CLEAN DEVELOPMENT MECHANISM
SIMPLIFIED PROJECT DESIGN DOCUMENT
FOR SMALL-SCALE PROJECT ACTIVITIES (SSC-CDM-PDD)
Version 02

Lazaro Energy Efficiency Project in Mexico

March 2006

CONTENTS

SECTION A. General description of the small-scale project activity

A.1. Title of the small-scale project activity:

>>
Lazaro Energy Efficiency Project
Version 5
13 March 2006

A.2. Description of the small-scale project activity:

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The Lazaro Energy Efficiency Project (hereafter, "the Project") developed by Ingenio Lázaro Cárdenas, S.A. de C.V. (hereafter, the "Project Developer") is an energy efficiency improvement project in the region of Michoacán in Mexico (hereafter, the "Host Country").

A.2.1. Purpose of Project Activity

The Project will increase the efficiency of the sugar milling process, reducing the usage of heavy oil from 6.72 litres/ton to 0 litres/ton of sugar cane crashed and consequently reducing CO_2 emissions.

The project consists of several activities undertaken in two phases. First, the retrofit of a low pressure boiler and the installation a 3000kW turbine, two evaporators and two hydrolic engines within the sugar processing plant will increase the efficiency of the process, reducing the use of heavy oil consumed to 1lt/ton of sugarcane. Second, the increase of the heat exchange surface of two existent evaporators (3,000ft^2 each) and the acquisition and installation of new components in the sugarcane shredding process will increase the thermal efficiency of the process, eliminating the use of heavy oil completely, and consequently avoiding CO2 emissions.

The history and organization of the Mexican sugar industry is complex, and the viability of the industry is a political imperative. At present, Mexico is the 7th largest producer of sugar globally and approximately 2.2 million Mexicans depend on the industry as their source of income. The industry on a whole accounts for more than 300,000 jobs, including cane cutters, seasonal field workers, and factory workers. Mexico is the 7th largest consumer of sugar in the world and has experienced strong consumption growth in recent years. This increased demand can be attributed to urbanization, a relatively young population and an increase in expendable income. Over the last forty years, the Mexican sugar industry experienced a number of government interventions that resulted in bankruptcy and technological stagnation. The mandated prices forced mill operators to postpone maintenance and depend upon government-supported loans for operating expenses. Eventually, the debts exceeded the mills asset values forcing the mills into government receivership. Instead of annually exporting half a million tons of sugar, Mexico became a substantial importer. During 1990-1991 the government promoted the privatisation of the sector, yet due to a divergence between the cost of sugarcane and the price of sugar the industry fell into bankruptcy. Consequently, in September of 2001, the Mexican government once again nationalized a portion of the sugar industry. In total, 27 mills were nationalized representing approximately 50% of Mexican sugar production. The government has been embroiled in litigation associated with the expropriation since 2001 and has in fact lost one case which result in 4 mills being returned to their former owner (GAM).

The history and risks associated with the Mexican sugar industry, along with the fact that the improvement of energy efficiency through equipment retroffiting and new equipment installation is not a

common practice indicate that significant institutional challenges and a high degree of uncertainty associated with the financial returns of the Project will be faced. Moreover, the commercial situation faced by the sugar industry and the recently approved "Law for Sustainable Development of the Mexican Sugar Industry" could result on the decapitalization of mills around the country because it requires that 57% of profits must be shared with sugar growers, reducing the opportunities to reinvest in retroffiting and new equipment installations programs.

The CDM revenue expected for the Project has been one of the key issues that encouraged the project developer to undertake the proposed project activity. The impact of approval and registration of the Project as a CDM activity will bring accountable and non-accountable benefits to the project developer, the sugar industry and the Host Country.

For the project developer, it represents extra income that will contribute with the improvement of its cash flow, while reducing its fuel-related costs and increasing the overall thermal efficiency. It will also improve the image of company as environmental and social responsible company, and alleviate the commercial, investment and institutional hurdles showed previously.

The registration of the project activity will also benefit the sugar industry and the Host Country. It will contribute on the isolation of the sector's economy from the fluctuations on price of oil, promoting a healthier and more efficient industry. The latter, will reduce the risks bankruptcy and loss of employment with in the sector.

A.2.2. Contribution to Sustainable Development

The Project is helping the Host Country promote sustainable development.by providing several social, economic and environmental benefits. It improves existent working conditions, contributes to income generation, promotes energy efficiency in the industrial sector, contributes to local environment improvement and promotes technological development and capacity building within the sugar Mexican sector. The Project:

- Improves existent working conditions by reducing the use of heavy oil, which improves air quality and personnel exposure to gasified hydrocarbons when handling the heavy oil.
- Contributes to income generation by reducing the production costs associated with purchase of heavy fuel oil.
- Promotes energy efficiency in the industrial sector, supporting governmental efforts on this matter.
- Increases the technical viability of cogeneration from sugarcane bagasse, which could be fostered in the future, since an efficient milling process would allow to drive higher quantities of steam for cogeneration purposes reducing electricity generation costs.
- Contributes to local environmental improvement by reducing use of heavy oil, thereby decreasing pollutant emissions.
- Contributes to technological development and capacity building within the sugar Mexican sector as new technology and skills are being transferred to this industry.

In the absence of the Project the mill would keep cofiring heavy oil to fulfill the demand for steam in the sugar milling process and would consequently continue discharging CO2 emission to the atmosphere.

A.3. Project participants:

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Name of Party involved (*) ((host) indicates a host Party)	Private and/or public entity(ies) project participants (*) (as applicable)		Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No)
Mexico	Ingenio Lázaro Cárdenas, S.A. de C.V.	Private	No
United Kingdom	Ecosecurities, Ltd.	Private	No
Switzerland	Cargill	Private	No

(*) In accordance with the CDM modalities and procedures, at the time of making the CDM-PDD public at the stage of validation, a Party involved may or may not have provided its approval. At the time of requesting registration, the approval by the Party(ies) involved is required.

Table A.3 Project Participants

Further contact information of project participants is provided in Annex 1.

A.4. Technical description of the small-scale project activity:

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A.4.1. Location of the small-scale project activity:

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The project is located near the city of Taretan in Michoacán, Mexico

A.4.1.1. Host Party(ies):

>>

Mexico

A.4.1.2. Region/State/Province etc.:

>>

Michoacán

A.4.1.3. City/Town/Community etc:

>>

Taretan

A.4.1.4. Detail of physical location, including information allowing the unique identification of this small-scale project activity(ies):

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The town of Taretan (19 20'N, 101 55'W) is located in the state of Michoacan. It is delimited by Ziracuaretiro municipality on the North; Nuevo Urecho y Gabriel Zamora municipalities on the East;

State of Santa Clara del Cobre y Ario de Rosales municipalities on the South; and Uruapan municipality on the West.

Mexico (23 North, 102 West) is located in America, bordering the Caribbean Sea and the Gulf of Mexico, between Belize and the US and bordering the North Pacific Ocean, between Guatemala and the US.

Taretan is located aprox. 158km Southwest from Michoacan, the capital of the State.

The project's postal address is:

Casco de ExHacienda S/N, C.P.61710, Taretan, Michoacán, México

Figure 1. Project Location

A.4.2. Type and category(ies) and technology of the small-scale project activity:

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According to Appendix B to the simplified modalities and procedures for small-scale CDM project activities, this project is a Type: II. Energy efficiency improvement project under the category: "II.D. Energy efficiency and fuel switching measures for industrial facilities".

The Project involves the improvement of thermal efficiency within the sugarcane process complying with the small-scale size thresholds for energy efficiency as the aggregated energy saving will not exceed 45GWh$_{th}$/yr.

The energy efficiency measures considered by the Project will not promote the increase of sugarcane bagasse production.

A.4.2.1 Technology to be employed by the project activity:

The selected technologies to be used in the Project are: pre-evaporators, evaporators, hydraulic engines, a steam turbine, a hydromechanic evaporator cleaning system, and components of the shredding process.

The Project has two phases:

- Phase I (2005) consists on four activities. First, the acquisition and installation of a 3,000kWh steam turbine with stream consumption of 30.4 Lbs/kWh, reducing the steam consumption by 9.12lbs/kWh. Second, the retrofit of the existing boiler No. 1 will increase its efficiency producing 21 Kg/cm2 of steam with the same fuel. Third, the acquisition of a 12,000 ft^2 pre-evaporator, the retrofit and installation of a 8,000 ft^2 evaporator and the acquisition of a hydromechanic evaporator cleaning system will contribute to maintaining the efficiency of the process along time and reducing stream consumption of the overall process. Finally, the substitution of two hydraulic engines for the steam turbines in mills Num. 3 and 5 will reduce steam consumption.
- In Phase II (2006), the heat exchange surface of two existent evaporators (3,000 ft^2 each) will be increased and the sugarcane crushing process improved to enhance the thermal efficiency of the overall production process.

Components of energy efficiency		**Components**				
Before Project	Equipment Description	2 steam turbines	1 steam turbine (2.5MWh) with steam consmption of 39.12 pounds/kWh			
With Project (2005)	Equipment Description	2 Hydraulic Engines for mills num. 3 and 5	1 steam turbine (3MWh) with steam consumption of 30.4 pounds/kWh	Retrofitting of boiler num. 1 to generate 300 Lbs/pulg2 and 100,000 Lbs/Hr. of steam generation	Evaporators' Hydromechanic Cleaning System	Pre-evaporator (12,000 ft2) and retrofitting and installation of evaporator (8,000 ft2)
	Fuel consumption reduction (lts/ton sugarcane)	5.72				
With Project (2006)	Equipment Description	Improvement of sugarcane crashing process	Increase heat exchange surface of two existent evaporators (3,000ft2 each)			
	Fuel consumption reduction (lts/ton sugarcane)	1				

Table A.4.2.1. Detailed description of the project activity components

A.4.2.2 Technology transfer

Technology and knowledge will be transfered to the host country, mainly from Brasil where the sugar industry is highly developed. The equipment for both phases will be provided mainly by domestic suppliers. The team of engineers in charge of the Project traveled to some of the most efficient sugar mills in Brasil and Nicaragua to acquire knowledge and find capable engineering consultants. There, two engineering consultants for the mill were contracted: Tecnología Azucarera S.C. (Reynaldo Mazzotti) and Julio Américo González. Both have extensive and proven experience on thermal efficiency improvement on sugar mills.

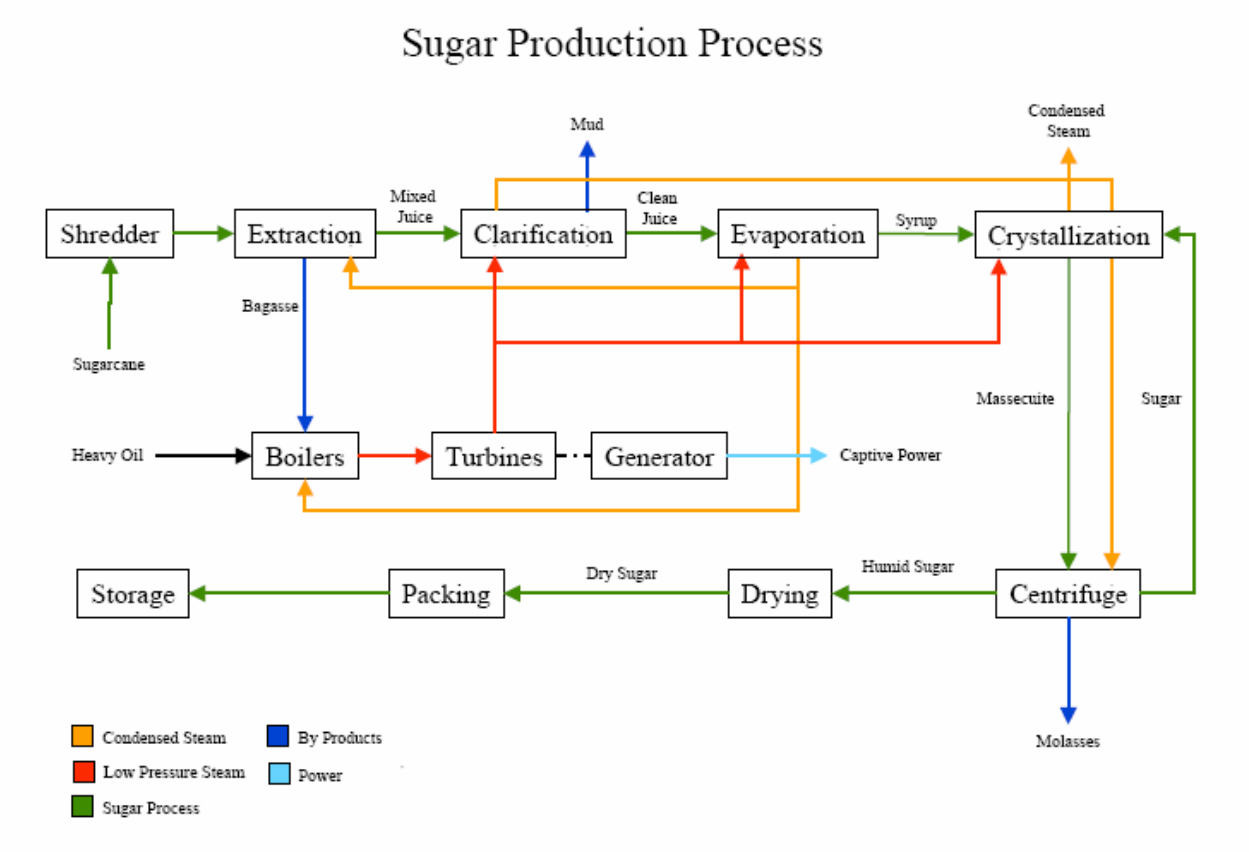

Figure 3. Sugar Production Process Diagram

A.4.3. Brief explanation of how the anthropogenic emissions of anthropogenic greenhouse gas (GHGs) by sources are to be reduced by the proposed small-scale project activity, including why the emission reductions would not occur in the absence of the proposed small-scale project activity, taking into account national and/or sectoral policies and circumstances:

>>

How the emissions are reduced

The Project will increase the efficiency of the sugar milling process, thereby reducing use of heavy oil from 6.72 to 0 litres/ton of sugar cane crushed and consequently eliminating the CO2 emissions associated with heavy fuel oil use.

The project consists of several activities undertaken in two phases. First the retrofit of a low pressure boiler and the installation of a 3000kW turbine, two evaporators and two hydrolic engines will increase the efficiency of the process, and reduce the use of heavy oil to 1lt/ton of sugarcane. Second, the increase of the heat exchange surface of two existent evaporators (3,000ft2 each) and the acquisition and installation of a "volteadora de hilo" and "Desfibradora" will further reduce CO2 emissions by increasing the thermal efficiency of the process and eliminating the use of heavy oil completely.

Why the emission reductions would not occur otherwise

As mentioned in Section A.2.1., the institutional, commercial and regulatory risks associated with the sugar industry in Mexico result in high degree of uncertainty about the financial returns of the investment in the Project and the Project would not be done with out the CDM incentives. Given this, the GHG emission reductions would not occur as heavy oil would be still needed to produce enough steam for the sugar milling process.

A.4.3.1 Estimated amount of emission reductions over the chosen crediting period:

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Years	**Annual estimation of emission reductions in tonnes of CO2e**
2006	4,445
2007	5,913
2008	6,433
2009	6,903
2010	7,068
2011	7,068
2012	7,068
Total estimated reductions (tonnes of CO2e)	44,898
Total number of crediting years	7
Annual average over the crediting period of estimated reductions (tonnes of CO2e)	6,414

A.4.4. Public funding of the small-scale project activity:

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The project will not receive any public funding from Parties included in Annex I of the UNFCCC. Project finance will be provided by Grupo Azucarero Mexico, SA de CV.

A.4.5. Confirmation that the small-scale project activity is not a debundled component of a larger project activity:

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The Project is not a debundled component of a large project activity as there is no registered small-scale CDM project activity or any application to register another small-scale CDM project activity within the previous 2 years with the same project participants; in the same project category and technology/measure; and whose project boundary is within 1 km of the project boundary of the Project at the closest point.

SECTION B. Application of a baseline methodology:

B.1. Title and reference of the approved baseline methodology applied to the small-scale project activity:

>>
AMS II.D "Energy efficiency and fuel switching measures for industrial facilities".

B.2 Project category applicable to the small-scale project activity:

>>

The "Energy efficiency and fuel switching measures for industrial facilities" is justified as The Project involves the improvement of thermal efficiency within the sugarcane process. It complies with the small-scale size thresholds for energy efficiency, as the aggregated energy saving will not exceed 45GWhth/yr.

The following table provides the key information (variables, parameters, etc.) and data used to determine the baseline scenario:

Table B.2 Sources of data used for baseline estimation

Variable	Unit	Data Source
Historic sugarcane crushed	tonnes/year	National Chamber for Sugar and Alcohol Industries (2005), Desarrollo Agroindustrial Azucarero 1999-2005, Mexico.
Historic fuel consumption	lts/year	National Chamber for Sugar and Alcohol Industries (2005), Desarrollo Agroindustrial Azucarero 1999-2005, Mexico.
Programmed sugar crushed	tonnes/year	Project Developer
Programmed fuel consumption	lts/year	Project Developer
Heavy oil density	kg/lt	Project Developer
Net Calorific Value	TJ/kilotonne	IPCC (1996) Guidelines dor National Greenhouse Gas Inventories, 1996 Workbook.
Emission Coefficient	tCO2/TJ	IPCC (1996) Guidelines dor National Greenhouse Gas Inventories, 1996 Workbook.

B.3. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered small-scale CDM project activity:

>>
The Project qualifies to use the simplified procedures (including the additionality tool described in attachment A to Appendix B). Accordingly, the description below indicates how additionality has been demonstrated for the Project.

The Project will result in reduction of greenhouse gases that would not occur if the project were not implemented. The numerous barriers and risks associated with the implementation of the Project identified below clearly demonstrate that this project activity is not the business as usual scenario.

Commercial barriers: The Mexican sugar industry faces severe commercial barriers; as international prices decrease, increasing domestic costs and reductions in sales volume are negatively impacting the cash flows of the mills.

First, prices have decreased as a result of the price cap for sugar on the domestic market, the increasing competition of corn-based sweeteners, and the increasing imports of cheaper sugar from the US

Second, production costs increase every year. For example, sugarcane, labour and fuel costs increased 7, 11 and 19 percent respectively for the 2005-2006 sugar season. In this sense, sugarcane represents 60% of the overall costs.[1] "The Mexican sugarcane price is higher than the U.S. price; almost double the price in Guatemala and three times the price of Brazilian sugarcane."[2]

Finally, sales volumes of Mexican sugar have decreased as a consequence of low competitiveness with the US market, and a growing share of nationally produced or imported corn syrup in Mexico.[3] This situation has lead the sugar industry to experience negative cash flows, increasing the difficulties for investment and the risk of any investment made.

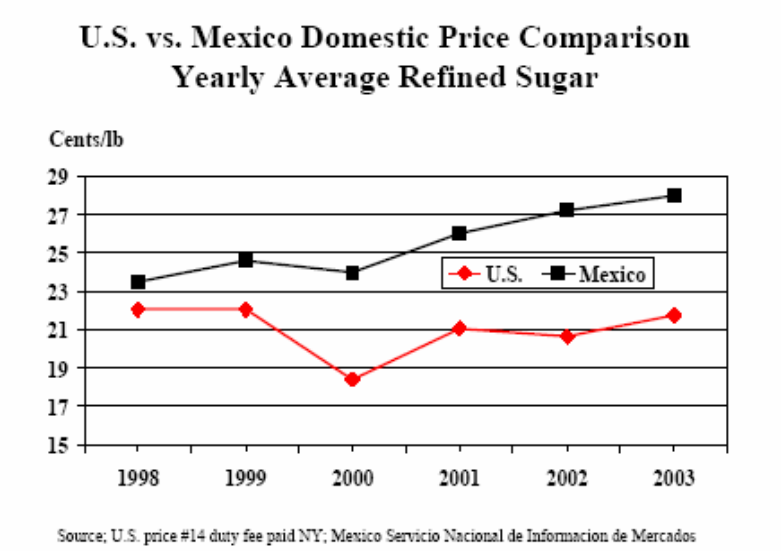

Figure B.3.1. US vs. Mexico Domestic Price Comparison. Source: (Knapp, 2004)

[1] Angeles (2005), Sugar Industry Situation, Agriculture Commission, Mexico.
[2] Knapp (2004), Robert Knapp Horticultural and Tropical Products Division Foreign Agricultural Service, USDA.
[3] Angeles (2005), Sugar Industry Situation, Agriculture Commission, Mexico.

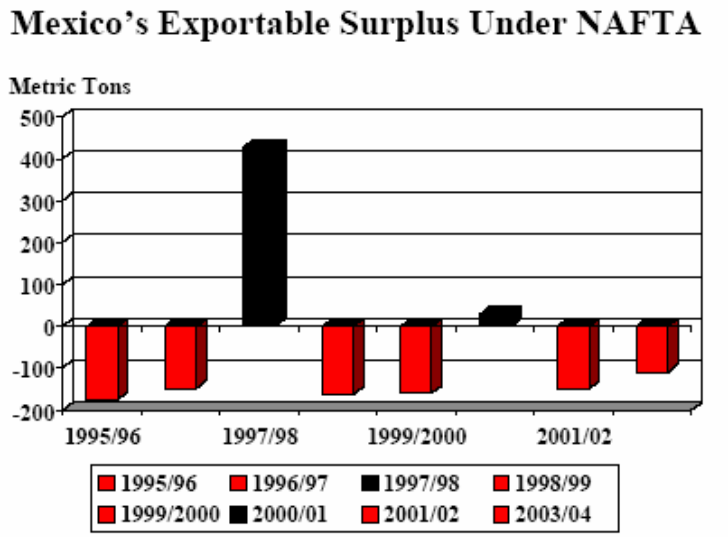

Figure B.3.2. Mexico's Exportable Surplus Under NAFTA. Source: (Knapp, 2004)

Barriers due to prevailing practice: The "Law for Sustainable Development of the Mexican Sugar Industry" considers the payment of sugar cane to growers not only based on the sugar produced, but also on all the by-products of the sugar cane. In this sense, regardless of the efforts made by the companies to become more competitive and diversify their activities (e.g. by producing ethanol or power through cogeneration activities), this law increases the costs of alternative activities, reducing the expected financial returns and consequently their financial attractiveness.[4]

Institutional Barriers: The Project faces institutional barriers related to the commercial situation and structure of the sugar industry in Mexico:

First, there are the commercial and institutional uncertainties faced by the sugar industry in Mexico. The relationship between the sugar companies and sugar growers has been punctuated by yearly disputes, triggered by sugarcane's price establishment. In solving such differences sugar growers usually undertake strikes and takeover the mills before the harvesting season begins. Such a situation represents a constant risk to all sugar mills, increasing the investment risk within the sector.

Second, the importance of the sugar industry to Mexico's economic well-being entails ever-present risk of governmental intervention. "Over the last 40 years the Mexican sugar industry has experienced a progression of government interventions… resulting in bankruptcy and technological stagnation"[5].This produces a risky environment for investment as government could expropriate the mills if the industry experiences tight commercial situation that puts employment at risk.

[4] Sagarpa (2005), Ley de Desarrollo Sustentable de la Caña de Azucar, Mexico.
[5] Knapp (2004), Robert Knapp Horticultural and Tropical Products Division Foreign Agricultural Service, USDA.

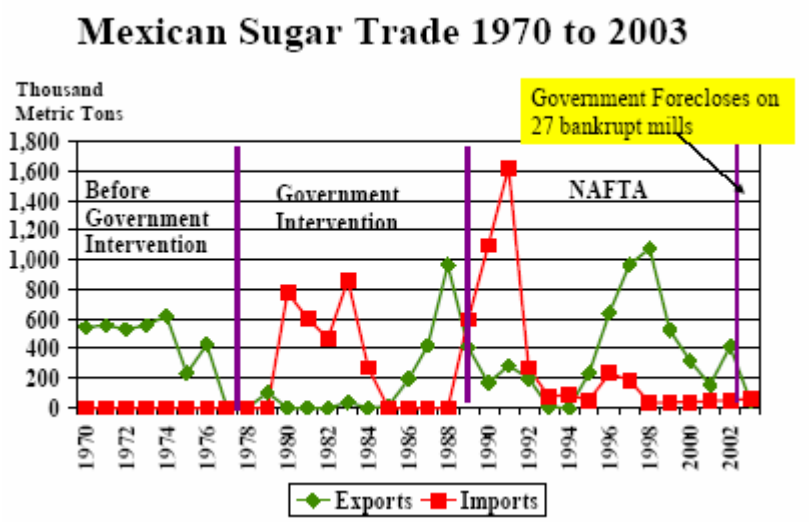

Figure B.3.3. Mexican Sugar Trade 1970 to 2003. Source: (Knapp, 2004)

The Project complies with all applicable legal and regulatory requirements of Mexico. Moreover, energy efficiency improvement activities in sugar mills are not compulsory under any law. It is expected to remain this way in the future.

The CDM Impact

The CDM revenue expected for the Project has been one of the key issues that encouraged the project developer to undertake the proposed project activity. The impact of approval and registration of the Project as a CDM activity will bring accountable and non-accountable benefits to the project developer, the sugar industry and the Host Country.

For the project developer, it represents extra income that will contribute with the improvement of its cash flow, while reducing its fuel-related costs and increasing the overall thermal efficiency. It will also improve the image of company as environmental and social responsible company, and alleviate the commercial, investment and institutional hurdles showed previously.

The registration of the project activity will also benefit the sugar industry and the Host Country. It will contribute on the isolation of the sector's economy from the fluctuations on price of oil, promoting a healthier and more efficient industry. The latter, will reduce the risks bankruptcy and loss of employment with in the sector.

B.4. Description of how the definition of the project boundary related to the baseline methodology selected is applied to the small-scale project activity:

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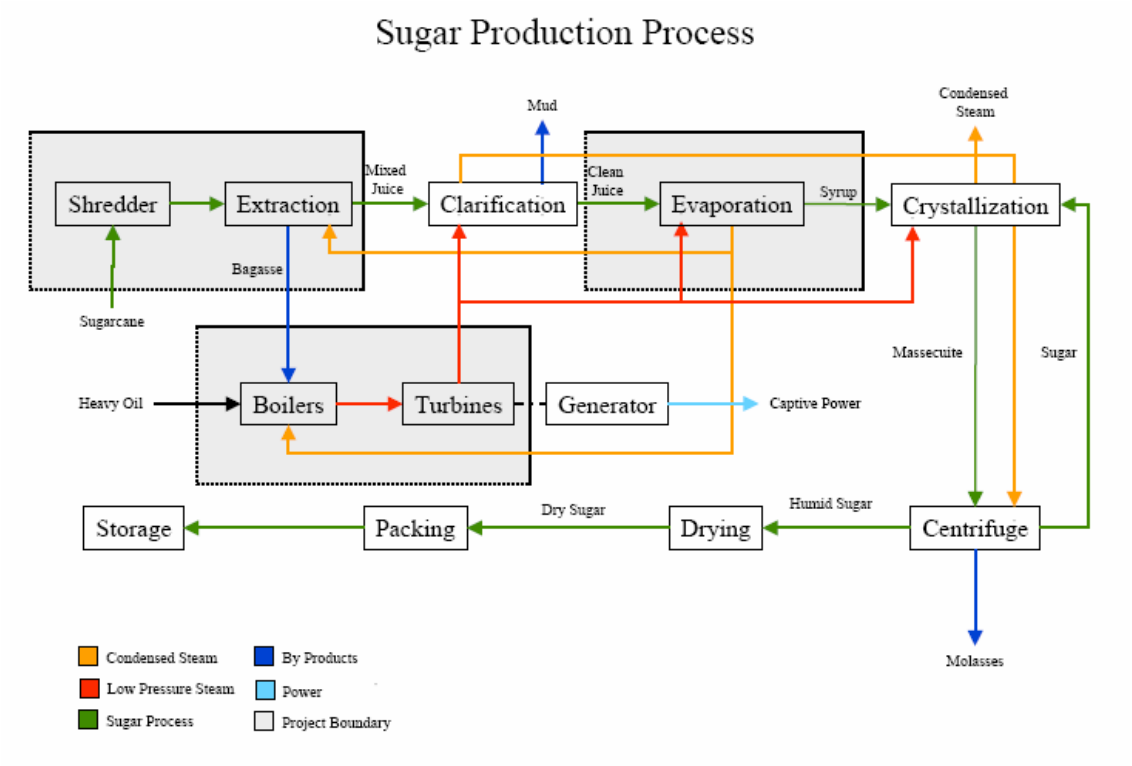

Figure B.4.1. Project Boundary. Source: Modified from developer data

B.5. Details of the baseline and its development:

>>

Based on the applicable methodology (AMS II.D Energy efficiency and fuel switching measures for industrial facilities), the baseline consists of the aggregated energy use of the existing equipment that will be replaced by the retrofitting and new equipment installation measures. This is considered in the Project according to this formula:

$$BE_y = \sum_i F_{i,y} \cdot COEF_i$$

where:

BEy represents baseline emissions from combustion of fossil fuels related to the operation of the facility in tons of CO_2.

$F_{i,y}$ is the fuel consumption of fuel type *i* during the year *y*, and

$COEF_i$ is the CO_2 emission factor coefficient of the fuel type *i*.

The baseline study was concluded on November 28, 2005. The entity determining the baseline and participating in the project as the Carbon Advisor is EcoSecurities Ltd., listed in Annex 1 of this document.

SECTION C. Duration of the project activity / Crediting period:

C.1. Duration of the small-scale project activity:

>>

C.1.1. Starting date of the small-scale project activity:

>>
12/5/2005

C.1.2. Expected operational lifetime of the small-scale project activity:

>>
The expected operational life-time of the project activity is 21 (twenty-one) years.

C.2. Choice of crediting period and related information:

>>

C.2.1. Renewable crediting period:

>>

C.2.1.1. Starting date of the first crediting period:

>>
24/4/2006

C.2.1.2. Length of the first crediting period:

>>
7 (seven) years

C.2.2. Fixed crediting period:

>>
Not applicable

C.2.2.1. Starting date:

>>
Not applicable

C.2.2.2. Length:

>>
Not applicable

SECTION D. Application of a monitoring methodology and plan:

>>

D.1. Name and reference of approved monitoring methodology applied to the small-scale project activity:

>>

AMS II.D "Energy efficiency and fuel switching measures for industrial facilities".

D.2. Justification of the choice of the methodology and why it is applicable to the small-scale project activity:

>>

The proposed project activity meets all the applicability requirements, as stated in Section B.3. The chosen monitoring methodology is therefore to be used in conjunction with baseline methodology AMS II.D.

D.3 Data to be monitored:

>>

D.2.1.3. Relevant data necessary for determining the baseline of anthropogenic emissions by sources of GHGs within the project boundary and how such data will be collected and archived :

ID number	Data Type	Data Source	Data Variable	Data unit	Measured (m) calculated (c) estimated (e)	Recording frequency	Comments
1.Esp		Equipment Supplier	Specifications of the equipment replaced		m	When equipment is replaced	Only applies in case of retrofit measures
2.EU		Project Developer	Energy used by the industrial process	Lt fossil fuel/ton of sugarcane crashed	c	daily	Applies for all processes affected by the project activity
3.ES		Project Developer	Energy saved by the project activity	Lt fossil fuel/ton of sugarcane crashed	c	daily	Applies for all processes affected by the project activity
4.SCy		Project Developer	Sugar cane crushed during a day	tonnes/day	m	daily	

D.4. Qualitative explanation of how quality control (QC) and quality assurance (QA) procedures are undertaken:

>>
Not applicable

D.5. Please describe briefly the operational and management structure that the project participant(s) will implement in order to monitor emission reductions and any leakage effects generated by the project activity:

>>
The Laboratory of the sugar mill already gets daily data from different departments along the sugar production process. For emission reductions monitoring purposes, data will be obtained and actual emission reductions estimated on this Laboratory.

D.6. Name of person/entity determining the monitoring methodology:

>>
The baseline study was concluded on November 3 2005. The entity determining the baseline and participating in the project as the Carbon Advisor is EcoSecurities Ltd., UK, listed in Annex 1 of this document.

SECTION E.: Estimation of GHG emissions by sources:

E.1. Formulae used:

>>

E.1.1 Selected formulae as provided in appendix B:

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The baseline emissions (BE_y) resulting from the combustion of fossil fuels, related to the operation of the facility are:

$$BE_y = \sum_i F_{i,y} \cdot COEF_i$$

where

BEy are the baseline emissions from the combustion of fossil fuels related to the operation of the facility in tons of CO_2.,
$F_{i,y}$ is the fuel consumption of fuel type *i* during the year *y* and
$COEF_i$ is the CO_2 emission factor coefficient of the fuel type *i*.

For the proposed project activity:

BE_1= 1.626 kilotonnes/year * 3209 tCO2e/kilotonne = 5221 tCO2e/year
BE_2= 1.842 kilotonnes/year * 3209tCO2e/kilotonne = 5913 tCO2e/year
BE_3= 2.00 kilotonnes/year * 3209 tCO2e/kilotonne = 6433 tCO2e/year
BE_4= 2.151 kilotonnes/year * 3209 tCO2e/kilotonne = 6903 tCO2e/year
BE_{5-7}= 2.202 kilotonnes/year * 3209 tCO2e/kilotonne = 7068 tCO2e/year

The project activity emissions (PE_y) resulting from the combustion of fossil fuels, related to the operation of the Project are:

$$PE_y = \sum_i F_{i,y} \cdot COEF_i$$

where

PEy are the emissions from combustion of fossil fuels related to the project activity in tons of CO_2,
$F_{i,y}$ is the fuel consumption of fuel type *i* during the year *y*, and
$COEF_i$ is the CO_2 emission factor coefficient of the fuel type *i*.

For the proposed project activity:

PE_1= 0.242 kilotonnes/year * 3209 tCO2e/kilotonne = 776 tCO2e/year
PE_{2-7}= 0 kilotonnes/year * 3209 tCO2e/kilotonne = 0 tCO2e/year

Therefore the emission reductions of the Project are:

$$ER_y = BE_y - PE_y$$

For the proposed project activity:

ER_1= 1.384 kilotonnes/year * 3209 tCO2e/kilotonne = 4445 tCO2e/year
ER_2= 1.842 kilotonnes/year * 3209 tCO2e/kilotonne = 5913 tCO2e/year
ER_3= 2.004 kilotonnes/year * 3209 tCO2e/kilotonne = 6433 tCO2e/year
ER_4= 2.151 kilotonnes/year * 3209 tCO2e/kilotonne = 6903 tCO2e/year
ER_5= 2.202 kilotonnes/year * 3209 tCO2e/kilotonne = 7068 tCO2e/year

E.1.2 Description of formulae when not provided in appendix B:

>>

E.1.2.1 Describe the formulae used to estimate anthropogenic emissions by sources of GHGs due to the project activity within the project boundary:

>>
Not applicable

E.1.2.2 Describe the formulae used to estimate leakage due to the project activity , where required, for the applicable project category in appendix B of the simplified modalities and procedures for small-scale CDM project activities.

>>
Not applicable

E.1.2.3 The sum of E.1.2.1 and E.1.2.2 represents the small-scale project activity emissions:

>>
Not applicable

E.1.2.4 Describe the formulae used to estimate the anthropogenic emissions by sources of GHGs in the baseline using the baseline methodology for the applicable project category in appendix B of the simplified modalities and procedures for small-scale CDM project activities:

>>
Not applicable

E.1.2.5 Difference between E.1.2.4 and E.1.2.3 represents the emission reductions due to the project activity during a given period:

>>
Not applicable

E.2 Table providing values obtained when applying formulae above:

>>

Baseline Scenario							
	y	SC_y		$F_{i,y}$			BE_y
Crediting Period	Year	Sugarcane crushed (t)	Fuel Oil Consumption (l/t cane)	Quantity (lt)	Quantity (kilotonnes)	Energy supplied (TJ)	Emission (tCO_2e)
0	2004-2005	287,972.00	1,935,388.00	6.72	1.65	71.28	5,279
1	2005-2006	284,810.00	1,913,923.20	6.72	1.63	70.49	5,221
2	2006-2007	322,562.00	2,167,616.64	6.72	1.84	79.83	5,913
3	2007-2008	350,938.00	2,358,303.36	6.72	2.00	86.86	6,433
4	2008-2009	376,578.00	2,530,604.16	6.72	2.15	93.20	6,903
5	2009-2010	385,568.00	2,591,016.96	6.72	2.20	95.43	7,068
6	2010-2011	385,568.00	2,591,016.96	6.72	2.20	95.43	7,068
7	2011-2012	385,568.00	2,591,016.96	6.72	2.20	95.43	7,068
Project Scenario							
	y	SC_y		$F_{i,y}$			PE_y
Crediting Period	Year	Sugarcane crushed (t)	Fuel Oil Consumption (l/t cane)	Quantity (lt)	Quantity (kilotonnes)	Energy supplied (TJ)	Emission (tCO_2e)
1	2005-2006	284,810.00	1.00	284,810.00	0.24	10.49	776
2	2006-2007	322,562.00	0.00	0.00	0.00	0.00	0.00
3	2007-2008	350,938.00	0.00	0.00	0.00	0.00	0.00
4	2008-2009	376,578.00	0.00	0.00	0.00	0.00	0.00
5	2009-2010	385,568.00	0.00	0.00	0.00	0.00	0.00
6	2010-2011	385,568.00	0.00	0.00	0.00	0.00	0.00
7	2011-2012	385,568.00	0.00	0.00	0.00	0.00	0.00

Reductions							
	y	SC_y		$F_{i,y}$			ER_y
Crediting Period	Year	Sugarcane crushed (t)	Fuel Oil Consumption (l/t cane)	Quantity (lt)	Quantity (kilotonnes)	Energy Saved (TJ)	**Emission (tCO_2e)**
1	2005-2006	0.00	1,629,113.20	5.72	1.38	60.00	**4,445**
2	2006-2007	0.00	2,167,616.64	6.72	1.84	79.83	**5,913**
3	2007-2008	0.00	2,358,303.36	6.72	2.00	86.86	**6,433**
4	2008-2009	0.00	2,530,604.16	6.72	2.15	93.20	**6,903**
5	2009-2010	0.00	2,591,016.96	6.72	2.20	95.43	**7,068**
6	2010-2011	0.00	2,591,016.96	6.72	2.20	95.43	**7,068**
7	2011-2012	0.00	2,591,016.96	6.72	2.20	95.43	**7,068**

SECTION F.: Environmental impacts:

F.1. If required by the host Party, documentation on the analysis of the environmental impacts of the project activity:

>>
According 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.

SECTION G. Stakeholders' comments:

G.1. Brief description of how comments by local stakeholders have been invited and compiled:

>>
The consultation event allowed stakeholders to understand the basic concepts related to climate change and the Kyoto Protocol and its consequences, as well the most important features of the project undertaken by Lazaro Cardenas Mill.

The event was held in Taretan City on November 22nd, 2005. In total 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. All participants were registered with appropriate formats kept in the company's files. The event was also advertised in the main local newspaper.

The event was held in a meeting room where Lazaro Cardenas Mill's Project Managers gave a presentation on climate change issues. They explained the Clean Development Mechanism and the main features and impacts of the Project. This was followed by a discussion to collect the stakeholders' opinions and comments.

URUAPAN, MICH., MARTES 22 DE NOVIEMBRE DE 2005

La Opinión de Michoacán

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INGENIO LAZARO CARDENAS, S.A. DE C.V.

HACE UNA CORDIAL INVITACION A LA COMUNIDAD A PARTICIPAR EN EL EVENTO INFORMATIVO DE LAS ACCIONES ENCAMINADAS A DISMINUIR, PREVENIR Y CONTROLAR LA CONTAMINACION EN LA ZONA DE INFLUENCIA DEL INGENIO, EN CUMPLIMIENTO A LAS DISPOSICIONES CONTENIDAS EN EL PROTOCOLO DE KYOTO, DEL CUAL MEXICO ES INTEGRANTE.

DICHO EVENTO SE LLEVARA A CABO EN LA SALA DE CONFERENCIAS DEL INGENIO, EL PROXIMO MIERCOLES 23 DE NOVIEMBRE DE 2005 A PARTIR DE LAS 10:00 A.M. SE RECOMIENDA LA ASISTENCIA PUES ES IMPORTANTE CONOCER LAS ESTRATEGIAS QUE SE HAN ADOPTADO PARA MEJORAR LA CALIDAD DE VIDA DE LA COMUNIDAD. ¡SUMATE A NUESTRO ESFUERZO!

ATENTAMENTE

ING. J. ALEJANDRO GUEVARA ALBA
GERENTE GENERAL

G.2. Summary of the comments received:

>>

During the public consultation stakeholders raised questions and provided comments regarding the following issues:

1. During the harvesting season large amount of pesticides are used. Moreover, after the sugarcane is harvested leftovers are burned to clean the land. This produces smoke that may cause respiratory deceases among the local population.

2. The participants showed concern about the emissions produced by the mill due to the burning of bagasse for steam generation during the harvesting season. These emissions may also cause respiratory deceases among the population.

3. Members of the community showed concern about the pollution discharges to the water and wanted to know the actual situation on this issue.

4. Although stakeholders recognize the positive environmental impacts of the Project, comments were raised regarding the extent to which these efficiency and automation processes will impact the employment currently provided by the mill.

Moreover, members of the community expressed their satisfaction with the Clean Development Mechanism as a tool for promoting pollution abatement at the local level. Similarly, they congratulated the Lazaro Cardenas mill for the event which helped to inform the community about its operations.

G.3. Report on how due account was taken of any comments received:

>>

Regarding the comments mentioned above:

1. The sugar growers' representative committed himself on behalf of the sugar growers to take any possible action to reduce air pollution from the sugarcane harvesting.

2. Lazaro Cardenas Mill's staff explained that filters have been installed in the chimneys of the boilers to avoid particle and sulphur oxide emissions, which may impact the health of the population.

3. Lazaro Cardenas Mill's staff explained that the installation of a cooler tower reduced the water consumption during the operation from 3,500,000 m3 to only 297,000 m3. Moreover, it was explained that water discharges during the operation season comply with the norm NOM-001-ECOL-96.

4. Lazaro Cardenas Mill's staff explained that these improvements are necessary for the survival of Lazaro Cardenas Mill as the Mexican sugar industry faces greater competitors and commercial challenges every year. The mill is committed to minimizing the negative impact on employment opportunities.

Annex 1

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Annex 2

INFORMATION REGARDING PUBLIC FUNDING

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