



VALIDATION REPORT

INGENIO MAGDALENA S.A. COGENERATION PROJECT IN GUATEMALA

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DET NORSKE VERITAS



VALIDATION REPORT

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Client: Ingenio Magdalena S.A.	Client ref.: Luna, Pablo Pedro

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Summary:

Det Norske Veritas Certification AS (DNV) has performed a validation of the Ingenio Magdalena S.A. Cogeneration Project in Guatemala 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 and the subsequent decisions by the CDM Executive Board.

The validation consisted of the following three phases: i) a desk review of the project design documents, 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 12 March 2007, meets all relevant UNFCCC requirements for the CDM and correctly applies the approved baseline and monitoring methodology ACM0006 - version 04. Hence, DNV will request the registration of the Ingenio Magdalena S.A. Cogeneration Project as a CDM project.

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Abbreviations

AMM	Administrador de Mercado Mayorista (Guatemala's Electricity Spot Market Administrator)
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM EB	Executive Board of the Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CH ₄	Methane
CL	Clarification request
CNEE	National Electrical Energy Company
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
DNV	Det Norske Veritas
DNA	Designated National Authority
ENEE	Empresa Nacional de Energía Eléctrica (National Electric Energy Company)
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Plan
MVP	Monitoring and Verification Plan
NGO	Non-governmental Organisation
ODA	Official Development Assistance
PDD	Project Design Document
PPA	Purchase Power Agreement
MARN	Ministerio de Ambiente y Recursos Naturales de Guatemala (Ministry of Environment and Natural Resources)
UNFCCC	United Nations Framework Convention on Climate Change



1 INTRODUCTION

Ingenio Magdalena S.A. has commissioned Det Norske Veritas Certification AS. (DNV) to perform a validation of the Ingenio Magdalena S.A. Cogeneration Project (also called as “MAGDALENA project”) located in the city of La Demeocracia, Department of Escuintla, Guatemala.

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:

Mr Luis Filipe Tavares	DNV Rio de Janeiro	CDM validator, Team leader
Mr Marco A. Ratton	DNV Rio de Janeiro	GHG auditor
Mr. Michael Lehman	DNV Oslo	Sector Expert
Mr. Miguel Rescalvo	DNV Oslo	Technical reviewer (acting)
Mr Einar Telnes	DNV Oslo	Technical reviewer

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 and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodology ACM0006, version 04. The validation team has, based on the recommendations in the Validation and Verification Manual /14/ 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 Ingenio Magdalena S.A. Cogeneration Project

The Ingenio Magdalena S.A. Cogeneration Project proposes to increase the efficiency in the production of electricity from bagasse, a by-product during production of sugar. The power generation capacity at the Magdalena sugar mill will be increased through the



installation of higher efficiency boilers and turbo-generators. The project is already implemented and its starting date was 19 February 2004.

The estimated amount of GHG emission reductions from the project is calculated to be 1 010 448 tCO₂e during the selected first 7-year crediting period (with the potential of being renewed twice), resulting in estimated average annual emission reductions of 144 350 tCO₂e.

2 METHODOLOGY

The validation consisted of the following three phases:

- i) a desk review of the project design documentation;
- 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 /14/. The protocol shows, in a transparent manner, criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

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

The validation protocol consists of three tables. The different columns in these tables are described in Figure 1.

The completed validation protocol for the Ingenio Magdalena S.A. Cogeneration Project is enclosed in Appendix A to this report.

Findings established during the validation are seen as either a non-fulfilment of validation 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) CDM or host Party 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* (CL) is 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 initial PDD (version 01 of 20 October 2005) submitted by Ingenio Magdalena S.A. and Ecoinvest Carbon S.A. was assessed by DNV. However, this PDD was based on the baseline and monitoring methodology AM0015 which on 28 November 2005 was replaced by the consolidated baseline and monitoring methodology ACM0006. Hence, a revised version of the PDD applying ACM0006 (Version 02 of 31 June 2006), applying ACM0006 (Version 3 of 19 May 2006) was submitted by the client and subsequently assessed by DNV. Due to the approval of the version 04 of the ACM0006 methodology a further revised PDD (version 3 of 08 December 2003) was submitted by Ingenio Magdalena S.A. and Ecoinvest Carbon S.A. Finally, due to the introduction of a new template for writing PDDs (Version 3.1) by the CDM Executive Board (CDM EB) and in order to address other remaining outstanding issues raised by DNV during the validation process, a final version of the PDD was submitted (Version 4 of 12 March 2007) /1/. This was the PDD version assessed and revised by DNV for the compilation of this final validation report.

In addition to the PDD, spreadsheets containing detailed calculations for the combined margin emission coefficient /2/, project's investment analysis (IRR calculation) /3/ and CERs calculations /4/ were assessed as a part of the validation. Besides such documents, in order to ensure the accuracy of all relevant information, other documents were sent by Ingenio Magdalena S.A. and Ecoinvest Carbon S.A. and assessed by DNV both during the phases of desk review and resolution of outstanding issues. Such documents and references include: evidence of project starting date /5/, evidence that incentive from the CDM was considered in the decision to proceed with the project activity /6/, Letter of Approval issued by the Designated National Authority (DNA) of Guatemala /7/, environmental licenses /8/, evidence of equipment life time (reference to technical literature) /9/ and evidences that local stakeholders were invited for comments /10/ /11/. These documents, among others, are listed in the section "References" below.

Other assessed documents are listed in the section "References" below.

2.2 Follow-up Interviews

In August 2006, February 2007 and March 2007 representatives from Ecoinvest Carbon S.A. (on behalf of Ingenio Magdalena S.A.) were contacted in order to confirm and to resolve issues identified in the document review. The main topics of the interviews were:

- Environment licenses compliance,
- Local Stakeholders consultation process,
- Additionality of the project,
- Cash flow analysis and IRR,
- Baseline emission assessment and calculations,
- Calibration requirements,
- Monitoring records and QA/QC procedures.

2.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation was to resolve any outstanding issues, which needed to be clarified for DNV's positive conclusion on the project design.



The initial validation of the project identified some *corrective action requests* and requests for *clarification*. The project participant's responses to the findings presented in DNV's draft validation report were resolved during communications between the project participants and DNV leading to the issuance of different revisions of the PDD. The latest versions of the PDD successfully addressed all the *corrective action requests* and requests for *clarification* to DNV's satisfaction and incorporated the requirements of the latest version of the applied methodology and the latest template for writing PDDs.

To guarantee the transparency of the validation process, the concerns raised and the response provided by the project participants are documented in more detail in the validation protocol in Appendix A.

2.4 Internal Quality Control

The draft validation report including the initial validation findings underwent a technical review before being submitted to the project participants. The final validation report underwent another technical review before requesting registration of the project activity. The technical review was performed by a technical reviewer qualified in accordance with DNV's qualification scheme for CDM validation and verification.

3 VALIDATION FINDINGS

The findings of the validation of the Ingenio Magdalena S.A. Cogeneration Project 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 of 12 March 2007 /1/

3.1 Participation Requirements

The project participant is Ingenio Magdalena S.A. of Guatemala. The Host Party Guatemala meets all relevant participation requirements and has provided written approval of voluntary participation in the project. The Ingenio Magdalena S.A. Cogeneration Project received the Letter of Approval from the DNA of Guatemala (dated 21 December 2005).

The project is expected to bring social (employment), and economic benefits, thus contributing to the sustainable development objectives of the Guatemalan Government. The DNA of Guatemala confirmed the project contribution to the sustainable development of the country /7/.

The project does not involve any public funding and the validation did not reveal any information that indicates that the project can be seen as a diversion of ODA funding towards Guatemala.

3.2 Project Design

The project is a grid-connected renewable energy project activity, displacing grid electricity with electricity generated from renewable sources (bagasse) and thus resulting



in the reduction of emissions of greenhouse gases in the energy sector. The project aims to increase the efficiency of the prevailing bagasse based energy generation, by installing new boilers and turbo generators.

This project activity is proposed to be implemented in four phases. Phase one was implemented in 2005 with the installation of a 825 Psig boiler and a 16.5 MW condensing turbo generator. The second phase was implemented in 2006 with the installation of a 900Psig boiler and a 30 MW back pressure turbo-generator. The third stage is to be completed by the end of 2007 and it will consist of the installation of an additional 900 Psig boiler and a 35 MW back pressure turbo-generator. The fourth stage will consist of the installation of a 45 MW back pressure turbo-generator. The old turbo generators and boilers will be kept as a stand-by option in order to support the production in case the sugar production increases beyond the foreseen levels. The final installed capacity (not considering the equipment in stand-by) after the completion of the four phases will be 126.5 MW. Together, the implementation of the four project phases corresponds to a total capacity increase of 73 MW.

Ingenio Magdalena S.A. holds a Power Purchase Agreement Agreement (PPA) for delivering the electricity to the Guatemalan grid.

The project design engineering reflects good practice through the use of Rankine steam cycle technology for steam rising and power generation.

A 7-year renewable crediting period is selected (with the potential of being renewed twice), starting on 1 March 2005. The starting date of the project activity is 19 February 2004. The expected operational lifetime of the project is 25 years.

3.3 Project Baseline

The project applies the approved consolidated baseline methodology ACM0006, version 04, "*Consolidated baseline methodology for grid-connected electricity generation from biomass residues*" /15/ in combination with ACM0002 version 06 "*Consolidated baseline methodology for grid-connected electricity generation from renewable sources*".

This methodology is applicable to the Ingenio Magdalena S.A. Cogeneration Project as this project consists of the improvement of the energy efficiency of an existing power generation plant for supplying electricity to the Guatemalan grid. The project meets the applicability conditions of ACM0006 as:

- i) only bagasse is used in the cogeneration plant;
- ii) it has been justified that the increase in sugar production is not attributed to the CDM project activity but to the normal development of the sugar mill's business;
- iii) only small quantities of bagasse are stored from one season to another (always less than one year) and
- iv) the bagasse do not require any preparation before being used as fuel.

Project boundaries are defined as: 1) Baseline energy grid: the Guatemalan grid and 2) Baseline cogeneration plant: the whole site where the cogeneration facility (Ingenio Magdalena S.A.) is located.

Baseline scenario 14 of ACM0006 has been selected and is justified as follows:



Power generation: in the baseline scenario the electricity would have been generated in existing and/or new grid connected power plants (P4) and some electricity would have been generated in the existing power plant (P5).

Heat generation: the baseline scenario is the continuation of heat generation in an existing cogeneration plant, fired with the same type of biomass (bagasse) (H5).

For biomass use: In the baseline scenario the biomass would have been used for heat and/or electricity generation at the project site (B4).

The baseline scenario for power and heat generation assumes the project activity would have been implemented, not undertaken as a CDM project activity, at the end of the lifetime of the existing plant. Due to the seasonal characteristics of the sugar production and the maintenance practices it can be assumed a lifetime over 50 years for the boilers. This has been confirmed by related technical literature /9/. At Ingenio Magdalena S.A., old boilers were installed at different dates from 1981 to 1999, while the old turbo generators were installed at different dates from 1998 to 2001. Hence, the remaining lifetime for the installed equipment before the project activity is justified to be extended after the end of the crediting period.

It has been demonstrated that the verified increase in the thermal firing capacity in the project scenario would have also occurred in the baseline scenario due to the increase in sugar demand (thus increasing the thermal demand in the baseline configuration). This is demonstrated by documentation of Ingenio Magdalena S.A. strategic plan and sugar production forecasts in 2002 /13/, which considers an expansion in the company's sugar-cane capacity from 2 600 000 tonnes in harvest 2002-2003, to 4,000,000 tones, in harvest 2006-2007. Hence, the increase is not attributed to the CDM project activity but to the normal development of the sugar mill's business. It can be concluded that the project activity does not increase the generation of thermal energy (steam) and that the increase in the bagasse use and thermal energy generation would have also occurred in the absence of the project.

3.4 Additionality

In accordance with ACM0006, the additionality of the project is demonstrated through the "Tool for the demonstration and assessment of additionality" /17/, which includes the following steps:

Step 0. Preliminary screening based on the starting date of the project activity: The project started on 19 February 2004. Evidence provided for this is the receipt of freight service of the new boiler to Ingenio Magdalena S.A. /5/. Evidence that Ingenio Magdalena S.A. seriously considered the CDM in the decision to proceed with the project is provided through the minute of a meeting held by the company Board /6/. Such meeting minutes, from 21 January 2003, refers to incentives of the CDM as a form of financing of the cogeneration project. Since the project requested validation prior to 31 December 2005 (version 01 of the PDD was published for comments in November 2005), the project thus may claim retroactive credits.



Step 1. Identification of alternatives to the project activity consistent with current laws and regulations: The possible scenarios are identified, i.e. i) baseline scenario: the generation of an equivalent amount of electricity by the generation mix of the Guatemalan electricity system; a system that continuously increases its dependency on thermal plants (using diesel and bunker) ii) project scenario: renewable thermal energy as a source of power. The provided alternatives are in compliance with the legal and regulatory requirements.

Step 2. Benchmark analysis: The project IRR has been verified /4/ to be 8.9% which is below the adopted benchmark IRR of 13.5%. The adopted benchmark is the average active rates for loans in local currency of Guatemalan Banks at the time the investment decision was made. The project involves an investment above 20 millions USD in four phases. The electricity tariff is from the PPA. As part of the financial analysis, a sensitivity analysis has been performed by increasing the energy prices in 10% and also by decreasing the operational costs in 10%. In the best case the IRR reaches 13.0%. Hence, it can be concluded that the project is not financially attractive under normal financial conditions.

Step 3: Barrier Analysis: Institutional, technological and logistic barriers as well as core business barrier are presented in the PDD:

Institutional Barrier: Although the government of Guatemala recently implemented some incentives to promote the development of renewable energy projects, the results had been very modest for power generation in the country. DNV assessed that such policy instruments do not yet represent effective incentives for electricity generation from renewable energy sources instead of fossil fuels. As a result, DNV concludes that the current regulatory and market frameworks for energy generation in Guatemala constitute a barrier for the promotion of renewable energy in the country. Thus this should be considered as a barrier for the implementation of the project.

Technological and logistic barriers: Rankine Cycle steam turbines and the electricity transfer equipment are not produced in Guatemala and need to be imported. Installation and service of such equipment is normally carried out by engineers and technicians from abroad. In addition since, the operating staff of the project proponent is not sufficiently skilled, extensive training for local staff on the operation of the new control equipment (also imported) is needed. DNV concludes that such aspects represent barriers that could be alleviated by the incentives of the CDM.

Core Business Barrier: The production of electricity to supply electricity to the grid is not the principal business of Ingenio Magdalena S.A. and supplementary knowledge needed to be acquired for this additional service provision.

Step 4. Common Practice Analysis: It has been argued that while cogeneration projects are wide spread among the sugar cane producers in Guatemala, the prevailing practice power is only for self consumption (to produce enough energy to maintain the companies independent from the grid) and to eliminate (burn) the bagasse, sugar-cane's byproduct. It should also be noted that, at the time that Ingenio Magdalena S.A. Cogeneration Project was initially submitted for validation, the only other cogeneration project in Guatemala supplying electricity to the national grid (San Diego Cogeneration Project) is also implemented as a CDM project.



Step 5. Impact of CDM registration: The project participants were able to demonstrate that the sale of CERs will provide the complementary incentives for the project to alleviate the above presented barriers.

Given the above, it is sufficiently demonstrated that the project is not a likely baseline scenario and that emission reductions are thus additional.

3.5 Monitoring Plan

The project applies the approved monitoring methodology ACM0006 - version 04 "Consolidated baseline methodology for grid-connected electricity generation from biomass residues" /15/.

Data to be monitored includes the net quantity of electricity generated at the project site, the net quantity of increased electricity generation as a result of the project activity, the average net efficiency of electricity generation, bunker oil used and its emission factor, the quantity of bagasse burned as well as its net calorific value (NCV).

The amount of electricity supplied to the grid is also monitored and the reliability of this monitoring parameter is assured through two-party verification of the amount of electricity that Ingenio Magdalena S.A. deliver to the grid.

The electricity data will be monitored by two meters at the project site and one meter owned by the local Energy Market Operator (*Administrador del Mercado Mayorista-AMM*). The amount of electricity will be corroborated with the invoices to be electrical company and in case of discrepancies, the later will prevail. The meters calibration is planned to be done annually. The NCV of the bagasse is planned to be measured every six months in line with the methodology.

The calibration of the monitoring instruments will be done according to the regulations of CNEE (National Electrical Energy Company). The plant has a distributed control system (DCS) which monitors, reports and records all relevant process variables and manages corrective actions.

Ingenio Magdalena S.A. is responsible for the project management and reporting project activities as well as organising and providing training to responsible staff on the appropriate monitoring, measurement and reporting processes.

There is a training program for the technical personnel regarding new equipment used in the sugar mill and in the power plant.

The data will be archived in electronic form and be kept for two years after the end of the last crediting period.

The monitoring plan is straightforward and no specific procedures beyond the established QA/QC procedures will be necessary. The established procedures reflect good monitoring and reporting practices.



3.6 Calculation of GHG Emissions

The emissions reduction is calculated as the net quantity of increased electricity generation by the project activity times an *ex-ante* determined emission factor for the Guatemalan electricity grid.

Project emissions are due to the consumption of bunker oil and are estimated to be on the average 15 364 tCO₂/year. Project emissions due to the biomass transportation do not occur.

According to scenario 14 of ACM0006 the most likely baseline scenario is the use of the biomass for energy generation and the diversion of biomass to the project activity is already considered in the calculation of baseline reductions. In this case, leakage effects do not need to be considered.

The thermal efficiency in the project plant is higher than in the baseline plant and thus, it is not necessary to account for emissions from this source.

According to ACM0006 scenario 14, the net quantity of increased electricity generation as a result of the project activity shall be determined as

follows:

$$EG_y = EG_{projectplant,y} * \left(1 - \frac{\varepsilon_{el,preproject}}{\varepsilon_{el,projectplant,y}} \right)$$

The average net efficiency of electricity generation in the project plant prior to project implementation ($\varepsilon_{el,pre project}$) is on the average 0.063 calculated *ex-ante* (average for the last three seasons prior to the start of the project) using the total electricity generated by the power plant and the amount of bagasse burned.

The estimated average net energy efficiency of electricity in the project plant ($\varepsilon_{el,project plant,y}$) is calculated by dividing the electricity generation during the year y by the amount of bagasse burned, expressed in energy units.

The bagasse NCV value adopted for the CER estimations is 2.58 MWh/tonnes. Such value was obtained from local measurements conducted at Ingenio Magdalena. This will be monitored every six month.

The system boundary for the grid electricity system affected by the project is defined as the system of the Guatemala grid. The combined margin emission coefficient for the grid is determined *ex-ante* in accordance with ACM0002 version 06. The calculations /2/ are based on electricity generation data provided by AMM for the electricity generated in the grid in the years 2003-2005. Data for the years 2003-2005 was the most recent statistics available at the time of PDD submission. Such data was verified against the data published on the AMM website.

As the Guatemalan electric grid has less than 50% of low-cost must run, the simple OM method was considered for the determination of the operating margin (OM). The build margin emission coefficient (BM) was calculated considering the most recent 20% power plants capacity additions (in MWh) in the electricity system. Both calculations considered electricity generated and fuel consumed based on data provided by AMM and evidenced in the baseline EF calculations /2/. The simple operating margin (OM) emission coefficient is



calculated to be 0.825 tCO₂e/MWh and the build margin (BM) emission coefficient is 0.584 tCO₂e/MWh, resulting in a combined margin emission coefficient of 0.705 tCO₂e/MWh (weighted average of the build and operating margin).

The estimated amount of GHG emission reductions from the project is calculated to be 1 010 048 tCO₂e during the selected first 7-year crediting period (with the potential of being renewed twice), resulting in estimated average annual emission reductions of 144 350 tCO₂e.

In summary, the GHG calculations are complete and transparent, and the data accuracy has been verified.

3.7 Environmental Impacts

Ingenio Magdalena S.A. obtained from Ministerio de Medio Ambiente y Recursos Naturales (Ministry of Environment and Natural Resources), two environmental license for operation of the different phases of the project. The first project phase, which included the installation of new turbo generator and boiler and resulted in an increase of generation capacity of 16.5 MW, was granted with Environmental License as Resolution No. 494-2004/MAGC/EM on 24 May 2004 /8/. The second project phase, which included the installation of a new turbo generator and resulted in an additional increase on generation capacity of 30 MW, was granted with Environmental License as Resolution No. 251-2005/MAGC/LL on 01 February 2005 /8/. All possible environmental impacts were analyzed, through a previously conducted Environmental Impact Assessment (EIA). The EIA included issues like use of resources, legislation to be observed, impacts to climate and air quality, geological and soil impacts, hydrological impacts (surface and groundwater), impacts to the flora and animal life, socio-economic (necessary infrastructure, legal and institutional, etc.), local stakeholders comments, mitigation measures and monitoring plan.

Complementarily, the PPA was signed with an additional condition of compliance with all the environmental regulation. It has been confirmed that the project itself does not required an environmental impact assessment.

The project design did not identify/address any adverse environmental impacts, which seems reasonable given the nature of the project design. Transboundary environmental impacts are not foreseen.

3.8 Comments by Local Stakeholders

As part of the process for obtaining the Environmental Licenses for the project phases, Ingenio Magdalena S.A. initially published in a national newspaper a call inviting stakeholders to make comments on the completed EIA (October 2003) /10/. Later, in another call for comments published in a national newspaper, Ingenio Magdalena S.A. invited stakeholders to make comments regarding the second phase of the project (November 2004) /10/. In addition to these public calls conducted as a part of the EIA, Ingenio Magdalena S.A. hired a private consultant to perform a survey among the surrounding communities on the impacts of the operation of Magdalena Cogeneration project. During the survey, such stakeholder were also invited to provide comments. Comments received during the survey were incorporated into the EIA report.



More recently, with a view to carrying out a more specific process focused on the CDM project Ingenio Magdalena S.A. sent letters informing local stakeholders that the cogeneration project project at Ingenio Magdalena is being undertaken as a CDM project and also inviting such stakeholder to provide related comments /11/. Letters were sent to the municipalities of La Democracia and Escuintla, and different departments of the Ministry of Environment and Natural Resources. No comments were received.

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

DNV published the PDD (Version 02 of 31 June 2006) on the DNV Climate Change web site (<http://www.dnv.com/certification/ClimateChange>) and Parties, stakeholders and NGOs were, through the UNFCCC CDM web site, invited to provide comments during the period from 02 August 2006 to 31 August 2006. No comments were received.

Prior to this, the PDD (version 01 of 20 October 2005) applying AM0015, was made publicly available on DNV's climate change website and Parties, stakeholders and NGOs were, through the CDM website, invited to provide comments during a 30 days period from 02 November 2005 to 01 December 2005. No comments were received in this earlier call.



5 VALIDATION OPINION

Det Norske Veritas Certification AS. (DNV) has performed a validation of the Ingenio Magdalena S.A. Cogeneration Project located in the city of La Demeocracia, Department of Escuintla, Guatemala. The validation was performed on the basis of UNFCCC criteria for CDM project activities and relevant Honduran criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The project participant is Ingenio Magdalena S.A. of Guatemala. The participating Host Party, Guatemala meets all relevant participation requirements and has provided written approval of voluntary participation in the project.

The Ingenio Magdalena S.A. Cogeneration Project received the Letters of Approval from the DNA of Guatemala (dated 21 December 2005). The DNA of Guatemala has confirmed that the project assists in achieving sustainable development. The project is presented as a unilateral project.

The project is a grid-connected renewable energy project activity, displacing grid electricity generated based on fossil fuels with electricity generated from renewable sources (bagasse) and thus resulting in the reduction of emissions of greenhouse gases in the energy sector. The project aims to increase the efficiency of the prevailing bagasse based energy generation by adding an additional 73 MW generation capacity, which will allow Ingenio Magdalena S.A. to generate excess electricity to be dispatched to the national grid.

The project applies the approved consolidated monitoring methodology ACM0006, version 04, "Consolidated baseline methodology for grid-connected electricity generation from biomass residues". The baseline methodology has been correctly applied and the assumptions made for the selected baseline scenario are sound. It is sufficiently demonstrated that the project is not a likely baseline scenario and that emission reductions attributable to the project are additional to any that would occur in the absence of the project activity.

The monitoring methodology is correctly applied. The monitoring plan sufficiently specifies the monitoring requirements of the main project indicators.

By displacing partly fossil fuel-based electricity with electricity generated from a renewable source, the project results in reductions of CO₂ emissions that are real, measurable and give long-term benefits to the mitigation of climate change. The annual average estimated emissions reduction is 144 350 tCO₂e/year during the first seven year crediting period starting on 1 March, 2005. Given that the project operates as designed, the project is likely to achieve the estimated amount of emission reductions.

Local stakeholder comments were invited during the environmental licensing phase of the project. No issues were raised.

Party, stakeholders and NGOs were invited to comment on the validation requirements via the UNFCCC web-site. No comments were received.

In summary, it is DNV's opinion that the Ingenio Magdalena S.A. Cogeneration Project, as described in the revised and resubmitted project design document of 12 March 2007, meets all relevant UNFCCC requirements for the CDM and correctly applies the approved baseline and monitoring methodology ACM0006 - version 04. Hence, DNV requests the registration of the Ingenio Magdalena S.A. Cogeneration Project as a CDM project.



REFERENCES

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

- /1/ Ingenio Magdalena S.A. and Ecoinvest Carbon S.A.: Project Design Document for the Ingenio Magdalena S.A. Cogeneration Project, version 4 of 12 March 2007.
- /2/ Ingenio Magdalena S.A. and Ecoinvest Carbon S.A.: Spreadsheet for calculation of Baseline Emission Factor (Guatemala baseline 2005.xls).
- /3/ Ingenio Magdalena S.A. and Ecoinvest Carbon S.A.: Spreadsheet of Calculation of Investment Analysis (Ecoinvest: Magdalena IRR 2007 03 12. xls)
- /4/ Ingenio Magdalena S.A. and Ecoinvest: Spreadsheet of Calculation of CERs (Magdalena_CERs_calculation_scenario14_2007 03 12.xls)
- /5/ Compañía de Logística y Transporte, S.A.: Receipt of service for freight of the new boiler to Ingenio Magdalena S.A. Receipt 10790 issued on 19 February 2004 (Magdalena_construction start evidence.doc)
- /6/ Ingenio Magdalena S.A.: Minute of the meeting held by the company's Board mentioning the potential incentives and benefits of the CDM as a form of financing of the project, 21 January 2003 (Magdalena CDM Evidence. tif)
- /7/ Ministerio de Ambiente y Recursos Naturales de Guatemala / Ministry of Environment and Natural Resources (DNA of Guatemala): Letter of Approval dated 21 December 2005.
- /8/ Ministerio de Ambiente y Recursos Naturales de Guatemala / Ministry of Environment and Natural Resources; Direccion General de Gestion Ambiental y Recursos Naturales:
 - Environmental License for operation of the phase 1 of the project. Resolution No. 494-2004/MAGC/EM, 24 May 2004 (Environmental License 16.5MW.doc).
 - Environmental License for operation of the phase 2 of the project . Resolution No. 251-2005/MAGC/LL, 01 February 2005 (Environmental License 30MW.doc).
- /9/ Technical literature:
 - Babcock & Wilcox Corporation. "Our boilers and environment equipment. (catalog);
 - Perez, G. L. "La remodelación de la caldera alemana de 25t/h". Energia, no. 5, pp. 14-27, 1985;
 - Foster Wheeler Corporation. "Heat engineering. CFB technology aids in redevelopment", 1999.



- /10/ Ingenio Magdalena S.A.:
 - Call for comments about the phase 1 of the cogenetation project; La Hora Newspaper, 15 October 2003 (Magdalena Stakeholders call 16 5 MW.doc)
 - Call for comments about the phase 2 of the cogenetation project; La Hora Newspaper, 2 November 2004 (Magdalena Stakeholders call 30 MW.doc)
- /11/ Ingenio Magdalena S.A. Letters to relevant local stakeholders which informs about the CDM project and call for comments:
 - Letter to the municipality of La Democracia, March 2007 (Magdalena_carta invita comentarios_alcalde Democracia.doc)
 - Letter to the municipality of Escuintla, March 2007 (Magdalena_carta invita comentarios_alcalde Escuintla.doc)
 - Letter to the Ministry of Environment and Natural Resources, March, 2007 (Magdalena_carta invita comentarios_Delegado MARN.doc)
 - Letter to the Ministry of Environment and Natural Resources. Oficina de MDL (DNA of Guatemala), March 2007 (Magdalena_carta invita comentarios_MMARN.doc)
- /12/ Conciencia Ambiental: Summary of stakeholder opinion for the cogeneration project of Ingenio Magdalena S.A. presented as part of the Environmental Impact Assessment, October, 2004. (Magdalena_local stakeholder comments.jpg)
- /13/ Ingenio Magdalena S.A.: Minutes of Shareholder Meeting with reference to company's strategic plan, 15 May 2002 (Magdalena Strategic Plan 2002.doc)

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

- /14/ International Emission Trading Association (IETA) & the World Bank's Prototype Carbon Fund (PCF): *Validation and Verification Manual*. <http://www.vvmanual.info>
- /15/ CDM-EB: Approved Consolidated Baseline and Monitoring Methodology ACM0006 - "Consolidated baseline methodology for grid-connected electricity generation from biomass residues", version 04.
- /16/ CDM-EB: Approved Consolidated Baseline and Monitoring Methodology ACM0002 - "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", version 06 of 19 May 2006.
- /17/ CDM Executive Board: Tool for the demonstration and assessment of additionality. Version 02 of 28 November 2005

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

- /18/ Ricardo Besen – Ecoinvest Carbon S.A.
 - /19/ Pedro Rachadel - Ecoinvest Carbon S.A.
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APPENDIX A

CDM VALIDATION PROTOCOL

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

Requirement	Reference	Conclusion	Cross Reference / Comment
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3	Kyoto Protocol Art.12.2	NA	Table 2, Section E.4.1 No participating Annex I Party is yet identified.
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, CDM Modalities and Procedures §40a	OK	Table 2, Section A.3 DNA of Guatemala: Letter of Approval dated 21 December 2005.
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, CDM Modalities and Procedures §40a	OK	DNA of Guatemala : Letter of Approval dated 21 December 2005.
5. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change	Kyoto Protocol Art. 12.5b	OK	Table 2, Section E
6. Reduction in GHG emissions shall be additional to any that would occur in absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity	Kyoto Protocol Art. 12.5c, CDM Modalities and Procedures §43	OK	Table 2, Section B.2
7. In case public funding from Parties included in Annex I 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.	Decision 17/CP.7, CDM Modalities and Procedures Appendix B, § 2	OK	The validation did not reveal any information that indicates that the project can be seen as a diversion of ODA funding towards Guatemala.
8. Parties participating in the CDM shall designate a national authority for the CDM	CDM Modalities and Procedures §29	OK	The DNA of Guatemala is the Ministry of Environment and Natural Resources (Ministerio de Ambiente y

Requirement	Reference	Conclusion	Cross Reference / Comment
			Recursos Naturales)
9. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol	CDM Modalities §30/31a	OK	Guatemala ratified the Kyoto Protocol on 05 October 1999.
10. The participating Annex I Party's assigned amount shall have been calculated and recorded	CDM Modalities and Procedures §31b	NA	No participating Annex I Party is yet identified.
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	NA	No participating Annex I Party is yet identified.
12. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received	CDM Modalities and Procedures §37b	OK	Table 2, Section G
13. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	CDM Modalities and Procedures §37c	OK	Table 2, Section F
14. Baseline and monitoring methodology shall be previously approved by the CDM Executive Board	CDM Modalities and Procedures §37e	OK	Table 2, Section B.1.1 and D.1.1
15. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP	CDM Modalities and Procedures §37f	OK	Table 2, Section D.
16. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available	CDM Modalities and Procedures §40	OK	The PDD was made publicly available on DNV's climate change website and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 02 October 2006 to 31 October 2006. No comments were received.

Requirement	Reference	Conclusion	Cross Reference / Comment
			Prior to this last PDD publication, the PDD (version 01 of 20 October 2005) applying AM0015, was also made publicly available on DNV's climate change website and Parties, stakeholders and NGOs were, through the CDM website, invited to provide comments during a 30 days period from 02 November 2005 to 01 December 2005. No comments were received in this earlier call either.
17. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances	CDM Modalities and Procedures §45c,d	OK	Table 2, Section B.2
18. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure	CDM Modalities and Procedures §47	OK	Table 2, Section B.2
19. The project design document shall be in conformance with the UNFCCC CDM-PDD format	CDM Modalities and Procedures Appendix B, EB Decision	OK	The PDD is in conformance with the UNFCCC CDM-PDD format.

Table 2 Requirements Checklist

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
A. General Description of Project Activity <i>The project design is assessed.</i>					
A.1. Project Boundaries <i>Project Boundaries are the limits and borders defining the GHG emission reduction project.</i>					
A.1.1. Are the project's spatial (geographical) boundaries clearly defined?	/1/	DR	The Ingenio Magdalena S.A. Cogeneration Project (also called as "MAGDALENA project") is located in the city of La Demeocracia, Department of Escuintla, Guatemala.		OK
A.1.2. Are the project's system (components and facilities used to mitigate GHGs) boundaries clearly defined?	/1/	DR	The project's system components mainly consist of the following equipments to be and/or already installed in four phases: Phase one was completed in 2005 with the installation of a 825 Psig boiler and a 16.5 MW condensing generator. At the time the PDD was published, the second phase of the project was under construction and it was expected to be completed for the 2006-2007 crop. The equipment being installed in this second stage consists of a 900 Psig boiler and 30 MW back pressure turbo generator. The third stage is to be completed by the end of 2007 and it will consist of the installation of an additional 900 Psig boiler and a 35 MW back pressure turbo generator. The fourth stage will consist of the installation of a 45 MW back		OK

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

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			pressure turbo generator. The total increase in the cogeneration capacity due to the whole project is 73 MW. Such capacity increase does not include old equipment, which will be kept as stand-by. The system includes, steam production comments were received, use of heat and electricity on site and transmission of electricity to the national grid.		
A.2. Technology to be employed <i>Validation of project technology focuses on the project engineering, choice of technology and competence/maintenance needs. The validator should ensure that environmentally safe and sound technology and know-how is used.</i>					
A.2.1. Does the project design engineering reflect current good practices?	/1/	DR	The project involves the installation of a boiler and cogeneration systems which reflect good practices through the use of the steam Rankine cycle technology for steam rising and power generation		OK
A.2.2. Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country?	/1/	DR	The project uses direct combustion technology for simultaneous heat and power generation. It involves the oxidation of biomass with excess air in a process that yields hot gases that are used to produce steam in boilers. The steam produced in these boilers is used to produce electricity.		OK
A.2.3. Is the project technology likely to be substituted by other or more efficient technologies within the project period?	/1/	DR	No. The technology is being successfully used since many years for steam turbines and so it is unlikely to be substituted by other better technologies at least during the		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			project lifetime.		
A.2.4. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period?	/1/	DR	The Rankine Cycle steam turbines will be imported from Brazil and USA. The project will also be using new equipment to transmit electricity to the grid and new control systems for this facility, which are not usually used in a sugar industry. Hence, initial training in operations and maintenance was required in order to carry out the project as planned. Indeed training was included as part of the equipment purchase deals.		OK
A.2.5. Does the project make provisions for meeting training and maintenance needs?	/1/	DR	Supported by the equipment suppliers, Ingenio Magdalena S.A. implemented a training program for the technical personnel regarding new equipment to be used for electricity generation.		OK
A.3. Contribution to Sustainable Development <i>The project's contribution to sustainable development is assessed.</i>					
A.3.1. Is the project in line with relevant legislation and plans in the host country?	/1/ /8/	DR	The use of thermal electricity in the generation system is not only in compliance with regulations but also widespread and of increasing importance. In accordance to the Guatemalan environmental legislation, Ingenio Magdalena S.A. obtained from Ministerio de Medio Ambiente y Recursos Naturales (Ministry of Environment and Natural Resources), two environmental license for operation of the different phases of the project. The first project phase was granted	CL-2	OK

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

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			with Environmental License as Resolution No. 494-2004/MAGC/EM on 24 May 2004, while the second project phase was granted with Environmental License as Resolution No. 251-2005/MAGC/LL on 01 February 2005.		
A.3.2. Is the project in line with host-country specific CDM requirements?	/1/ /7/	DR	This is confirmed by the DNA of Guatemala through the Letter of Approval issued on 21' December 2005.		OK
A.3.3. Is the project in line with sustainable development policies of the host country?	/1/ /7/	DR	See A.3.2.		OK
A.3.4. Will the project create other environmental or social benefits than GHG emission reductions?	/1/	DR	Since the project involves the installation of a new boiler, new turbo generators and new control systems, it will create new jobs that are related to a technology (equipment) not yet well known (manufactured) in Guatemala. The project is also expected to bring social, environmental and economic benefits.		OK
B. Project Baseline					
<i>The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.</i>					
B.1. Baseline Methodology					
<i>It is assessed whether the project applies an appropriate baseline methodology.</i>					
B.1.1. Is the baseline methodology previously approved by the CDM Executive Board?	/1/ /5/ /16/	DR	The project applies the approved baseline methodology ACM0006 - "Consolidated baseline methodology for grid-connected		OK

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

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			electricity generation from biomass residues" (version 04) and ACM0002 – "Consolidated baseline methodology for grid-connected electricity generation from renewable sources". (version 06).		
B.1.2. Is the baseline methodology the one deemed most applicable for this project and is the appropriateness justified?	/1/ /15/	DR	Yes. The project fulfils the conditions under which ACM0006 methodology is applicable. The project uses: a) only the bagasse from the same facility where the project activity is implemented, b) the project will not increase the bagasse production above the increase that would have occurred in the absence of the project and d) the bagasse to be used will not be stored for more than one year.	CAR-5	OK
B.2. Baseline Determination <i>The choice of baseline will be validated with focus on whether the baseline is a likely scenario, whether the project itself is not a likely baseline scenario, and whether the baseline is complete and transparent.</i>					
B.2.1. Is the application of the methodology and the discussion and determination of the chosen baseline transparent?	/1/ /15/	DR	<p>The project activity also fulfils all the applicability conditions of the methodology ACM0006.</p> <p>Baseline scenario no 14 has been selected.</p> <p>For power generation: The generation of power in existing and/or new grid connected power plants (P4) and continuation of power generation in the existing power plants, (P5).</p> <p>The continuation of heat generation in an, existing cogeneration plant, fired with the same type of biomass (bagasse) (H5).</p>	CAR-3 CAR-5 CL-8	OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			<p>For biomass use: The biomass is used for heat and/or electricity generation at the project site (B4).</p> <p>According to ACM0006 scenario 14 ,the net quantity of increased electricity generation as a result of the project activity shall be determined as follows:</p> $EG_y = EG_{projectplant,y} * \left(1 - \frac{\mathcal{E}_{el,preproject}}{\mathcal{E}_{el,projectplant,y}} \right)$		
B.2.2. Has the baseline been determined using conservative assumptions where possible?	/1/ /2/ /15/ /16/	DR	<p>The project uses generation data from the Administrador de Mercado Mayorista (Guatemala's Electricity Spot Market Administrator) and includes imported generation data.</p> <p>The baseline emission calculations are according to the baseline methodology ACM0006. For the determination of the grid emission factor, electricity generation data from the period 2003-2005.</p>	CAR-6	
B.2.3. Has the baseline been established on a project-specific basis?	/1/	DR	Yes		OK
B.2.4. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1/	DR	Yes. National and/or sectoral policies as well as macro-economic trends implemented before and during the project implementation were considered. The Guatemalan Government has passed new law for promoting renewable Sources of	CL-3	OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			Energy. Furthermore, the Power Law of Guatemala permits the Private Electricity Generation. There is also a provision for the long term contracts for Electricity. (Source: Guatemala Climate change & Energy sector - Ministry of Environment & Natural resources. http://www.etsap.org/worsh_4_2005/28.pdf). DNV also received a copy of the operational licenses to sell electricity to the grid and of the power purchase agreement.		
B.2.5. Is the baseline determination compatible with the available data?	/1/	DR	Yes		OK
B.2.6. Does the selected baseline represent the most likely scenario among other possible and/or discussed scenarios?	/1/	DR	Although the project activity increases both the efficiency and capacity of the prevailing bagasse based energy generation, project developers demonstrated that the verified increase in the thermal firing capacity in the project scenario would have also occurred in the baseline scenario due to the increase in sugar demand (thus increasing the thermal demand in the baseline configuration). Hence, it can be concluded that the project activity does not increase the firing capacity above the increase that would have occurred in the absence of the project. Due to that baseline scenario 14 is applicable. Also see B.2.7.	CAR-3	OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
B.2.7. Is it demonstrated/justified that the project activity itself is not a likely baseline scenario?	/1/ /3/	DR	<p>In accordance with ACM0006, the additionality of the project is demonstrated through the “<i>Tool for the demonstration and assessment of additionality</i>” /15/ which includes the following steps:</p> <p><i>Step 0. Preliminary screening based on the starting date of the project activity:</i> The project construction started in 19 February 2004 as evidenced through receipt of freight service of the new boiler to Ingenio Magdalena S.A.. Evidence that Ingenio Magdalena S.A. seriously considered the CDM in the decision to proceed with the project was presented in is provided through the minute of a meeting held by the company Board. Such meeting minutes, from 21 January 2003, refers to incentives and benefits of the CDM as a form of financing of the cogeneration project.</p> <p><i>Step 1. Identification of alternatives to the project activity consistent with current laws and regulations:</i> The possible scenarios are identified, i.e. i) baseline scenario: the generation of an equivalent amount of electricity by the generation mix of the Guatemalan electricity system; a system that continuously increases its dependency on thermal plants (using diesel and bunker) ii) project scenario: renewable thermal energy as a source of power. The provided alternatives are in compliance with the legal and regulatory requirements.</p>	CL-6	OK

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

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			<p><i>Step 2. Benchmark analysis:</i> The project IRR has been verified /4/ to be 8.9% which is below the adopted benchmark IRR of 13.5%. The adopted benchmark is the average active rates for loans in local currency of Guatemalan Banks at the time the investment decision was made. The project involves an investment above 20 millions USD in four phases. The electricity tariff is from the PPA. As part of the financial analysis, a sensitive analysis has been done by increasing the energy prices in 10% and also by decreasing the operational costs in 10%. In the best case the IRR reaches 13.0%. Hence, it can be concluded that the project is not financially attractive enough and thus is additional.</p> <p><i>Step 3: Barrier Analysis:</i> Institutional, technological and logistic barriers as well as core business barrier are presented in the PDD:</p> <p><i>Institutional Barrier:</i> Although the government of Guatemala recently implemented some incentives to promote the development of renewable energy projects, the results had been very modest for power generation in the country. DNV assessed that such policy instruments do not yet represent effective incentives for electricity generation from renewable energy sources instead of fossil fuels. As a</p>		

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

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			<p>result, DNV concludes that the current regulatory and market frameworks for energy generation in Guatemala constitute a barrier for the promotion of renewable energy in the country. Thus this should be considered as a barrier for the implementation of the project.</p> <p><i>Technological and logistic barriers:</i> Rankine Cycle steam turbines and the electricity transfer equipment are not produced in Guatemala and need to be imported. Installation and service of such equipment is normally carried out by engineers and technicians from abroad. In addition since, the operating staff of the project proponent is not skilled enough, extensive training for local staff on the operation of the new control equipment (also imported) is needed. DNV concludes that such aspects represent barriers that could be alleviated by the incentives of the CDM.</p> <p><i>Core Business Barrier.</i> The production of electricity to supply electricity to the grid is not the principal business of Ingenio Magdalena S.A. and supplementary knowledge needed to be acquired for this additional service provision.</p> <p>Step 4. Common Practice Analysis: It has been argued that while cogeneration projects are wide spread among the sugar cane producers in Guatemala, the prevailing practice power is only for self consumption</p>		

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			<p>(to produce enough energy to maintain the companies independent from the grid) and to eliminate (burn) the bagasse, sugar-cane's byproduct. It should also be noted that, at the time that Ingenio Magdalena S.A. Cogeneration Project was initially submitted for validation, the only other cogeneration project in Guatemala supplying electricity to the national grid (San Diego Cogeneration Project) was also being implemented as a CDM project.</p> <p><i>Step 5. Impact of CDM registration:</i> The project participants were able to demonstrate that the sale of CERs will provide the complementary incentives for the project to alleviate the above presented barriers.</p> <p>Given the above, it is sufficiently demonstrated that the project is not a likely baseline scenario and that emission reductions are thus additional.</p>		
B.2.8. Have the major risks to the baseline been identified?	/1/	DR	The baseline does not have any major risks.		OK
B.2.9. Is all literature and sources clearly referenced?	/1/	DR	See B.2.7.		OK
C. Duration of the Project/ Crediting Period <i>It is assessed whether the temporary boundaries of the project are clearly defined.</i>					
C.1.1. Are the project's starting date and operational lifetime clearly defined and reasonable?	/1/	DR	Yes. The project start date is 19 February 2004 with an expected lifetime of 25 years..	CL7	OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
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 7-year crediting period was defined, starting on 1 March 2005.		OK
D. Monitoring Plan <i>The monitoring plan review aims to establish whether all relevant project aspects deemed necessary to monitor and report reliable emission reductions are properly addressed ((Blue text contains requirements to be assessed for optional review of monitoring methodology prior to submission and approval by CDM EB).</i>					
D.1. Monitoring Methodology <i>It is assessed whether the project applies an appropriate baseline methodology.</i>					
D.1.1. Is the monitoring methodology previously approved by the CDM Executive Board?	/1/ /15/	DR	The project applies the approved consolidated monitoring methodology for "grid-connected electricity generation from biomass residues" ACM0006 (). See B.1.1.		OK
D.1.2. Is the monitoring methodology applicable for this project and is the appropriateness justified?	/1/	DR	Yes. The methodology is applicable for the following reasons: The increase in the sugar production is not attributed to the project activity but to business demand. The biomass used in the project activity will not be stored for more than one year. Clarification is required on whether the same type of biomass was used in the system prior to the project activity.	GAR-5	OK
D.1.3. Does the monitoring methodology reflect good monitoring and reporting practices?	/1/	DR	Yes, The monitoring intervals have been defined as well as the calibration requirements and QA/QC practices.		OK

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

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
D.1.4. Is the discussion and selection of the monitoring methodology transparent?	/1/	DR	Yes.		OK
D.2. Monitoring of Project Emissions <i>It is established whether the monitoring plan provides for reliable and complete project emission data over time.</i>					
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 period?	/1/	DR	Yes. The quantity of bunker oil used and its emission factor will be monitored.		OK
D.3. Monitoring of Leakage <i>It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.</i>					
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 ACM0006, scenario 14, the leakage effects do not need to be addressed.		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
D.4. Monitoring of Emissions Reduction <i>It is established whether the monitoring plan provides for reliable and complete project emission data over time.</i>					
D.4.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining the emissions reduction during the crediting period?	/1/	DR	<p>Data to be monitored includes the net electricity generated, the net increase electricity due to the project activity, the average net efficiency of electricity generation, amount of fossil fuels used, the bagasse burned and the bagasse NCV.</p> <p>The electricity supplied to the grid will not give the actual additional electricity produced by the project. As, some amount of electricity would potentially have been imported from the grid in the absence of the project. The calculation sheet for the grid emission factor is to be submitted for validation.</p>	CAR-4	OK
D.4.2. Is the choice of baseline indicators, in particular for baseline emissions, reasonable?	/1/	DR	Yes, the choice of the baseline indicators is reasonable.		OK
D.4.3. Will it be possible to monitor / measure the specified baseline indicators?	/1/	DR	Yes.		OK
D.4.4. Will the indicators give opportunity for real measurements of baseline emissions?	/1/		Yes.		OK
D.5. Monitoring of Sustainable Development Indicators/ Environmental Impacts <i>It is checked that choices of indicators are reasonable and complete to monitor sustainable performance over time.</i>					
D.5.1. Does the monitoring plan provide the collection	/1/	DR	The baseline and monitoring methodology		OK

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

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
and archiving of relevant data concerning environmental, social and economic impacts?			of ACM0006 does not require the monitoring of sustainable development indicators.		
D.6. Project Management Planning <i>It is checked that project implementation is properly prepared for and that critical arrangements are addressed.</i>					
D.6.1. Is the authority and responsibility of project management clearly described?	/1/	DR	Ingenio Magdalena S.A. is responsible for the project management.		OK
D.6.2. Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described?	/1/	DR	Ingenio Magdalena S.A. is responsible for the registration, monitoring, measurement and reporting.	CL-4	OK
D.6.3. Are procedures identified for training of monitoring personnel?	/1/	DR	The supplier(s) of the boiler(s), the turbo generator(s) and the DCS (Distributed Control System) will carry on the full training of the plant's personnel.		OK
D.6.4. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/	DR	Not applicable.		OK
D.6.5. Are procedures identified for calibration of monitoring equipment?	/1/	DR	The calibration of the monitoring instruments will be done according to the regulations of CNEE (National Electrical Energy Company) The plant has a DCS (Distributed Control System) that monitors, reports and records all relevant process variables and manages corrective actions. The NCV will be monitored every six months by a third party independent laboratory		OK
D.6.6. Are procedures identified for maintenance of	/1/	DR	See D.6.3		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
monitoring equipment and installations?					
D.6.7. Are procedures identified for monitoring, measurements and reporting?	/1/	DR	Yes, Ingenio Magdalena S.A. is entirely responsible for the project monitoring and reporting procedure which also includes measuring and monitoring of fuel oil consumption.	CL-5	OK
D.6.8. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/1/	DR	Ingenio Magdalena S.A. is entirely responsible for the project monitoring and reporting.		OK
D.6.9. Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	/1/	DR	The project developer will proceed with the necessary measures for the power control and monitoring.		OK
D.6.10. Are procedures identified for review of reported results/data?	/1/	DR	See D.6.8.		OK
D.6.11. Are procedures identified for internal audits of GHG project compliance with operational requirements where applicable?	/1/	DR	Ingenio Magdalena S.A. is entirely responsible for the project monitoring and reporting.		OK
D.6.12. Are procedures identified for project performance reviews before data is submitted for verification, internally or externally?	/1/	DR	See D.6.8.		OK
D.6.13. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	/1/	DR	See D.6.8.		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
E. Calculation of GHG Emissions by Source <i>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.</i>					
E.1. Project GHG Emissions <i>The validation of ex-ante estimated project GHG emissions focuses on transparency and completeness of calculations.</i>					
E.1.1. Are all aspects related to direct and indirect GHG emissions captured in the project design?	/1/	DR	The project uses fossil fuels. This is considered in the calculation of project emissions.		OK
E.2. Leakage <i>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.</i>					
E.2.1. Are potential leakage effects beyond the chosen project boundaries properly identified?	/1/	DR	As per ACM0006, leakage needs not to be identified.		OK
E.3. Baseline Emissions <i>The validation of ex-ante estimated baseline GHG emissions focuses on transparency and completeness of calculations.</i>					
E.3.1. Have the most relevant and likely operational characteristics and baseline indicators been chosen as reference for baseline emissions?	/1/ /15/ /16/	DR	Baseline emissions are from displacement of grid electricity. For the displacement of grid electricity, the electricity baseline emission coefficient of		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			<p>the grid is estimated by determining an OM and BM emission coefficient in accordance with ACM0002 as required by ACM0006. In spite of the emission factor has been determined following the guidance in the section "Baselines" in the methodology ACM0002 as required by ACM0006, the PDD does not report this. The calculations of the OM and BM emission coefficient used to estimate emission reductions have not been given. The worksheets for the same have to be provided.</p> <p>The dispatch data analysis method was not applied due to lack of data. Additionally, in Honduras 50% of the total grid generation from past 5 years comes from low cost/must run resources. Hence, simple OM method was chosen for the calculation of the EF of OM and BM.</p> <p>The data used for calculation has to be provided along with the data sources.</p>		
E.3.2. Are the baseline boundaries clearly defined and do they sufficiently cover sources and sinks for baseline emissions?	/1/ /16/	DR	The system boundary includes the electricity supplied to grid, the electricity system of grid (In reference to OM and BM).		OK
E.3.3. Are the GHG calculations documented in a complete and transparent manner?	/1/	DR	See E.3.1.	CAR-4 CAR-2 CAR 4	
E.3.4. Have conservative assumptions been used when calculating baseline emissions?	/1/	DR	Yes.		OK
E.3.5. Are uncertainties in the GHG emission estimates properly addressed in the documentation?	/1/	DR	Yes.		OK

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

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
E.3.6. Have the project baseline(s) and the project emissions been determined using the same appropriate methodology and conservative assumptions?	/1/	DR	Yes.		OK
E.4.Emission Reductions <i>Validation of ex-ante estimated emission reductions.</i>					
E.4.1. Will the project result in fewer GHG emissions than the baseline scenario?	/1/	DR	The project is expected to reduce CO ₂ emissions to the extent of 1 010 448 tCO ₂ e (144 350 tCO ₂ e / year average) over the first renewable 7-year crediting period.	CAR-1 CAR-2	OK
F. Environmental Impacts <i>Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.</i>					
F.1.1. Has an analysis of the environmental impacts of the project activity been sufficiently described?	/1/	DR	Yes, an EIA was conducted and it included issues like usage of Resources, legislation to be observed, impacts to climate and air quality, geological and soil impacts, hydrological impacts (surface and groundwater), impacts to the flora and animal life, socio-economic (necessary infra-structure, legal and institutional, etc.), local stakeholders comments, mitigation measures and monitoring plan. On the successful completion of the EIA, Ingenio Magdalena S.A. obtained from Ministerio de Medio Ambiente y Recursos Naturales (Ministry of Environment and Natural Resources), two environmental licenses for operation of the different phases of the	CL-2	OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			project. The first project phase was granted with Environmental License as Resolution No. 494-2004/MAGC/EM on 24 May 2004, while the second project phase was granted with Environmental License as Resolution No. 251-2005/MAGC/LL on 01 February 2005.		
F.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	/1/	DR	Yes. See F.1.1.		OK
F.1.3. Will the project create any adverse environmental effects?	/1/	DR	Project design did not identified/addressed any environmental impact; however, no significant adverse environmental effects are expected to be created, given the nature of the project design. This is mentioned in the Environmental Licences.	CL 2	OK
F.1.4. Are transboundary environmental impacts considered in the analysis?	/1/	DR	Transboundary environmental impacts are not foreseen.		OK
F.1.5. Have identified environmental impacts been addressed in the project design?	/1/	DR	The project is unlikely to create any adverse environmental impacts. See F.1.1		OK
F.1.6. Does the project comply with environmental legislation in the host country?	/1/	DR	Yes. See F.1.1	CL 2	OK
G. Stakeholder Comments <i>The validator should ensure that a stakeholder comments have been invited and that due account has been taken of any comments received.</i>					
G.1.1. Have relevant stakeholders been consulted?	/1/ /10/ /11/ /12/	DR	As part of the process for obtaining the Environmental Licenses for the project phases, Ingenio Magdalena S.A. initially published in a national newspaper a call inviting stakeholders to make comments on	CAR-7 CL 1	OK

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

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			<p>the completed EIA (October 2003) /10/. Later, in another call for comments published a in a national newspaper, Ingenio Magdalena S.A. invited stakeholders to make comments regarding the second phase of the project (November 2004) /10/. In addition to these public calls conducted as a part of the EIA, Ingenio Magdalena S.A. hired a private consultant to perform a survey among the surrounding communities on the impacts of the operation of Magdalena Cogeneration project. During the survey, such stakeholder were also invited to provide comments. Comments received during the survey were incorporated into the EIA report.</p> <p>More recently, with a view to carrying out a more specific process focused on the CDM project Ingenio Magdalena S.A. sent letters informing local stakeholders that the cogeneration project project at Ingenio Magdalena is being undertaken as a CDM project and also inviting such stakeholder to provide related comments /11/. Letters were sent to the municipalities of La Democracia and Escuintla, and different departments of the Ministry of Environment and Natural Resources. No comments were received.</p>		
G.1.2. Have appropriate media been used to invite comments by local stakeholders?	/1/	DR	Yes. See G.1.1.	CAR-7	OK
G.1.3. If a stakeholder consultation process is required	/1/	DR	Yes. See G.1.1		OK

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

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?					
G.1.4. Is a summary of the stakeholder comments received provided?	/1/	DR	Yes. See G.1.1.		OK
G.1.5. Has due account been taken of any stakeholder comments received?	/1/	DR	See G.1.1.		OK

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

Table 3 Resolution of Corrective Action and Clarification Requests

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
<p>CAR 1</p> <p>The calculation of the emissions from the fuel oil burning in the project is not evidenced in the PDD. Furthermore, in E.5 it is stated that <i>"there are no project emissions"</i> but in E.6 table, estimated project emissions are presented.</p>	<p>E.3.3</p> <p>E.4.1</p>	<p>The calculation of the emissions from the fuel oil burning in the project is shown in section E.1 Table in section E.6 presents the calculation considering project emissions.</p>	<p>The reviewed PDD version 3 addressed the information adequately.</p> <p>This CAR is therefore closed</p>
<p>CAR 2</p> <p>DNV asks for an explanation about the differences between the values of B.2 and E.4. In B.2 table the total generation for 2011 can be calculated as 452 952 MWh. In E.4 table it appears as 504 505 MWh. This has a consequence in calculation of the emission reductions. In addition, the exported energy values are smaller than the EGy values appearing in E.4. DNV asks for an explanation of why the the last column of the B.2 table is not considered as EGy</p>	<p>E.3.3</p> <p>E.4.1</p>	<p>The values of the table in section B.2 were corrected and are now presented in Annex 3. EGy is calculated as per Equation 12, in section E.4. The calculation is shown in spreadsheet "Magdalena_CERs_calculation_scenario14_2006.12.08.xls"</p>	<p>Complementary documentation clarify the calculation of the project.</p> <p>This CAR is therefore closed</p>
<p>CAR 3</p> <p>The project increases both the efficiency and capacity of the prevailing bagasse based energy generation. Hence, this is rather scenario 14 than 12, since the existing biomass power plant is not continued to be operated, but was or will be deactivated</p>	<p>B.2.6</p>	<p>Although the project activity increases both the efficiency and capacity of the prevailing bagasse based energy generation, project developers demonstrated that the verified increase in the thermal firing capacity in the project scenario would have also occurred in the baseline scenario due to the increase in</p>	<p>The reviewed PDD version 3 demonstrates adequately the applicability of scenario 14.</p> <p>This CAR is therefore closed</p>

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
		sugar demand (thus increasing the thermal demand in the baseline configuration). Hence, it can be concluded that the project activity does not increase the firing capacity above the increase that would have occurred in the absence of the project. Due to that baseline scenario 14 is applicable as stated in section B.1.1	
<p>CAR 4</p> <p>The monitoring methodology of ACM0006 is not correctly applied. Instead of monitoring the electricity exported (energy meter) to the grid, ACM0006 requires the monitoring of:</p> <ul style="list-style-type: none"> - the net quantity of electricity generated by the project plant (total generation minus auxiliary consumption), - the quantity of bagasse combusted in the project plant - the calculation of the average net energy efficiency for electricity production of the plant 	E.3.3 D.4.1	<p>The net quantity of electricity generated by the project plant (total generation minus auxiliary consumption), the quantity of bagasse combusted in the project plant and the calculation of the average net energy efficiency for electricity production of the plant are being monitored, as shown in section D.2.1.3.</p>	<p>Reviewed PDD version 3 addressed the information adequately.</p> <p>This CAR is therefore closed.</p>
<p>CAR 5</p> <p>To confirm if scenario 14 is applicable for this project activity, a clear description of the project site along with the biomass power generation unit prior to the project activity has to be provided. The following clarifications should be provided:</p> <ul style="list-style-type: none"> •What was the scenario with the original production capacity of the sugar plant? •How much electricity was imported from the 	B.1.2 D.1.2	<p>In the PDD in section A.2 and A.4.3 it has been given that old boilers were replaced by new highly efficient 825 psig and 900 psig (2x) boilers and old turbo generators were replaced by new 16.5 MW, 30 MW, 35 MW and 45 MW turbo generators.</p> <ul style="list-style-type: none"> •What was the scenario with the original production capacity of the sugar plant? See PDD, Annex 3. •How much electricity was imported from the 	<p>Complementary information justifies the scenario selection and was considered adequate.</p> <p>This CAR is therefore closed.</p>

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
<p>grid in that case and how much was self generated?</p> <ul style="list-style-type: none"> •Whether the same type of biomass was used in the previous system. •Whether the equipment to be installed in the second, third and fourth phases was part of the design plan in 2003. 		<p>grid in that case and how much was self generated? No energy was imported. See PDD, Annex 3 for the amount of electricity generated in the baseline.</p> <ul style="list-style-type: none"> •Whether the same type of biomass was used in the previous system. Yes, the same type of biomass was used in the previous system. •Whether the equipment to be installed in the second, third and fourth phases was a part of the design plan in 2003. Yes, it was. 	
<p>CAR 6</p> <p>For the determination of the grid emission factor, electricity generation data from the period 2002-2004 is adopted in PDD version 2. This is not the most recent available electricity generation data. Data for the 2003-2005 period was already available by the time the PDD version 2 was published. Grid emission factor calculation should be updated.</p>	B.2.2	<p>The PDD version 4 considers the period 2003-2005 for calculation of Baseline Emission Factor shown in the attached spreadsheet "Guatemala baseline 2005.xls"</p>	<p>PDD version 4 addressed the information adequately. The spreadsheet with calculation was presented. This CAR is therefore closed.</p>
<p>CAR 7</p> <p>Although the environment licence process for the mill expansion included public consultation, the project lacks consultation with the relevant stakeholders for the CDM project.</p>	<p>G.1.1 G.1.2 G.1.3 G.1.4 G.1.5</p>	<p>The consultation to stakeholder relevant to the CDM project was evidenced by copies of the letters sent to municipalities and Ministry of Environment and Natural Resources in March 2007.</p>	<p>Public comments were invited by a letter asking for general comments and not only linked to environmental facts thus it can be acknowledge that stakeholders were invited for comments. This action complements the consultation process to the stakeholder involves in obtaining the environmental licence, which represent a broad spectrum of</p>

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
			parties that could be affected by the project. This CAR is therefore closed
CL 1 DNV requests evidences that: (a) the stakeholders were invited to comment on the impact of the project; (b) the survey resulted in a positive reaction from the community	G.1.1	For stakeholders' comments invitation, see "Magdalena Stakeholders call 16 5MW.doc" and "Magdalena Stakeholders call 30 MW.doc". For local stakeholders comments, see annexed document "Magdalena_local stakeholders comments.jpg". Also consider letters more recently sent to relevant local stakeholders informing about the CDM project and calling for comments "Magdalena_carta invita comentarios_alcalde Escuintla.doc", "Magdalena_carta invita comentarios_Delegado MARN.doc", "Magdalena_carta invita comentarios_alcalde Democracia.doc"	Complementary documentation evidences the adequate stakeholders consultation and the positive opinion about the project. This CL is therefore closed
CL 2 DNV requests a copy of the environmental license(s), including the environmental report	A.3.1 F.1.1 F.1.3 F.1.5	See annexed documents "Environmental license 16.5 MW.doc" and "Environmental license 30 MW.doc". There is a license for the installation of the 16.5 MW turbo and other for the 30 MW turbo. At first, the first of these licenses was intended for 2 turbos of 16.5 MW, and the power mentioned in the license is 33 MW. Though just one turbo was installed, there was no need to change the document, and the project received the LoA from the government.	Complementary documentation evidences the compliance Environmental issues. This CL is therefore closed
CL 3 DNV requests a copy of the operational licenses to sell electricity to the grid and of the power purchase agreement in order to	B.2.4	See the PPA document annexed.	The additional document (PPA) could evidence the agreement and confirm the capacity of generation.

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
confirm the capacity / electricity generation to be internally used, capacity / electricity generation to be exported to the grid and days / hours per year of generation			This CL is therefore closed
CL 4 The authority and responsibility for registration, monitoring, measurement and reporting are not clearly described	D.6.2	Ingenio Magdalena S.A. is responsible for the project registration, monitoring, measurement and reporting, as stated in section D.4.	Reviewed PDD version 3 addressed the information adequately. This CL is therefore closed.
CL 5 Procedures for monitoring, measurements and reporting of fuel oil consumption were not identified	D.6.7	Procedures for monitoring, measurements and reporting of fuel oil consumption are identified in section D.2.1.1	Reviewed PDD version 3 addressed the information adequately. This CL is therefore closed.
CL 6 DNV requests evidences that the meeting held by Ingenio Magdalena's Board on January 21, 2003 mentions the incentives of the CDM as a form of financing of the project	B.2.7	See annexed document "Magdalena CDM evidence.tif."	Complementary documentation evidences the compliance with step 0 of the additionality tool.. This CL is therefore closed
CL 7 DNV requests evidences of the project's starting date and clarifications regarding the different project starting dates mentioned at items B.3 and C.1.1	C.1.1	The project's starting date was February 19, 2004, when the boiler was transported to the mill. March 1, 2005 was the starting date of energy export.	Complementary documentation evidences the start up of project. This CL is therefore closed
CL 8 Clarification is required on whether electricity from the grid was being used for the sugar production facility.	B.2.1	No, electricity from the grid was not being used before the Project (see Annex 3).	Complementary information was considered adequate. This CL is therefore closed.

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APPENDIX B

CERTIFICATES OF COMPETENCE



CERTIFICATE OF COMPETENCE

Michael Lehmann

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJ1-i1)

GHG Auditor:	Yes		
CDM Validator:	Yes	JI Validator:	--
CDM Verifier:	Yes	JI Verifier:	--
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 1, 2, 3 & 9		
Technical Reviewer for (group of) methodologies:			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	Yes	AM0027	Yes
ACM002, AMS-I.A-D, AM0019, AM0026, AM0029, AM0045	Yes	AM0028, AM0034	Yes
ACM003, ACM0005, AM0033, AM0040	Yes	AM0030	Yes
ACM0004	Yes	AM0031	Yes
ACM0006, AM0007, AM0015, AM0036, AM0042	Yes	AM0032	Yes
ACM0007	Yes	AM0035	Yes
ACM0008	Yes	AM0038	Yes
ACM0009, AM0008, AMS-III.B	Yes	AM0041	Yes
AM0006, AM0016, AMS-III.D, ACM0010	Yes	AM0034	Yes
AM0009, AM0037	Yes	AM0043	
AM0013, AM0022, AM0025, AM00379, AMS-III.H, AMS-III.I	Yes	AM0046	
AM0014	Yes	AM0047	
AM0017	Yes	AMS-II.A-F, AM0044	Yes
AM0018	Yes	AMS-III.A	Yes
AM0020	Yes	AMS-III.E, AMS-III.F	Yes
AM0021	Yes		
AM0023	Yes		
AM0024	Yes		

Høvik, 5 February 2007

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director



CERTIFICATE OF COMPETENCE

Einar Ternes

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJ1-i1)

GHG Auditor:	Yes		
CDM Validator:	Yes	JI Validator:	--
CDM Verifier:	Yes	JI Verifier:	--
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 1, 2, 3 6 & 10		
Technical Reviewer for (group of) methodologies:			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	Yes	AM0027	Yes
ACM002, AMS-I.A-D, AM0019, AM0026, AM0029, AM0045	Yes	AM0028, AM0034	Yes
ACM003, ACM0005, AM0033, AM0040	Yes	AM0030	Yes
ACM0004	Yes	AM0031	Yes
ACM0006, AM0007, AM0015, AM0036, AM0042	Yes	AM0032	Yes
ACM0007	Yes	AM0035	Yes
ACM0008	Yes	AM0038	Yes
ACM0009, AM0008, AMS-III.B	Yes	AM0041	Yes
AM0006, AM0016, AMS-III.D, ACM0010	Yes	AM0034	Yes
AM0009, AM0037	Yes	AM0043	
AM0013, AM0022, AM0025, AM00379, AMS-III.H, AMS-III.I	Yes	AM0046	
AM0014	Yes	AM0047	
AM0017	Yes	AMS-II.A-F, AM0044	Yes
AM0018	Yes	AMS-III.A	Yes
AM0020	Yes	AMS-III.E, AMS-III.F	Yes
AM0021	Yes		
AM0023	Yes		
AM0024	Yes		

Høvik, 5 February 2007

Einar Ternes
Director, International Climate Change Services

Michael Lehmann
Technical Director



CERTIFICATE OF COMPETENCE

Miguel Rescalvo

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJ1-i1

GHG Auditor:	Yes		
CDM Validator:	Yes	JI Validator:	--
CDM Verifier:	--	JI Verifier:	--
Industry Sector Expert for Sectoral Scope(s):	--		

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director

Filipe Tavares

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJ1-i1

GHG Auditor:	Yes		
CDM Validator:	Yes	JI Validator:	--
CDM Verifier:	Yes	JI Verifier:	--
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 9 & 13		

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director



CERTIFICATE OF COMPETENCE

Marco Ratton

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-
CDMJi-i1

<i>GHG Auditor:</i>	Yes		
<i>CDM Validator:</i>	--	<i>JI Validator:</i>	--
<i>CDM Verifier:</i>	--	<i>JI Verifier:</i>	--
<i>Industry Sector Expert for Sectoral Scope(s):</i>	--		

Høvik, 5 February 2007

Einar Telnes
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