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

CONTENTS

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

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

Quimvale and Gas Natural Fuel Switch Project

Version 3, 29 September, 2006

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

Quimvale is a chemical installation that produces $CaCO_3$ (precipitate). In order to produce $CaCO_3$, a sequence of chemical reactions and a drying out process for the final product are required. The project activity consists of the investment in adapting the previous boiler (used for the drying out process), which utilized fuel oil to one which utilizes natural gas. Added revenue and other non-measurable benefits derived from the sale of carbon credits and participation in the Kyoto Protocol are enough to make the conversion.

The project activity helps Brazil accomplish its goals of promoting sustainable development. Specifically, the project is in line with host-country specific CDM requirements because it:

- Contributes to local environmental sustainability since it will decrease the use of fuel oil, a carbon intense fuel that causes noteworthy local air pollution;
- Acts as a clean technology demonstration project which has replication relevance across Brazil;
- Creates social benefits related to improvement of labour conditions;
- Increases employment opportunities in the project location – the conversion requires a labour force for it's implementation;
- Contributes to technology and capacity development – all technology, labour, and technical maintenance will be provided within Brazil;
- Demonstrates the use of a new mechanism for funding environmentally friendly technologies, in this case, a mechanism (CDM) which reduces emissions of greenhouse gases.

A.3. Project participants:

Table 1 - Project Participants

Name of Party involved	Private and/or public entity (ies) project participants (as applicable)	Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No)
Brazil (Host Country)	Quimvale	No
Spain	Gas Natural	No
(*) In accordance with the CDM modalities and procedures, at the time of making the CDM-PDD public at the stage of validation, a Party involved may or may not have provided its approval. At the time of requesting registration, the approval by the Party(ies) involved is required.		

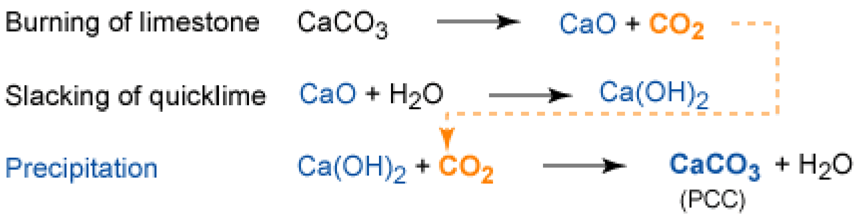
Further contact information of project participants is provided in Annex 1.

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

The project activity replaces the use of fuel oil with natural gas in the boiler used for drying in the manufacturing process described below:

Manufacturing Process:

At Quimvale, precipitated calcium carbonate is produced using Limestone. Limestone is converted into calcium oxide and carbon dioxide by means of calcination at temperatures in excess of 900°C. After the calcined lime has been slaked with water, the resulting "milk of lime" is purified and carbonated with the carbon dioxide obtained from the calcination process (See reactions below). The chemical reaction for $CaCO_3$ (precipitated) production occurs in a cycle where a calcinations furnace produces calcium oxide (CaO virgem) from the $CaCo_3$. The CaO passes into the hydrators to turn into calcium hydroxide ($Ca(OH)_2$), which goes to the carbonators to react with the CO_2. The CO_2 that is used for the reaction comes from the exhaust gas of the calcinations furnace. As a result of that cycle there is the production of $CaCO_3$. The following stages are the concentration purification stage and the drying out stage in dummy dryers: , where the fuel switch takes place



The dummy dryer is a cylinder in which steam passes in the middle and the liquid $CaCO_3$ (approximately 20% solid) stays on the outside; the drying out happens due to the temperature exchange, vaporizing the water content in the $CaCO_3$. Historically, the steam in the boiler was generated with using fuel oil as the energy source, after the fuel switch natural gas is used.

Please see Table 2 for boiler specifications.

Table 2 - Boiler Technical Details

Name	#	Manufacturer	Model	Nominal capacity	Energy Source	Fuel Switch date	Remaining Lifetime
Boiler ATA AWN 10	1	ATA	AWN 10	10 tons of steam/hr	Fuel oil	February 2003	More than 20 years

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

A.4.1.1. Host Party(ies):

Brazil

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

State of Rio de Janeiro

A.4.1.3. City/Town/Community etc:

Barra do Pirai

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

Av. Paulo Fernandes, 1603 – C.P 82827, ZIPCode: 27.143050 Tel (+55 24) 2447 2800

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

According to Appendix B of Simplified modalities and procedures for small scale CDM projects version 6, of 30 September 2005, the project activity is type AMS-III.B.

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

The start of the project activity was March 1, 2003, with the equipment localized at the Quimvale site. The equipment relevant to this fuel switch project is utilized during the $CaCO_3$ production processes. The project activity will reduce CO_2 emissions by replacing the fuel oil, a carbon intensive source, with natural gas (less carbon intense fuel), used in the production of $CaCO_3$. The baseline is defined as the consumption of fuel oil for the production of $CaCO_3$. Additionally, the CH_4, and N_2O resulting from fuel combustion are not accounted for in the calculation of baseline and project emissions.

According to the methodology, the Baseline Scenario is defined as the current (historical) use of fossil fuels (oil) in the existing facility up to the end of the crediting period without any retrofit, which extends its capacity or lifetime or improves its fuel efficiency. For this project activity the baseline is defined as the continued consumption of fuel oil for the production of $CaCO_3$, excluding any additional equipment or expansion.

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

Table 3 - Estimated Amount of Emission Reductions from the Project Activity

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

Please indicate the chosen crediting period and the total emissions reductions as well as annual estimates for the chosen crediting period . Information on the emissions reductions shall be indicated using the following tabular format	
Years	Annual estimation of emissions reductions in tonnes of CO2
2003	9,710
2004	11,652
2005	11,652
2006	11,652
2007	11,652
2008	11,652
2009	11,652
2010	11,652
2011	11,652
2012	11,652
2013	1,942
total estimated reductions (tones of CO2)	116,520
Total number of crediting years	10 years
Annual average over the crediting period of estimated reductions (tonnes of CO2 e)	11,652

*****Note: Total relevant $CaCO_3$ production is based on approximately 10 months during the year the fuel switch occurred (2003), and the 2013 emissions are based on only 2 months.

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

The project will not receive any public funding from Parties included in Annex I of the UNFCCC.

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

This small scale fuel switch project is not part of a larger emission-reduction project given that this is a unique CDM project proposed by Gas Natural and Quimvale in the south-east region of Brazil.

According to Appendix C to the simplified modalities and procedures for the small-scale CDM project activities, the project is not part of a larger CDM project activity. There is no registered small-scale CDM project activity or an application to register another small-scale CDM project activity:

- With the same project participants; and
- In the same project category and technology/measure; and
- Registered within the previous 2 years; and
- Whose project boundary is within 1 km of the project boundary of the proposed small-scale activity at the closest point.

Therefore, this project is not a debundled component of a larger project activity.

SECTION B. Application of a baseline methodology:

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

- Methodology AMS- III.B. – Switching Fossil Fuels.

From *Appendix B* of Simplified Modalities and Procedures for small scale CDM projects version 9, 28 July 2006.

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

The project activity is applicable to small-scale project type III.B. -Switching Fossil Fuels:

- Methodology AMS- III.B. – Switching Fossil Fuels.

The project attends to all of the applicability requirements required by AMS-III.B. This category comprises "Other Project Activity" sources such as fuel switch from fuel oil to natural gas. The Quimvale project will use natural gas in the boiler and has estimated annual emissions of **8,160** CO_2e, thus smaller than 15,000 tonnes of CO_2e annually, making it applicable as a small-scale project. Furthermore, the emission reductions achieved through this project activity (**11,652** tons of CO_2e, average per year) are below 15,000 tonnes of CO_2e annually.

Table 4 – Methodology AMS-III-B. Requirements

Project Type	Type III – Other Project Activities.
Project Category	III. B. Switching fossil fuels.
Technology/Measure	This category comprises fossil fuel switching in existing industrial, residential, commercial, and institutional or electricity generation applications. Fuel switching may change efficiency as well. If the project activity primarily aims at reducing emissions through fuel switching, it falls into this category. If fuel switching is part of a project activity focused primarily on energy efficiency, the project activity falls in category II.D or II.E. Measures shall both reduce anthropogenic emissions by sources and directly emit less than 15 kilotonnes of carbon dioxide equivalent annually.
Boundary	The project boundary is the physical, geographical site where the fuel combustion affected by the fuel-switching measure occurs.
Baseline	The emission baseline is the current emissions of the facility expressed as emissions per unit of output (e.g., kg CO_2equ/kWh). Emission

	coefficients for the fuel used by the generating unit before and after the fuel switch are also needed. IPCC default values for emission coefficients may be used.
Leakage	No leakage calculation is required.
Monitoring	Monitoring shall involve: (a) Monitoring of the fuel use and output for an appropriate period (e.g., a few years, but records of fuel use may be used) prior to the fuel switch being implemented; (b) Monitoring fuel use and output after the fuel switch has been implemented - e.g. gas use and heat output by a district heating plant, gas use and electricity generated by a generating unit.

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

The project activity involves a fuel switch to natural gas at a boiler that historically utilized oil. Under the business as usual scenario there would be continued use of oil. Without the fuel switch the boiler would continue to utilize fuel oil, and thus have GHG emissions based on the utilization of fuel oil.

Due to the fact that in previous years natural gas prices were higher than fuel oil prices, and that the switch to natural gas requires an investment, the fuel switch was not the most attractive course of action, and thus not the baseline. As will be demonstrated in the following steps, CDM revenue has been considered from the early stages of development of the project, and it is an integral part of the financial package of the project. The Developer took the decision to move ahead with the project after considering CDM benefits under the Kyoto Protocol. In the early gas delivery negotiations with Quimvale, CEG (the natural gas supplier) offered Quimvale assistance in developing the CDM project (Marcelo Lima CEG, *pers. com*).

Additionality:

According to *Attachment A* to *Appendix B* of the simplified modalities and procedures for CDM small scale project activities, evidence as to why the proposed project is additional can be shown by conducting an analysis of any of the following: (a) investment barriers, (b) technological barriers, (c) prevailing practice and (d) other barriers.

Evidence to why the Quimvale and Gas Natural Fuel Switch Project is additional is offered under the following categories of barrier: **(1) Investment/Financial barrier, and (4) Other barriers.**

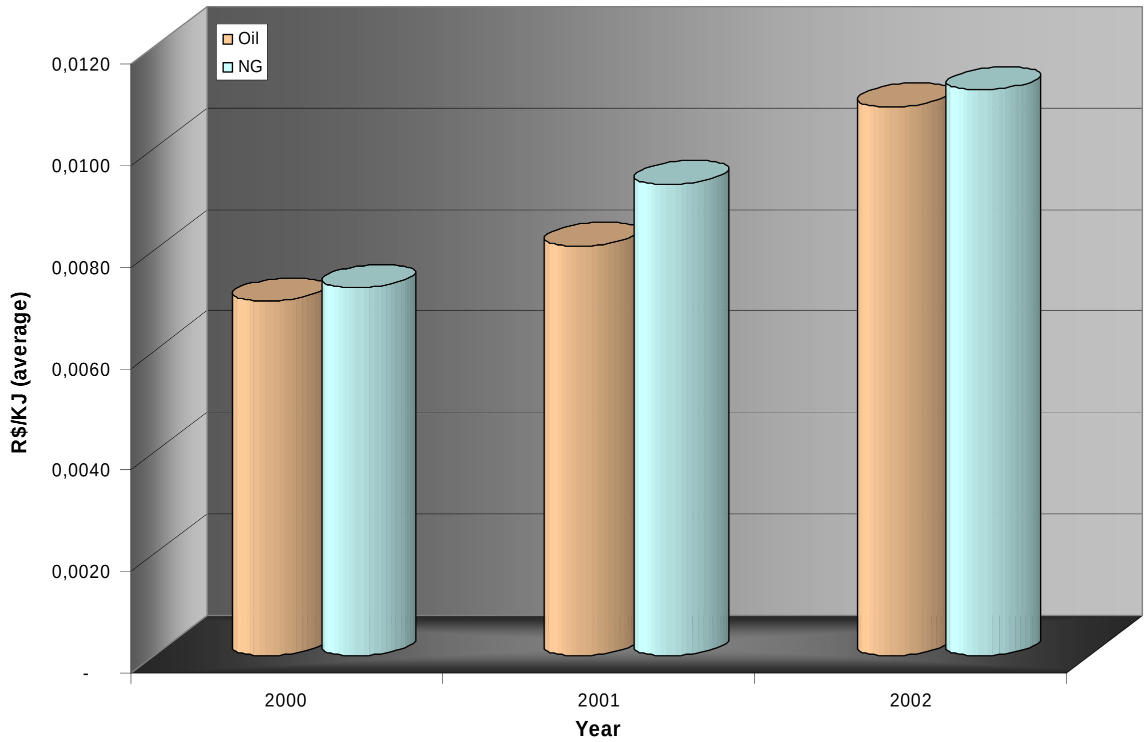
The initial condition related to additionality is the demonstration of absence of mandatory policy or regulations requiring the fuel switch. The project activity meets this first requirement. There are no policies requiring the fuel switch for the project developer or other companies in the sector or region. Moreover, all of the relevant environmental licenses do not present any requirements related to diminishing of air pollutants or more specifically, requirements for fuel switch.

(1) Investment/Financial Barrier:

Following the Meth-Panel recommendation, the data used to demonstrate additionality was based on the period prior to decision-making. This means the years 2000, 2001, and 2002 given that the decision was during 2002, and the project activity started in the beginning of March 2003.

The decision to make the fuel switch was made based on the average price of each of the fuels in the three years prior to the fuel switch (2000, 2001, 2002), in order to avoid an analysis based on instantaneous oscillations in fuel prices. The fuel oil average price was **0.0087**R$/kJ while the natural gas price was **0.0094** R$/kJ. Thus, the fuel switch represents a significant increase on the annual fuel bill per year. Based on observations of fuel price variation, it was not possible to predict if the current price structure would change (see Figure 2 below).

Figure 2 - Oil and Natural Gas Prices during Period 2000, 2001 and 2002: Prior to Project Decision-Making.



Moreover, the fuel switch requires investments for connecting the plant to the gas supply pipeline, internal pipeline installation (including labour, regulators, pumps and safety equipments), and equipment conversions from oil to gas (including labour, pipes, and connections). All these investments were estimated to sum approximately R$128,000.00.

The approval and registration of the project as a CDM activity, and the attendant benefits and incentives derived from the project activity, will help alleviate investment barriers and thus enable the project to be undertaken. The financial benefit from the revenue obtained by selling the CO_2 emissions reductions is one of the key issues that encouraged the developer to invest in the proposed project activity. CDM has been considered from an early stage and it is an integral part of the financial package of the proposed project activity (Marcelo Lima, *pers. com.*).

(2)Technical / Technological:

Not applicable**.**

(3) Prevailing Practice Barrier:

Not applicable.

(4) Others Barrier:

The implementation of the project activity also faced a barrier related with securing the supply of Natural Gas. For the implementation of this project activity some important parts of the boiler was changed, so if there is a sudden interruption in the supply of natural gas the production of $CaCO_3$ would stop. That scenario would never happen if the project activity continued to use fuel oil, since it can be stored. In order to better illustrate this barrier we could have two situations:

- The natural gas that CEG commercialize is not 100% extracted in Brazil it has a reasonable part that is produced in Bolivia, and any changes in the political scenario in the Bolivian government could affect the distribution of gas (a similar scenario happened in Graneros when Argentina reduced the amount of gas to Chile and they switched back to coal)
- There also could be interruptions in the supply due to replacement of the pipeline.

Furthermore, it is important to note that the main business of Quimvale is the production of $CaCO_{3,}$ thus, the decision to perform the fuel-switch required additional management effort and time, which was displaced from normal operations.

Therefore, it has been clearly demonstrated how the approval and registration of the project as a CDM activity, and the attendant benefits and incentives derived from the project activity, will alleviate the barriers indicated above and thus enable the project to be undertaken. It can therefore be clearly demonstrated that the proposed CDM project activity is not the baseline scenario.

Table below summarises the results of the analysis regarding the barriers faced by each of the plausible scenarios.

Table : Summary of Barriers Analysis.

Barrier Evaluated		Scenario 1 continuation of the usage of fuel oil	Scenario 2 implementation of the project activity with the fuel switch
1.	Financial / Economical	No	**Yes**
2.	Technical / Technological	No	No
3.	Prevailing Business Practice	No	No
4.	Other Barriers	No	**Yes**

To conclude, the barrier analysis above has clearly shown that the most plausible scenario is scenario 1 (continuation of current practices). Therefore, the project scenario is not the same as the baseline scenario.

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

The project boundary is the physical, geographical site where the fuel combustion affected by the fuel-switching measure occurs as stated by AMS- III.B. Thus, the project boundary of the Quimvale Project activity encompasses the physical, geographical area of the Quimvale installation.

The baseline is defined as what would have occurred in the absence of the project activity, which is the consumption of fuel oil for the production of $CaCO_3$ at the Quimvale installation. The baseline is based on the amount of CO_2 emissions occurring due to the fuel consumption. Additionally, the CH_4, and N_2O resulting from fuel combustion are not accounted for in the calculation of baseline and project emissions

Conforming to the guidelines and rules for small-scale project activities, the emissions related to production, transport and distribution of the fuel used in the power plants in the baseline are not included in the project boundary, as these do not occur at the physical and geographical site of the project. For the same reason, emissions related to the transport and are also excluded from the project boundary.

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

Please see Annex 3 for further details on baseline development.

For baseline calculations the data used is the most recent possible. Date of completion of baseline development is November 28, 2005.

EcoSecurities Ltd is the entity determining the Baseline and participating in the project as the Carbon Advisor. The person in charge of its development is:

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Ecosecurities do Brasil S.A
Rua Lauro Muller 116 /4303
CEP: 22290160
Phone: +55 (21) 2279 3651
e-mail: marcelo@ecosecurities.com

EcoSecurities is not a project participant.

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

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

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

01/03/2003

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

20 years

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

C.2.1. Renewable crediting period:

Not applicable

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

Not applicable

C.2.1.2. Length of the first crediting period:

Not applicable

C.2.2. Fixed crediting period:

The “Fixed Crediting Period” has been opted for the proposed project.

C.2.2.1. Starting date:

01/03/2003

C.2.2.2. Length:

10 Years

SECTION D. Application of a monitoring methodology and plan:

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

For project type AMS-III.B.-Switching fossil fuels, monitoring shall involve:

(a) Monitoring of the fuel use and output for an appropriate period (e.g., a few years, but records of fuel use may be used) prior to the fuel switch being implemented - e.g. coal use and heat output by a district heating plant, liquid fuel oil use and electricity generated by a generating unit (records of fuel used and output can be used in lieu of actual monitoring);

Monitoring fuel use and output after the fuel switch has been implemented - e.g. gas use and heat output by a district heating plant, gas use and electricity generated by a generating unit

From *Appendix B* of Simplified Modalities and Procedures for small scale CDM projects version 9, 28 July 2006.

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

Methodology III.B – Switching fossil fuels - It fits into the applicability requirements demanded by this category since the project involves a fossil fuel switch that both reduces anthropogenic emissions by sources and directly emits less than 15 kilotonnes of carbon dioxide annually.

Monitoring of the actual project activity shall involve:

- Monitoring of the historical oil consumption and $CaCO_3$ production data from 2001 and 2002 was utilized prior to the fuel switch being implemented was used in the development of the baseline.

- The consumption of natural gas after the fuel switch and the resulting production of $CaCO_3$ will be monitored (data from March 2003 till the end of 2004 was utilized to calculate the project activity emission and emission reductions). The production of $CaCO_3$ was chosen as the “output” variable since has been historically monitored and will remain so in the future (there is no proper steam production available for this project).

D.3 Data to be monitored:

Table 5 - Data to be Collected in Order to Monitor Emissions from the Project Activity

ID #	Data Type	Data Variable	Data Unit	Calculated (c) Indicated (I) or Measured (m), estimated (e	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper) How will the data	For how long is archived data kept?	Comment
D.3.1	Quantity of Fuel used at the process	Natural Gas	m^3	m	Continuous	100%	Electronic and paper	Project lifetime + 2 years	This will be monitored both through a gas meter and invoices
D.3.2	Production	$CaCO_3$	ton	m	Continuous	100%	Electronic and paper	Project lifetime + 2 years	Gas consumption will be related to the amount of $CaCO_3$ produced during the manufacturing process
D.3.3	Quantity of Fuel used at the process	Fuel oil in the baseline scenario	ton	m	Archive data	100%	Electronic and paper	Project lifetime + 2 years	Archived data will be used and records from 2001 and 2002.
D.3.4	Production	$CaCO_3$ in the baseline scenario	ton	m	Continuous	100%	Electronic and paper	Project lifetime + 2 years	Archived data will be used and records from 2001 and 2002
D.3.5	Net calorific Value	Natural Gas	$Kcal/m^3$	m	Continuous	100%	Electronic and paper	Project lifetime + 2 years	The natural gas supplier monitors NCV and density.
D.3.6	Density	Natural Gas	Ton/m^3	m	Continuous	100%	Electronic and paper	Project lifetime + 2 years	

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

Table 6 - Quality Control and Procedures

Data	Uncertainty level of data: (high, medium, low)	Are QA/QC procedures planned for these data?	Explain QA/QC procedures planed for these data, or why such procedures are not necessary
D.3.1	Low	Yes	Measuring instruments will be maintained regularly. The measurement of natural gas consumption is measured by the local seller.
D.3.2	Low	Yes	Measuring will be maintained regularly and will be subject to internal audits. Monitoring $CaCO_3$ production is part of there core business once they are $CaCO_3$ producers.
D.3.3	Low	Yes	Fuel consumption was subjected to internal audits.
D.3.4	Low	Yes	Monitoring $CaCO_3$ production is part of there core business once they are $CaCO_3$ producers.
D.3.5	Low	Yes	Measuring instruments will be maintained regularly. The measurement of natural gas NCV is measured by the local seller.
D.3.6	Low	Yes	Measuring instruments will be maintained regularly. The measurement of natural gas density is measured by the local seller.

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

The Project Developer will have a designated technician on site that will be responsible for monitoring emissions reductions of the project activity.

- The natural gas carried by pipeline is the only source of natural gas to the site, and thus it is easily quantified

- The data will be monitored and recorded by qualified technicians according to the monitoring plan.

- The data will be electronically archived.

Proper management process and routine procedures have been put in place already to ensure the quality of reports required by verification audits.

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

EcoSecurities Ltd is the entity determining the monitoring plan and participating in the project as the Carbon Advisor, and not a project participant. The person in charge of its development is:

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SECTION E.: Estimation of GHG emissions by sources:

E.1. Formulae used:

E.1.1 Selected formulae as provided in appendix B:

This is not applicable. No formula is provided.

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

Formulae are described below in section **E 1.2.1 and E.1.2.4**

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

As the fuel switch project uses natural gas as a source of energy for steam generation used in the production of $CaCO_3$, the project emissions are calculated based on the consumption of natural gas required for the production of $CaCO_3$, in 2004. Note: total relevant $CaCO_3$ production is based on approximately 10 months, in the year the fuel switch occurred (2003); hence the emission reductions calculated for 2003 in **Table 9**, are less than those in other years.

The formula used to calculate Project Emissions is:

(1) PE = (NG * EF_NG * dNG)

Where:

PE = the Project Activity Emissions (in t CO_2)

NG = the quantity of natural gas used in the project scenario (in m^3)
EF_NG = the CO_2 emission factor per unit of natural gas associated with fuel combustion (e.g., tCO2/t) - (this factor includes carbon oxidation %)
dNG = the density of natural gas (t/m^3)

Table 7 - Data used for the Calculation of the Estimated Project Activity Emissions

Variable	Data Source	Value
$CaCO_3$ Production	Quimvale Data (2004)	22,984 t/year
Natural Gas Consumption	Quimvale Data (2004)	6,248,000 m^3/year
Amount of $CaCO_3$ produced by one m3 of Natural Gas	Quimvale Historical Data	0,00368 t of $CaCO_3$/ m^3 Natural Gas
Natural Gas CO_2 Emission Factor	See Annex 3	2.06 $KgCO_2/m^3$
Natural Gas Density	Quimvale Data (2004)	0.000634 t/m^3

Project Activity Emissions Calculation:

PE = (6,248,000 * 2.06 * 0.000634)

PE = 8,160 t CO_2

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

This is not applicable as no leakage calculation is required.

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

8,160 t CO_2 are the annual small-scale project activity emissions.

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

As the fuel switch project uses natural gas as a source of energy for steam generation used in the production of $CaCO_3$, the baseline emissions are calculated based on the amount of oil that would have been required for the production of $CaCO_3$ (tons) in 2004.

The formula used to calculate the Quantity of Oil in the project scenario is:

(2) Oi = Ca / RCa_Oi

Where:
Oi = the quantity of Oil used in the baseline scenario (in t) per year
Ca = the quantity of $CaCO_3$ produced (in t) per year
RCa_Oi = the ratio of tons $CaCO_3$ produced by ton 1 ton Oil (from historical Quimvale data)

Quantity of Oil used in the Project Scenario Calculation:

Oi = 22,984 / 3.567

Oi = 6,442 tons

The formula used to calculate Baseline Emissions is:

(3) BE = Oi * EF_Oi

Where:
BE = Project activity emissions (in t CO_2)
Oi = the quantity of Oil used in the project scenario (in t) per year
EF_Oi = the CO_2 emission factor per unit of oil fuel associated with fuel combustion (e.g., tCO_2/t)-(this factor includes carbon oxidation %)

Baseline Emissions Calculations:

BE = 6,442 * 3.08

BE = 19,812 t CO_2

Table 8 - Data used for the calculation of the Baseline Emissions

Variable	Data Source	Value
$CaCO_3$ Production	Quimvale Data (2004)	22,984 t/year
Oil CO_2 Emission Factor	Brazilian energy Balance(2003)	3.08 tCO_2/t
Amount of $CaCO_3$ produced by one ton of Oil	Quimvale Historical Data	3.567 t of $CaCO_3$/ t of Oil

Therefore:
19,812 t CO_2 are the baseline emissions.

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

The formula used to estimate the Emission Reduction is:

(4) ER = BE – PE

Where:

ER = Emission reduction (tons of CO_2e)
BE = Baseline emissions (tons of CO_2e)
PE = Project activity emissions (tons of CO_2e)

ER = 19,812 – 8,160

ER = 11,652 t CO_2 annually

Note: Total emission reduction is calculated using the actual consumption of natural gas use in 2004, and applied to future years. The accurate emission reduction calculation for future years will be based on measured data during project activity.

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

Table 9 - Values Obtained When Formulae Applied in Section E

Year	Baseline Emissions (t CO_2)	Project Emissions (t CO_2)	Emission Reductions (t CO_2)
2003 (10 months)*	16,510	6,800	9,710
2004	19,812	8,160	11,652
2005	19,812	8,160	11,652
2006	19,812	8,160	11,652
2007	19,812	8,160	11,652
2008	19,812	8,160	11,652
2009	19,812	8,160	11,652
2010	19,812	8,160	11,652
2011	19,812	8,160	11,652
2012	19,812	8,160	11,652
2013 (2 months)*	3,302	1,360	1,942
Total (tons of CO_2)	**198,120**	**81,600**	**116,520**

***Note:** Total relevant $CaCO_3$ production is based on approximately 10 months, in the year the fuel switch occurred (2003), and the 2013 emissions are based on only 2 months.

SECTION F.: Environmental impacts:

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

The environmental authority responsible for licensing Quimvale activities did not request any environmental study for the fuel switch. Environmental impacts studies are requested only when the activity represents a significant impacts, thus there are no significant negative impacts related to project activity.

Table: Environmental licenses number for each unit.

Unit	Operational License number
Quimvale	License # 600/98 - FEEMA

SECTION G. Stakeholders' comments:

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

According to Resolution #1 dated December 2nd, 2003 from the Brazilian Inter-Ministerial Commission of Climate Change (Comissão Interministerial de Mudança Global do Clima -CIMGC), any CDM projects must send a letter with a description of the project and an invitation for comments by local stakeholders. In this case, letters were sent to the following local stakeholders:

- City Hall of: Barra do Pirai
- Chamber of Deputy of all municipalities;
- Environment agencies from the State and all municipalities;
- Brazilian Forum of NGOs;
- District Attorney (known in Portuguese as Ministério Público, i.e. the permanent institution essential for legal functions responsible for defending the legal order, democracy and social/individual interests) and;
- Local community associations.

Local stakeholders were invited to raise their concerns and provide comments on the project activity for a period of 30 days after receiving the letter of invitation.

The letters were posted on December 15, 2005. An electronic copy of the PDD version 01 was available at: www.quimvale.com.br, on December 15, 2005 .A written copy was sent as soon as requested.

As the project only involves the switch to natural gas in an existing facility, no stakeholders were significantly affected. In fact, the main stakeholder of the project is CEG-Rio, the gas supplier, whom has been involved in the CDM process from the beginning, and their parent company, Gas Natural, is a project participant. Nonetheless, all effects on the local environment are considered to be positive as the combustion of natural gas is cleaner.

G.2. Summary of the comments received:

To date, no comments have been received.

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

To date, no comments have been received.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

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Annex 2

INFORMATION REGARDING PUBLIC FUNDING

This project will not receive any public funding.

Annex 3

BASELINE INFORMATION

Specify the baseline for the proposed project activity using a methodology specified in the applicable project category for small-scale CDM project activities contained in appendix B of the simplified M&P for small-scale CDM project activities:

As stated in AMS-III.B, the emission baseline is the current emissions of the facility expressed as emissions per unit of output (e.g., kg CO_2equ/kWh). Emission coefficients for the fuel used by the generating unit before and after the fuel switch are also needed. IPCC default values for emission coefficients may be used.

The following table shows the key information and data used to determine the baseline scenario:

Sources	density (Kg/m^3)	lower heating value (Kcal/kg)	Net calorific value (TJ/Ktonne)	Carbon oxidation (%)	Carbon content (tC/TJ)	Carbon Emission Factor (tCO2/TJ)	Carbon Emission Factor (tCO2/fuel unit)	Fuel unit
charcoal	250	6,460	27.05	99.0%	-	-	-	t
coal coke		6,900	28.89	98.0%	-	-	-	t
diesel	840	10,100	42.29	99.0%	20.20	73.33	3.10	t
fuel oil	1,000	9,590(*)	40.15	99.0%	21.10	76.59	**3.08**	t
LPG	550	11,100	46.47	99.0%	17.20	62.44	2.90	t
natural gas	0.634	8,800(*) *	36.84 *	99.5%	15.30	55.82	**2.06**	$10^3 m^3$
petroleum	874	10,180	42.62	99.0%	20.00	72.60	3.09	t
petroleum coke	1,040	8,390	35.13	99.0%	27.50	99.83	3.51	t

* These values are in cubic meters.

Sources:

- (*) Brasilian energy Balance,2003
- CEG data
- IPCC 1996
- Calculated