local authorities, labour unions, academy, employees, local media, local agricultures and cattleman.		OK
G.1.2. Have appropriate media been used to invite comments by local stakeholders?	/1/	DR	The stake holder consultation process was advertised in the major local newspaper.		OK
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/	DR	There is no legal requirement in Mexico that requires the stakeholders' consultation meeting. The consultation was carried out to allow stakeholders to understand the basic concepts related to climate change and the Kyoto Protocol and get a feedback.		OK
G.1.4. Is a summary of the comments received provided?	/1/	DR I	The summary of comments received is provided in the PDD. The main concern was regarding the ashes control from the chimneys. Another concern was on the open air burning in the fields.		OK
G.1.5. Has due account been taken of any comments received?	/1/	DR I	Due account has been taken of the comments received. With respect to the comments on ash control, it is explained that filters are installed in the chimneys The concern on the pollution from open air burning is not related to the project and will be taken into account by the cane growers association.		OK

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Table 3 Resolution of Corrective Action and Clarification Requests

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
<p>CAR 1:</p> <p>The indicated starting date of the renewable 7 years crediting period is 01/01/2006. However, since the project started after the registration of the first CDM project (18 November 2005), the crediting period may only start after the date of registration of the project.</p>	C.1.2	<p>The starting date of the crediting period was revised to 24 April 2006 in the PDD dated 13 March 2006.</p>	<p>OK</p> <p>The starting date of the crediting period is after the likely registration of the project activity.</p>
<p>CAR 2:</p> <p>Different amounts of sugarcane crushed have been reported in the estimation of baseline and project emissions. This seems to be a mistake and the PDD should be corrected accordingly.</p>	E.3.5	<p>The reported amount of sugarcane crushed have been corrected in the PDD dated 13 March 2006.</p>	<p>OK</p> <p>The data reported in section E of the PDD was corrected and the reported amount of sugarcane crushed are now consistent.</p>

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