CLEAN DEVELOPMENT MECHANISM
PROJECT DESIGN DOCUMENT FORM (CDM-SSC-PDD)
Version 03 - in effect as of: 22 December 2006

CONTENTS

A. General description of the small scale project activity

B. Application of a baseline and monitoring methodology

C. Duration of the project activity / crediting period

D. Environmental impacts

E. Stakeholders' comments

Annexes

Annex 1: Contact information on participants in the proposed small scale project activity

Annex 2: Information regarding public funding

Annex 3: Baseline information

Annex 4: Monitoring Information

Revision history of this document

Version Number	Date	Description and reason of revision
01	21 January 2003	Initial adoption
02	8 July 2005	• The Board agreed to revise the CDM SSC PDD to reflect guidance and clarifications provided by the Board since version 01 of this document. • As a consequence, the guidelines for completing CDM SSC PDD have been revised accordingly to version 2. The latest version can be found at <http://cdm.unfccc.int/Reference/Documents>.
03	22 December 2006	• The Board agreed to revise the CDM project design document for small-scale activities (CDM-SSC-PDD), taking into account CDM-PDD and CDM-NM.

SECTION A. General description of small-scale project activity

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

Reduction of energy consumption during the production of hydraulic lime for the construction industry through the addition of non-calcined mineral components and additives. – Cementos Avellaneda S.A.Olavarría, Buenos Aires. Argentina.

This Project Design Document has been modified on the basis of the preparation of a new specific baseline and monitoring methodology for the project activity, as a result of the consultation addressed to the CDM-EB Small Scale Working Group (SSCWG) which indicated that the approved AMS-II.D small-scale methodology previously used was not applicable to the alternative lime project at the Olavarría plant, in its version 0.1.

Version 0.4
January 2010

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

The project will be implemented in the Cementos Avellaneda S.A. (CASA) lime plant nearby the City of Olavarría, Province of Buenos Aires, Argentina. CASA has developed an innovation in its production process of hydraulic lime for construction purposes which reduces the consumption of energy during its production by adding Alternative Material[1] and additives.

The alternative lime manufacturing used in this CDM project is unique and is a great innovation in the lime industry, since it carries out the blending of Alternative Material and additives after a stage of calcination, allowing an increase in volume and reducing the energetic consumption per unit of final product. This technological innovation arises from the researches and tests carried out by the CASA´s Departments of Product Development, Project Engineering and Electricity.

The implementation of this project involves the following contributions to the Sustainable Development of the local community:

- Development and support of clean technologies: Cementos Avellaneda S.A. has researched and developed an innovative product based on a new process, which replace the baseline lime. With this initiative, CASA not only reduces the direct emissions of CO_2, but also serves to drive technologies in an increasingly clean way on the construction market.
- Generation of employment and formation of capacities: Upon dealing with a product that is unique in its type, CASA reinforces its commitment to the sustainable contribution of its operations, through the research and development of local capacities. Not only will it increase permanent jobs, but, since it involves a new technology, it will be necessary to educate and train personnel, thus contributing to increase knowledge in the local community.

[1] Alternative Material is a non-calcined mineral component. This Alternative Material, which mainly consists of limestone, is obtained from the same quarry of Cementos Avellaneda S.A. where limestone for calcination process is obtained.

- Reduction of Greenhouse Gas emissions: Upon reducing GHG emissions, this project contributes to the final aim of the United Nations Framework Convention on Climatic Change (UNFCCC) (ratified by Argentina in 1994).
- Reduction in electricity and fossil fuel consumption: Thus contributing to the preservation of non-renewable resources of the region.
- Reduction in water consumption: By reducing water consumption per unit of product, contributing to the preservation of the natural resource.

A.3. Project participants:

Name of Party involved (*) ((host) indicates a host Party	Private and/or public entity(ies) project participants (*) (as applicable)	Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No)
Argentina (host)	Cementos Avellaneda S.A.	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.		

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

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

>>

A.4.1.1. Host Party(ies):

Argentina

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

Buenos Aires

A.4.1.3. City/Town/Community etc:

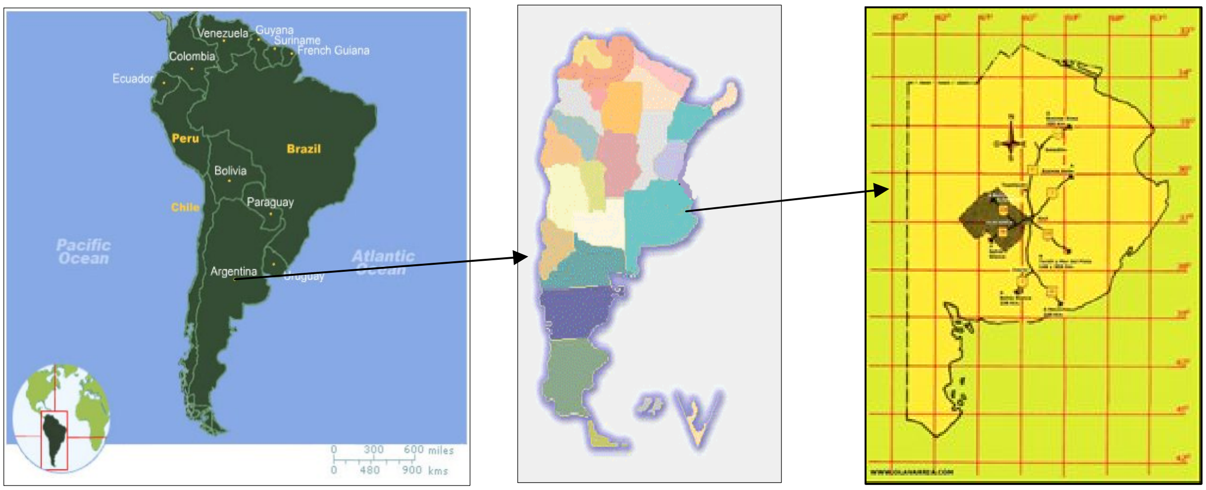
Olavarría

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

CASA’s plant is located in the district of Olavarría, Province of Buenos Aires, Argentina.

The district of Olavarría is located in the center of the Province of Buenos Aires (37°S., 60° O), some 350 Km from the Capital Federal. Its surface is 7715 km and it has approximately 100,000 inhabitants.

Olavarria is the chief city of the district and is located on National Route 226 and Provincial Route 51, some 40 km from National Route 3[2].



South America **Argentina** **Olavarría**

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

Type and category of the project activity

According to Appendix B of the simplified modalities and procedures for small scale CDM projects[3], this project falls under Type III - Other project activities.

A proposed new methodology entitled "Emission reduction in hydraulic lime production" was developed and it was approved in the 47 EB meeting.

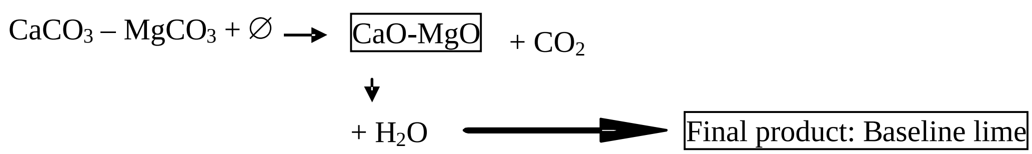
CASA is evaluating a process known as recarbonation. This process consists of the absorption of the CO_2 from the atmosphere into the lime through a reaction between CO_2 and Calcium Oxide in lime to form Calcium Carbonate. Studies made by CASA are proving evidence that the alternative lime has got a significant higher recarbonation capacity compared to baseline lime. Considering this evidence, CASA will continue researching the recarbonation mechanism of alternative and baseline lime, in order to include this issue in the CDM framework. Once CASA and/or the scientific community gather the necessary proves and evidences to show the successful performance of this mechanism, CASA will submit a revision of this methodology applying the procedures established by UNFCCC.

[2] http://www.olavarria.com/archivos/laciudad/geografia/index.php

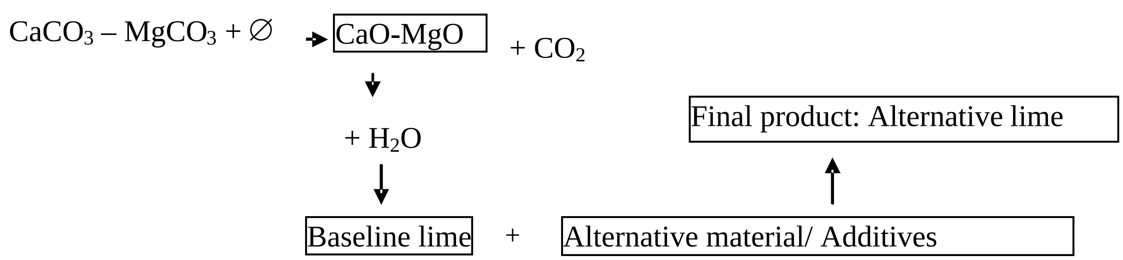
[3] http://cdm.unfccc.int/Reference/COPMOP/08a01.pdf#page=43

Technical description of the small scale project activity

Baseline hydraulic lime for construction purposes is produced by the reaction or the slaking of quicklime (CaO and MgO) with water, and consists mainly in calcium hydroxide ($Ca(OH)_2$). Quicklime is manufactured from a carbonate rock of calcareous origin with a certain purity –limestone-, which is calcined in kilns at high temperatures, which vary between 800°C and 1200°C, at these temperatures the limestone ($CaCO_3$ – $MgCO_3$) undergoes a process known as decarbonization, thus obtaining the quicklime or calcium oxide (CaO) as a result, and releasing the carbon dioxide (CO_2); this process requires a considerable amount of energy to calcinate the limestone.

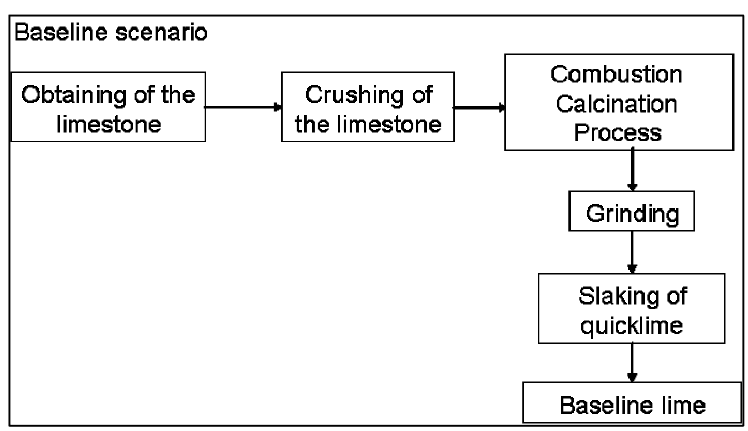


The incorporation of alternative materials (mainly limestone and possibly other inert minerals from limestone quarrying process) and additives, after the calcination process, allows an increase in the final product volume, neither increasing energy consumption nor emissions from combustion of fossil fuel.



<u>Technical description of baseline scenario</u>

1. Blasting of the quarry to extract the limestone (raw material)
2. Transport, storage and preparation of the limestone
    a. Crushing
    b. Screening
    c. Storage in limestone silos
3. Fuel supply for the kiln and preparation
4. Calcination of the limestone
5. Storage and crushing of the quicklime
6. Hydration of the quicklime
7. Storage, packaging, palletizing, stock and dispatch.

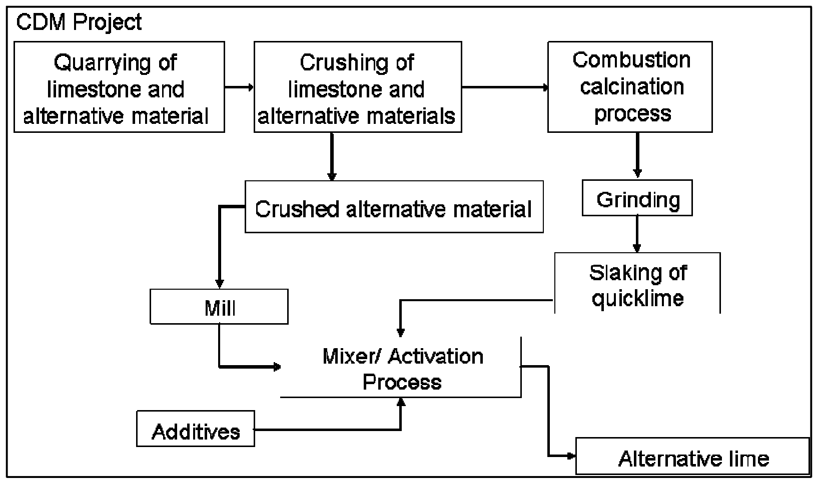


<u>Technical description of CDM project activity</u>

The manufacturing process of the alternative lime starts from the baseline lime to which are added the alternative materials and the additive.

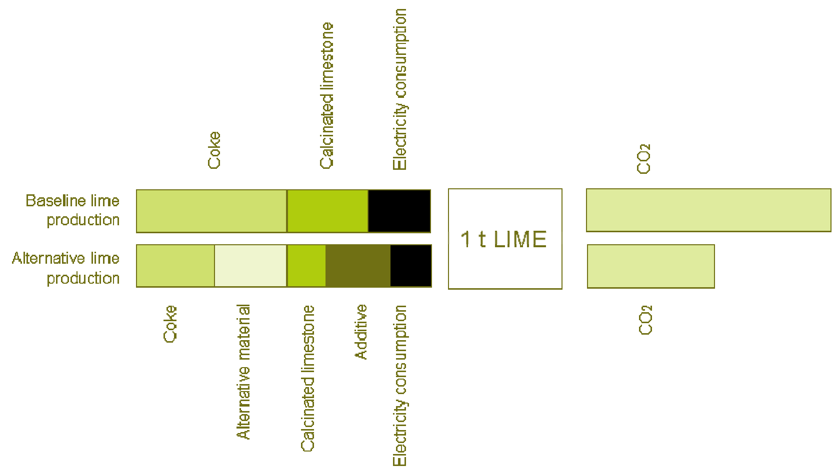
The crushed and ground alternative material is added to the baseline lime without going through the calcination process. Thus an increase in the volume of the final product is achieved, without expanding the capacity of the calcination kiln, and therefore, without increasing the use of fossil fuel.

Set out below are the stages that are added to the production process of the baseline lime, as a result of the current project activity:



8. The baseline lime, coming from the production system of the baseline scenario, will be transported pneumatically up to a series of metal silos located at new mixing equipment, where the alternative material will be added.
9. The alternative material arrives at the mixing silo from the stone mill, by pneumatic transport, which will be built as part of the current project.
10. The dosage of both materials will be performed through screw transporters, unloading the resulting material in weighing hoppers.
11. The unloading of these hoppers will feed a mixer, where the additive will be added gravimetrically, in order to obtain the desired properties in the final product (alternative lime).
12. The following stages are storage, packaging and palletizing. Finally it is transferred to the stock and dispatch warehouse.

The following graphic shows a materials balance between the baseline and alternative lime:



A.4.3 Estimated amount of emission reductions over the chosen crediting period:

Year*	**Annual estimation of emission reductions in tonnes of CO_2e**
2010	31 554
2011	34 227
2012	36 979
2013	39 815
2014	42 735
2015	45 743
2016	48 841
2017	52 033
2018	55 320
2019	58 290
Total estimated reductions (tCO_2 e)	445 537
Crediting period	10
Annual average over the crediting period of estimated reductions (tCO_2 e)	44 554

* *Note: * Using 12-monthly periods from the start of the crediting period.*

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

No public funding is involved in the present activity of the CDM project.

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

According to the paragraph 2 of Appendix C of the Simplified Modalities and Procedures for Small Scale Project Activities[4], this project is not a debundled component, since there is no other CDM project activity:

- By the same project participants;
- In the same project category and with the same technology,
- 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

This is the first and single CDM project in the Olavarria´s CASA Plant. The proposed project activity is not a debundled component of a large scale project activity. CASA is not planning to implement another project activity in the same site of this project activity, with the same technology and with the same project category.

[4] http://cdm.unfccc.int/Projects/pac/howto/SmallScalePA/sscdebund.pdf

SECTION B. Application of a baseline and monitoring methodology

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

Version 01 of AMS-III.A.D **-** Emissions reductions in hydraulic lime production.

(This methodology was proposed by CASA to SSWG, and it was approved in the 47 EB meeting).

B.2 Justification of the choice of the project category:

The project have a emission reduction which is within the eligibility limit of maximum 60 ktons CO_2 per annum for type III small scale project activity.

This project has an annual average of 44 554 tCO2/year.

Following the applicability conditions are explained and justified:

1. *This project category comprises alternative hydraulic lime production for construction purposes by blending a certain amount of conventional hydraulic lime with alternative material and additives. Production of hydraulic lime in the traditional manufacturing process requires more energy in comparison to the alternative lime process, since the addition of alternative material and additives reduces the amount of calcined material needed to develop the same properties per unit of final product.*

This CDM project activity fulfills to this first applicability condition.

2. *The project activity takes into account only emission reductions associated with the reduced energy consumption by increased level of blending. Decreased chemical release of carbon dioxide during calcination process is not taken into account. Other measures such as energy efficiency improvements should be considered as a separate project and may apply under Type II categories.*

This CDM project activity claims emission reduction for increased level of blending in hydraulic lime production.

3. The following definitions apply:

(a) Hydraulic lime: commercial product for construction purposes, obtained through the hydration of calcined limestone;

(b) Alternative hydraulic lime: commercial product obtained through blending of a certain amount of hydraulic lime with alternative material and additive, showing similar properties and same applications as the conventional hydraulic lime;

(c) Alternative material: non-calcined mineral components comprising limestone and/or other inert materials obtained from a quarry. Examples of non-calcined mineral components include certain types of limestone, dolomite and marbles;

(d) Additive: solid or liquid material added to the blended product in small quantities, (less or equal to 0.05 tonne-additive/ tonne alternative hydraulic lime) which notably change its properties.

This CDM project activity fulfills to this applicability condition.

4. This methodology is only applicable if the service level of alternative hydraulic lime is the same or better than the hydraulic lime, i.e. the product obtained during the crediting period shall meet or exceed relevant properties of typical commercial hydraulic lime for construction purposes/applications, measured in accordance with an applicable or related standard[5]. Standard tests shall be carried out on statistically valid number of samples of project lime[6] (see paragraph 24 below).

Both alternative lime and baseline lime are part of a group of limes used for construction. CASA performed a series of tests (field tests) to evaluate the performance of alternative lime compared to baseline lime and to ensure comparable or better level of service as the baseline product in construction applications.

These tests were based on the production of mortars and developed with a particular dosage (volume) of sand. The parameters evaluated as prime aspects to be considered for construction with lime were:

- Appearance
- Plasticity or workability
- Adhesion to bricks
- Plasterwork, water repellent
- Plasterwork, slaked
- Plasterwork, finish

These studies and tests demonstrate the performance of alternative lime and ensure a comparable or better level of service as baseline lime and will be available for evaluation through DOE (Designated Operational Entity) and the Executive Board (EB)-CDM.

5. The maximum blending level in the project activity is:

(a) Alternative material: 0.70 (t alterative material/t alternative hydraulic lime);

(b) Additive: 0.05 (t additive/t alternative hydraulic lime).

---

[5] In case where a national standard for testing hydraulic lime quality does not exist, an international standard or standard from another country shall be used as a reference (e.g. International Lime Association).

[6] If confidential data are used, the performance evaluation of alternative lime shall be verified by the DOE and the EB-CDM along validation/verification process.

This CDM project activity fulfills to this applicability condition.

6. It shall be demonstrated in the PDD that there is no other allocation or use for the amount of alternative material used by the project activity, and there is enough availability of it during the crediting period. If alternative material is purchased from other quarry owners, the procedure described in paragraph 3 of AMS-III.V may be used.

CASA is the owner of the limestone quarry, where limestone is extracted to produce lime in baseline and project scenarios. Limestone is an abundant material in the region of the project activity. There are a minimum of verified reserves and a lifetime for more than 60 years for CASA and others lime manufacturer in the region.

7. This methodology is only applicable to a project activity implemented in an existing plant. It shall be demonstrated that the alternative hydraulic lime was not produced in that plant for at least the previous three years.

The CASA Olavarria Plant is an existing lime plant, which is operating since 1919 and alternative lime was never used before this CDM project activity.

8. This methodology is limited to domestically sold output of the project activity plant and excludes export of alternative hydraulic lime.

Alternative lime of this CDM project activity is sold to domestically market only.

9. Adequate data are available on baseline hydraulic lime application in the market and relevant quality standards per application.

Alternative lime has been specially designed for application in the construction market. In the lime sector, two very different markets exist, both from the sales strategy to the specific characteristics of end use. These markets are:

- Lime for construction;
- Lime for industry.

There are significant differences related to the sales strategy applied for each of these markets:

- Lime for construction for delivering is packaged in bags.
- Lime for specific industrial applications for end production is delivered in bulk.

Different sales strategies likewise exist in function with the market and the end user:

- Construction market: large-volume customers, mostly sold through wholesale distributors and retailers (for example, construction supply depots).
- Industrial market: available through direct sale.

Cementos Avellaneda has traditionally supplied the construction market with lime, which accounts for more than 96% of its sales.

Alternative lime is earmarked for the construction market and thus planned to be sold packaged in bags commonly available in construction supply depots. This information is available to be validated by the DOE and by the EB-CDM through sales records maintained by the Sales Department of CASA.
More information about lime market is in section B.5.

10. In order to exclude double counting, CERs can only be claimed by the producer of alternative hydraulic lime.

The company Cementos Avellaneda S.A. is the organization that will produce alternative lime so it legitimizes the possession of CERs.

11. This methodology is not applicable if local regulations require the use of proposed technologies for the manufacturing of alternative hydraulic lime.

There are no local regulations in Argentina that require the use of alternative lime technology (in fact this project is the "first of its kind").

B.3. Description of the project boundary:

As established by the methodology the project boundary includes all physical, geographical sites where:

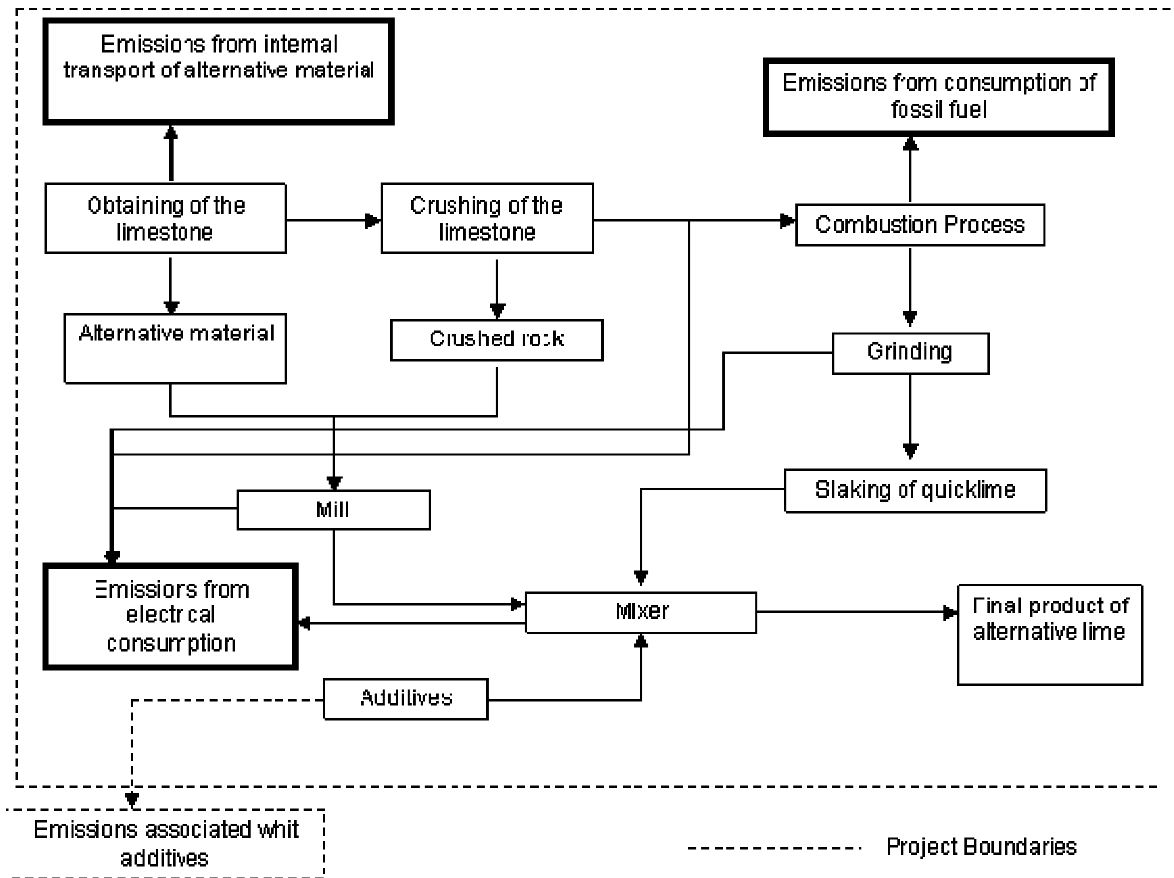
a) Alternative hydraulic lime is produced;
b) Transportation of alternative material is conducted;

The following table shows the GHG sources taken into account in the project:

	Source	Gas	Included?	Justification / Explanation
Baseline	Fossil fuel used in the calcination kiln	CO_2	Yes	Direct emissions coming from the burning of fossil fuel used in the calcination kiln.
		CH_4	No	Not taken into account. Excluded for simplification. CH_4 and N_2O emissions are assumed to be very small.
		N_2O	No	
	Electric energy used in the production process	CO_2	Yes	Direct emissions arising from the use of electricity.
		CH_4	No	Not taken into account. Excluded for simplification. CH_4 and N_2O emissions are assumed to be very small.
		N_2O	No	
Project Activity	Fossil fuel used in the calcination kiln	CO_2	Yes	Direct emissions coming from the burning of fossil fuel used in the calcinations kiln.
		CH_4	No	Not taken into account. Excluded for simplification. CH_4 and N_2O emissions are assumed to be very small.
		N_2O	No	

	Source	Gas	Included?	Justification / Explanation
	Electric energy used in the production process	CO_2	Yes	Direct emissions coming from the use of electric energy.
		CH_4	No	Not taken into account. Excluded for simplification. CH_4 and N_2O emissions are assumed to be very small.
		N_2O	No	
	Energy consumption for alternative material transport	CO_2	Yes	Direct emissions coming from the use of electric and thermal energy for transportation.
		CH_4	No	Not taken into account. Excluded for simplification. CH_4 and N_2O emissions are assumed to be very small.
		N_2O	No	
	Emission from additives	CO_2	Yes	The emissions associated with additives are considered as leakage since it is not under the control of the project proponent. But they are considerer as leakage.
		CH_4	No	Not taken into account. Excluded for simplification. CH_4 and N_2O emissions are assumed to be very small.
		N_2O	No	

The following chart identifies the sources of emission included within project boundaries:


Emissions from internal transport of alternative material
Emissions from consumption of fossil fuel
Obtaining of the limestone
Crushing of the limestone
Combustion Process
Alternative material
Crushed rock
Grinding
Slaking of quicklime
Mill
Emissions from electrical consumption
Mixer
Final product of alternative lime
Additives
Emissions associated whit additives
Project Boundaries

B.4. Description of baseline and its development:

According to the AMS-III.A.D methodology, baseline scenario is defined as follows*:*

> *"Baseline scenario is the production of the same quantities of alternative hydraulic lime by the project activity, using the conventional process".*

According to the AMS-III.A.D methodology:

> *"The project activities involving increases in capacity compared with a baseline scenario are eligible only if in compliance with the relative and relevant conditions of the General Guidance Document for small-scale methodologies requiring demonstrating that the baseline scenario for additional capacity is the same as the baseline scenario defined by this methodology".*

The document entitled *"Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories*[7]*"* establishes in its paragraph 16 that the projects anticipating an increased capacity shall apply Steps 1 to 3 of the "Combined Tool to identify the baseline scenario and demonstrate additionality".

In section B.5 of this PDD the Combined Additionality and Baseline Tool is applied to demonstrate the increased baseline capacity scenario.

The baseline scenario of this project consists in the baseline hydraulic lime production expansion through the traditional production technology. In view of the unsatisfied demand for this product in the Argentine market[8], in the absence of a CDM project this demand would have been met increasing the productive capacity with the baseline technology.

This means that in the absence of this CDM project activity, the existing lime production facilities would have increased capacity using the baseline technology with energy consumption associated with this technology ($EC_{FF,i,HL}$ and $EC_{el,HL}$) at historical average levels during the 2006-2008 years, which would translate into an increase in CO_2 emissions in proportion to the increase in production ($Q_{Al,cap,y} = Q_{AL,y}$).

To make initial estimates of emission reductions, the projected alternative lime production has been estimated on the basis of the market demand studies conducted by Cementos Avellaneda S.A.[9]

According to the AMS- III.AD methodology, baseline emissions (BE_y) in the year *y* shall be determined by selecting the lower value from the calculation of ex – ante and ex – post baseline emissions.

- Ex – ante BEy are calculated for year "*y*" based on the historical average (thermal and electric) energy consumption for the last 3 years (Q_{HL}).

---

[7] http://cdm.unfccc.int/Reference/Guidclarif/ssc/methSSC_guid06_v12.pdf

[8] The market study performed by Cementos Avellaneda S.A. is confidential, but will be available for verification by the DOE and the CDM-EB.

[9] The market study performed by Cementos Avellaneda S.A. is confidential, but will be available for verification by the DOE and the CDM-EB.

– Ex – post BEy are calculated for each year "*y*" based on real (thermal and electric) energy consumption measured for the production of baseline hydraulic lime as an intermediary product for the production of alternative hydraulic lime (Q_{IHL}).

As $Q_{AL,cal,y} = Q_{AL,y}$ y $Q_{IHL,y} = Q_{HL}$ the values for $_{ex-ante}$ BE and $_{ex-post}$ BE are the same.

To estimate the emission reduction in this document the $BE_{ex-ante,y}$ has been used. During the project activity the baseline for each year "y" shall be recalculated following the procedures provided by the AMS-III.A.D methodology and selecting the lower of the two values for BE from the calculation of ex – ante and ex –post.

The following equations have been used to establish the baseline scenario:

$$BE_y = Minimum\left(BE_{ex-ante,y}, BE_{ex-post,y}\right) \quad \textbf{(1)}$$

Where:

$BE_{ex-ante,y}$ = Baseline emissions based on *ex ante* specific emission factor per tonne of hydraulic lime produced (tCO_2).

$BE_{ex-post,y}$ = Baseline emissions calculated based on *ex post* specific emission factor per tonne of hydraulic lime produced as an intermediate product before blending (tCO_2).

$$BE_{ex-ante,y} = \frac{\sum_i EC_{FF,i,HL} * EF_{FF,CO2,i} + EC_{el,HL} * EF_{el,CO2}}{Q_{HL}} * Q_{AL,cap,y} \quad \textbf{(2)}$$

Where:

$EC_{FF,i,HL}$ = Historical annual average consumption of thermal energy using fossil fuel type *i* to produce baseline hydraulic lime (GWh_{th}/year). Historical annual consumption of each fuel type *i* (volumes, mass) during the three most recent years, multiplied by the respective net calorific value (NCV_i) are used for the determination of the average $EC_{FF,i,HL}$.

$EF_{FF,CO2,i}$ = CO_2 emission factor of the fossil fuel *i* (tCO_2/GWh_{th}).

$EC_{el,HL}$ = Annual average consumption of electricity to produce hydraulic lime in the previous three years (GWh_{el}/year).

$EF_{el,CO2}$ = CO_2 emission factor for electricity consumption (tCO_2/GWh_{el}).

Q_{HL} = Historical annual average production of baseline hydraulic lime in the three most years (tonne/year, dry basis).

$Q_{AL,cap,y}$ = Total production of alternative hydraulic lime of the project activity in the year *y* (tonne, dry basis).

$$BE_{ex-post,y} = \frac{\sum_i EC_{FF,i,IHL,y} * EF_{FF,CO2,i} + EC_{el,IHL,y} * EF_{el,CO2}}{Q_{IHL,y}} * Q_{AL,cap,y} \qquad \textbf{(3)}$$

Where:
$EC_{FF,i,IHL}$ = Thermal energy provided by the fossil fuel type *i* to produce hydraulic lime as an intermediate product (before blending) in year *y* (GWh_{th}).

$EC_{el,IHL,y}$ = Consumption of electricity to produce hydraulic lime as an intermediate product (before blending) in year *y* (GWh_{el}).

$Q_{IHL,y}$ = Production of hydraulic lime as an intermediate product (before blending) in year *y* (tonne, dry basis).

All variables, parameters, data souces and information used in baseline calculation are exposed in seccion *B.6.2. Data and parameters that are available at validation* and Annex 3 of this document.

Date on which the draft of the baseline was completed: 18/05/2009

The baseline and new methodology AMS-III.AD "Emission reductions in hydraulic lime production**"** was prepared by:
PricewaterhouseCoopers
Tel: +54 11 4850 6816
Fax: + 54 11 4850 6100
Contact: Marcelo Iezzi, marcelo.iezzi@ar.pwc.com

B.5. 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:

According to the AMS-III.A.D methodology:

> *"Project activities involving capacity additions compared to the baseline scenario are only eligible if they comply with the related and relevant guidance in the General Guidance for SSC methodologies which require a demonstration that the baseline scenario for the added capacity is the same as the baseline scenario defined by this methodology".*

The document entitled *"Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories*[10]*"* establishes in its paragraph 16 that the project anticipating an increased capacity shall comply with the following requirements:

> *"Capacity increase: Type II and III project activities involving capacity increase may use a Type II and Type III SSC methodology provided that they can demonstrate that the most plausible baseline scenario for the additional (incremental) capacity is the baseline provided in the respective Type II and III small-scale methodology. The demonstration should include the assessment of the alternatives of the project activity. For the purpose of the demonstration, project participants may apply the Steps 1 to 3 of the latest version of "Combined tool to identify the baseline scenario and demonstrate additionality" to identify the baseline scenario. If the identified baseline scenario for the additional (incremental) capacity is the same as the baseline of the methodology, and it can be demonstrated that the implementation of the project as 'the proposed project activity undertaken without being registered as CDM', is not the common practice in the region, project participants can apply the respective methodology. If the most plausible scenario for the additional capacity is the project activity, the baseline emissions are considered only to the extent of the capacity of the facility, which is being replaced."*

According to this guidance, Steps 1 to 3 of the Combined Additionality Tool have been taken to determine the baseline scenario and demonstrating additionality of this CDM project.

<u>Step 1: Identification of alternative scenarios</u>

This Step allows identifying all the alternative scenarios to the proposed CDM project activity which may be the baseline scenario, through the following Sub-Steps:

<u>Sub-Step 1a: Definition of alternative scenarios to the proposed CDM project activity</u>

The baseline to be considered depends on the expected evolution of the lime market, that is, if the market dynamics justifies an increase in the industry productive capacity as a whole. Below are proposed four alternatives: two alternatives corresponding to the production increase scenario and two alternatives suitable for a scenario in which the current production levels would be maintained.

In each of these scenarios, the alternative to the CDM project activity is the common practice in the industry, that is, the use of the traditional technology in the production of the lime volumes estimated for each production scenario in the industry.

Alternatives	Objective	Description
Scenarios: Without Production growth		

[10] http://cdm.unfccc.int/Reference/Guidclarif/ssc/methSSC_guid06_v12.pdf

Alternatives	Objective	Description
Alternative 1	Statu Quo: no production growth	Common Practice: Continuation of current level of lime production using: 1. traditional *technology* and 2. full usage of kiln installed *capacity*
Alternative 2	Alternative lime production without production growth	The first of its kind: Continuation of current level of lime production, but using: 1. alternative *technology* and 2. idle capacity of installed kiln *capacity*
Scenarios: With production growth		
Alternative 3	Hydraulic lime production expansion with traditional technology	Common Practice: hydraulic lime (baseline lime) production expansion by baseline technology, for which it is necessary to expand the installed capacity of the limestone calcination kiln thereby increasing the consumption of fossil fuel.
Alternative 4	Alternative hydraulic lime production expansion with new technology without CDM	The first of its kind: Alternative lime production expansion through a change in the production process by adding alternative material and additives, without expanding the installed capacity of the calcination kiln.

Below is a separate analysis, in the first place, of the industry evolution scenarios. This analysis enables concluding that the industry needs to expand its productive capacity, given the unsatisfied demand existing in the Argentine market.

Second, an examination is made to determine which technology should be used in each of these scenarios, analyzing the hydraulic lime production common practice in the relevant region.

The combination of the two analyses allows demonstrating that the baseline scenario matches Alternative 3 mentioned in the foregoing table.

		Technology	
		Traditional Technology – Common Practice	CDM Project – The first of its kind
Growth scenario	Present capacity	Alternative 1	Alternative 2
	Increase in capacity	Alternative 3	Alternative 4

Baseline scenario (Alternative 3)

a. Analysis of the industry evolution scenarios

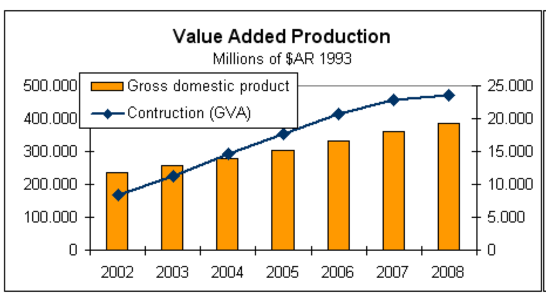
There are no disaggregated statistics for the lime industry in Argentina. However, various situations in the local market permit identifying a need to expand the productive capacity in the industry.

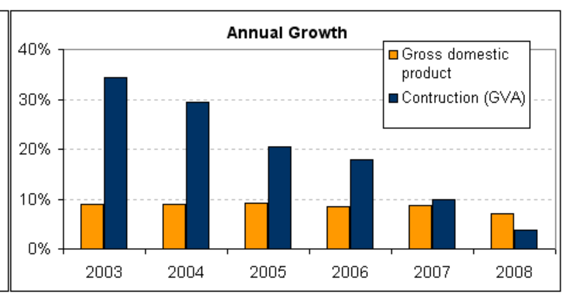
a.1 Evolution of the demanding sectors

Construction sector

Although there are no disaggregated statistics, consumption of hydraulic lime is highly correlated with the evolution of the construction activity as lime is an essential input at different stages of the work projects (subfloors, mansonry, stucco, etc.).

The recovery of the Argentine economy after the 2001 crisis has largely been due to the construction industry. As shown by the following charts, over the last 6 years the construction industry grew at rates higher than the Gross Domestic Product, with an accumulated increase of 110%.





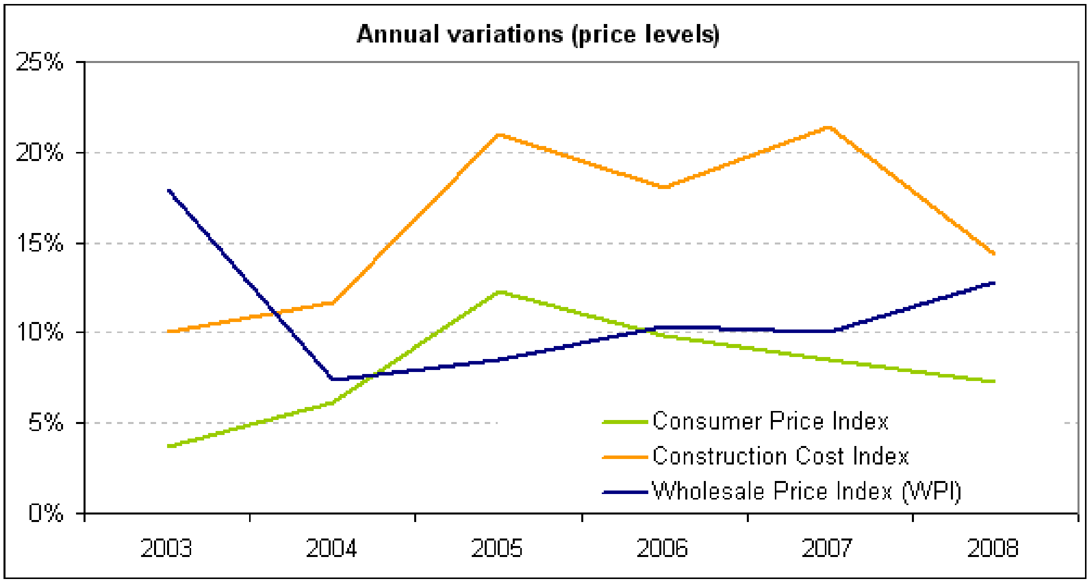
Source: National Institute of Statistics and Census (Indec)[11]

Correspondingly, hydraulic lime production for construction has grown at an average annual rate of 7%. Therefore, the Alternatives to be considered involve an installed capacity expansion in the industry to respond to this huge market demand.

In general, when a significant growth in demand, as shown by the foregoing tables, is not accompanied by the corresponding increase in supply, it exerts pressure on prices and causes them to rise. The Argentine economic development in the last few years is an example of this economic dynamics.

[11] www.indec.gov.ar

The following table shows the evolution of retail, wholesale and construction price levels. It is easy to note that from the year 2004 to the present, the prices in the construction sector grew at a faster pace than the general prices in the economy, both at retail and wholesale levels. This is indicative of a heavy demand in the sector and its consequent pressure on prices.



Source: National Institute of Statistics and Census (Indec)

<u>Public work-oriented construction industry</u>

As sustained by a Report of the Argentine Chamber of Construction[12] the lime market appears as a constraint on the construction industry expansion process and on the full implementation of the plan devised by the Argentine Highway Association, together with the hydraulic and sanitation plans.

The objective of this report is to "analyze the Capabilities and Problems of the Infrastructure Construction Industry to define the basic elements that will enable the construction industry to absorb the necessary sustainable work plans, without causing a bottleneck in demand, with the consequent price increases, delays in works and low quality. The report thus seeks to analyze this market to study its ability to respond to the increased demand for infrastructure works, all this bearing in mind the position of the construction industry in the Argentine economy, and the importance of generating a sustained infrastructure investment plan."

Based on the analysis of the sector needs to deal with public work plans in Argentina, the report sustains that "from the standpoint of business competitors, the construction sector is in a position to absorb increasing infrastructure investment levels, and has to focus in this case on the possible inputs to take such a quantum leap".

---

[12] Argentine Chamber of Construction, April 2006. "Study of the Capabilities and Problems of the Infrastructure Construction Industry. Final Report". http://www.camarco.org.ar/DL_Publicaciones/Estudio%20de%20las%20Capacidades%20y%20Problemas%20de%20la%20Industria%20de%20la%20Construcción/Capac%20InstaladaINFORME%20FINAL.pdf

In analyzing the needs to develop the plan devised by the Argentine Highway Association, together with the hydraulic and sanitation plans, it is concluded that "the plan is relatively more rigid in the basic inputs for construction market. The constraints according to the present production are broken stone and asphalt cement and, to a lesser extent, the lime production"[13].

Lime demand

Furthermore, according to surveys conducted by Cementos Avellaneda among its wholesale customers, more orders for lime for construction have been placed since 2004 than the ones that producers are able to deliver according to their present installed capacities. This is a direct indicator of an unsatisfied market demand in the province of Buenos Aires and adjacent areas. As mentioned earlier, there are no recorded official or sectoral data on the growth in lime for construction demand, as this is a very atomized sector with different degrees of formal data registration. However, if the growth in the cement market, which is closely related, is taken as an indicator it is concluded that the lime demand has expanded substantially without a counterpart in relevant production investments. Average cement consumption growth was 18% per annum over the last four years. Between 2004 and 2007 dispatches increased more than 50%, exceeding by more than 30% historical record consumption in 1998 and 1999 (prior to the 2001 crisis), when lime productive capacity had already been at its peak. Extrapolating this data to the lime for construction market, it is estimated that in recent years there has been an increasing unsatisfied demand of around 30% (all data have been downloaded from the website of the Argentine Portland Cement Manufacturers Association, http://www.afcp.org.ar).

a.2. Response of the lime supply in the Argentine market

Growth in demand is a concomitant of a corresponding supply response. In view of the activity increase scenario in the sectors using lime as one of their main inputs, the main suppliers have dealt with this situation operating at their full initial capacity and subsequently making investments for its expansion.

- Operation at full installed capacity at the Cementos Avellaneda plant

Cementos Avellaneda has been operating at full installed capacity since 2004[14].

- Investments by competitors

Likewise, the increased capacity is not exclusive to Cementos Avellaneda S.A.; rather, it extends to its main competitors.

- Minera Tea, for example, increased its installed capacity by 50%, which accounted for an increase of 10% in productive capacity in the Province of San Juan[15].
- In October 2007, Cefas S.A. resumed the installation of a kiln it had started in 1999 and suspended in 2001 as a result of the Argentine crisis. This kiln will permit Cefas to double its production from 7,000 to 15,000 tonnes/month and enter the construction market[16].

[13] Page 175 of the Argentine Chamber of Construction Report

[14] Cementos Avellaneda has supporting documentation available on its information systems, which will be delivered at the moment of the validation.

[15] http://www.editorialrn.com.ar/index.php?option=com_content&task=view&id=2068&Itemid=39

- Additionally, Unimin, which purchased the limekilns from Minera Tea in Albardón and from La Buena Esperanza in Sarmiento, has announced that it will invest in projects for the expansion and improvement of the two limekilns[17].

b. <u>Analysis of other technologies used in the production of hydraulic lime for the construction industry in Argentina</u>

According to the "Combined tool to identify the baseline scenario and demonstrate additionality", Sub-Step 1a must include an analysis of other technologies that are used by the industry to supply top quality goods or services and properties comparable to the project activity.

The current Argentine lime market is highly atomized. There is a large number of small producers (family businesses or small and medium-sized enterprises) which jointly account for only 30% of market production. The remaining 70% is produced by three large companies: Cefas S.A, Cementos Avellaneda S.A. and Loma Negra S.A.

The analysis of 10 cases of lime producers in Olavarría and in Argentina allows concluding that both the top-loading shaft kilns and the use of petcoke as fuel are usual production modalities. In general, the large producers make good use of energy sources, as compared with the technology used by small lime producers.

The 10 cases analyzed are the following:

- C.E.F.A.S. S.A - Olavarría
- Loma Negra Ruta 226 km 281 – Olavarría
- Calera Cerro Indiano S.R.L. - Olavarría
- Calera Blockal S.R.L. - Olavarría
- Peña Dura S.A. - Olavarría
- Buglione y Martínez – Olavarría
- Polcecal S.A. -Olavarría
- BTZ MINERA – San Juan
- FRICONST S.R.L. FRIAS Santiago Del Estero
- SUMAMPA S.R.L. S. M. de Tucumán

The abovementioned investment recently made by Minera Tea is, for example, a double shaft parallel-flow kiln, with an upper limestone feed.

Hence, the proposed project activity is not common practice in Argentina; it is a novelty developed by CASA within the framework of this CDM project. Alternative lime for construction purposes has a service level and characteristics similar to the baseline lime produced by CASA, as well as by the other producers, but with a net CO_2 emission reduction per final unit of product.

<u>Result of Step 1a:</u>

[16] http://diariohuarpe.ar60.toservers.com/h_nota.asp?id=18684

[17] http://www.eldiariodelarioja.com.ar/noticia.asp?id=35140

It is then concluded that Alternatives 3 and 4 corresponding to a capacity increase scenario in the industry are the ones which persist after their analysis as viable Alternatives. Consequently, the possible Alternatives are the following:

1. *Alternative 3*: Increase in the hydraulic lime productive capacity with the traditional technology (Common practice)
2. *Alternative 4*: Increase in the productive capacity with the new technology without CDM (The first of its kind)

Sub-Step 1b: Consistency with applicable laws and regulations

The two Alternatives are consistent with the laws and regulations applicable in Argentina.

Step 2: Barrier Analysis

The purpose of this Step is to identify the barriers and analyze which Alternatives are prevented by these barriers.

Sub Step 2a: Identification of barriers that prevent Alternatives from being implemented

Below is presented a list of the barriers that could prevent any of the Alternatives from being implemented.

Technological barriers

The particular technology used in the proposed project activity is not available in the relevant geographical area.

In order to be able to implement the technology of the project associated to the Alternative 4 the Engineering and Electricity Departments of Cementos Avellaneda will take the following steps, among others:

- Research and development of product.
- Conditioning of the existing grinding plant;
- Installation of dosage equipment for raw material according to the developments in CASA;
- Installation of a new mixing equipment, with its corresponding automatic and remote controls, developed by CASA.
- Installation of a new dispatch facility.

The logic control, the remote control and the automation of the dosage systems for the mix components have been totally developed and implemented under PLC (Programmable Logic Controller) and HMI (Human-Machine Interface) technologies, SCADA system (Supervisory Control And Data Acquisition), designed, assembled and programmed by the Department of Electric Engineering (DEE) of Cementos Avellaneda S.A., since there is no product control or proper know-how for this application on the market.

Therefore, as it is a new technology that is not available on or outside the geographically relevant area, this project faces certain technological barriers relating to the following aspects:

- There is a higher risk of failure than that faced by other technologies for the production of lime in the market. The new technology proposed has never been tested, and since it is a material for construction, some of the flaws can only be detected when the product is exposed to certain specific construction applications (resistance to abrasion, appropriate color and stability, mechanical resistance in general, etc.). To avoid these situations, the company has developed a series of field tests and has established a quality monitoring system which will help to avoid failures. As there are no similar technologies for reference on the market, a large number of technical and engineering tests were carried out.
- A greater investment in Research & Development will be required as also a marketing strategy for promotion, since the alternative lime is a novel product launched by CASA, and it runs the risk of not being accepted by the users, even though the alternative lime has a better level of service than the baseline lime in construction applications.
- The technicians and operators must be trained to handle the new technology.
- It incorporates the importation of additives that are not used with the traditional technology, which generates certain logistic, and storage difficulties as well as significant dependence on the price of the product that contains imported material, considering that lime market it is an entirely local market. Exchange rate instabilities could diminish competitiveness of the alternative product in comparison to the baseline product, which is entirely manufactured with local inputs.

Lack of prevailing practices

The alternative is the "first of its kind".

Traditional technology is the prevailing practice in the production of hydraulic lime for construction purposes in the Argentine Republic. As explained in the preceding sections, if the production capacity increase is carried out with the technology associated to the common practice, it would have caused a higher level of emissions of GHG in comparison to the other alternative.

As mentioned in the preceding section – "Technological Barriers" – there is no venture with this CDM project technology at local or international level, so it can be called "*the first of its kind*".

As background for the "*the first of its kind*" alternative, CASA has made several requests for patents[18]. The first request was made to the Argentine Office on February 27, 2006, and then several requests were made in countries of the region and the world. Additionally, the project proponents have presented the Note of Idea of the Project (PIN - due to its initials in Spanish-) to the Environmental and Sustainable Development Secretariat of Argentina (SAyDS – due to its initials in Spanish) during the month of April 2005. Also, in the Minutes Book of the meetings of the Board of Directors, the minute of March 2007 indicates the consideration of the CDM characteristic before deciding the investment on this particular project activity.

Sub Step 2b: Elimination of alternative scenarios that are not possible to implement because of the identified barriers

The analysis of barriers showed that in view of its departure from the predominant practice, this CDM project will face numerous predominant practice and technological barriers which would not be faced if the traditional technology were applied.

[18] This document is confidential, but will be available to verified by the DOE and the CDM-PDD

The predominant practice and technological barriers identified during the application of the additionality tool to this CDM project activity show that the plant capacity expansion scenario is difficult to execute with the new technology –Alternative 4-, which is the first of its kind.

CASA would not face the same barriers under the base scenario –Alternative 3-, as it has years of experience in the production of lime with the traditional technology located in a region with various producers using that technology.

<u>*List of alternatives not prevented by barriers:*</u>

Therefore, only alternative 3 corresponding to a capacity increase scenario using traditional technology would not be invalidated by barriers. Consequently, this alternative represents the baseline.

<u>***How the CDM help CASA to overcome the barriers presented?***</u>

Registering the project as CDM overcomes the barriers to the project activity corresponding to alternative 4. In this regard, the CDM project is possible on the basis of the following factors:

1. Access to the additives necessary for production.
2. Satisfactory research conducted by the departments of Electrical and Project Engineering of CASA to implement the new technology.
3. Affirmation of the sustainable nature of this project activity through the recognition of the prestigious framework provided by CDM, which may influence the public perception of the product.
4. Revenues from the sale of CERs, as they:

    a. Lower the technological barriers (necessary resources for R&D, training, technical tests, importation of additives).
    b. Reduce the risk of business failure associated with the fact of being the first of its kind.
    c. Act as a decisive incentive to build investors' trust and provide support for the implementation of the project.
    d. Allow mitigating the exchange rate risk associated with the purchase of an imported input which has no substitutes in the domestic market, in a competitive and essentially local buying market.

It can be concluded from the previous analysis, that the baseline matches Alternative 3. This is based on the fact that alternative 4 – an alternative to CDM project without being registered as such – could not be implemented given the mentioned barriers that it faces.

According to the "Combined tool to identify the baseline scenario and demonstrate additionality", *"if there is only one alternative scenario that is not prevented by any barrier, and if this alternative is not the proposed project activity undertaken without being registered as a CDM project activity, then this alternative scenario is identified as the baseline scenario. Explain – using qualitative or quantitative arguments – how the registration of the CDM project activity will reduce the barriers that prevent the propose project activity from occurring in the absence of the CDM. If the CDM reduces the identified barriers that prevent the proposed project activity from occurring, proceed to Step 4, otherwise the project is not additional"*.

Step 4 is not taken because the document entitled *"Indicative simplified baseline and monitoring methologies for selected small-scale CDM project activity categories*[19]*"* establishes in its paragraph 16 that "*for the purposes of this demonstration, participants may apply **Steps 1 to 3** of the latest version of the "Combined Tool to identify the baseline scenario and demonstrate additionality" to identify the baseline scenario"*.

Therefore, the analysis of additionality carried out allows concluding that:

a. To meet a high unsatisfied demand for lime in the Argentine construction market, the current installed productive capacity of the Olavarria plant is not sufficient. This CDM project makes it possible to increase productive capacity through a change in the production process using the same installed kiln capacity, without the need to increase the volumes of fossil fuel used in the calcination stage. This project could have not been implemented without the benefits of the CDM in view of the existence of technological and common practice-related barriers because it is the first of its kind.
b. The baseline scenario corresponds to Alternative 3: Capacity increase using the traditional technology.

In conclusion, the project is additional.

Prior consideration of the CDM for the Project Activity

The conclusion can be reached that the proposed project is additional and the project owner has been seriously considering the CDM application of the project to overcome the barriers. As is indicated in the timetable of key events in the development of the CASA project, due to the time needed to development a new methodology and new PDD, the time needed for DOE to evaluate the CDM project, the CDM development of the proposed project has been delayed. Still, the decision of the CDM application has been implemented by the project owner all along, though. Therefore, the CERs revenue is still essential for the project owner to go ahead with the implementation of the project activity.

Timeline of the proposed project activity:

[19] http://cdm.unfccc.int/Reference/Guidclarif/ssc/methSSC_guid06_v12.pdf

April 2005	PIN presented to DNA
February 2006	Request for product and process patent on Argentine office
October/November/December 2006	Quotations and proposals for consultancy services for CDM Cal Extra PWC and other suppliers
08/January 2007	Request for investment to Cementos Avellaneda Board of Directors to proceed with the development of the project under the CDM
12/March 2007	Issuance of Cementos Avellaneda'.Board of Directors (Shareholders) meeting minute which approved the investment for construction of alternative lime production plant
30/March 2007	Start of Works
May 2008	PDD presentation to DNA using meth AMS-II.D
May – August 2008	First validation using meth AMS-II.D
August 2008	Local stakeholders consultation
August 2008	Consultation addressed to the CDM-EB Small Scale Working Group (SSCWG) which indicated that the approved AMS-II.D small-scale methodology previously used was not applicable to the alternative lime project at the Olavarría plant
September 2008 – February 2009	Development of a new methodology entitled "Emission reduction in hydraulic lime production"
May 2009	The new methodology entitled AMS-III.AD "Emission reduction in hydraulic lime production" was approved in the 47 EB meeting for this project
April 2009	Second PDD using new meth AMS-III.A.D
April – December 2009	Second Validation using new meth AMS-III.A.D

B.6. Emission reductions:

B.6.1. Explanation of methodological choices:

Baseline emissions

Baseline emissions for each year "y" were determined using the equations 1, 2 and 3 of the AMS-III.A.D methodology, based on the calculations detailed in section B.6.2. The $BE_{ex-ante}$ baseline has been selected because it is the lowest, as established by equation 1.

The value of parameters ($Q_{AL,cap,y}$ and $Q_{AL,y}$) was determined following the procedures of the AMS-III.A.D methodology:

> *"The project activities involving increases in capacity purchased under a baseline scenario are eligible only if in compliance with the relative and relevant conditions of the General Guidance Document for small-scale methodologies requiring demonstrating that the baseline scenario for additional capacity is the same as the baseline scenario defined by this methodology".*

According to this procedure, it was determined that $Q_{AL, cap,y}$ is equal to $Q_{AL,y}$ ($Q_{AL,cap,y} = Q_{AL,y}$) to set the baseline the following condition laid down in the General Guidance was demonstrated in this PDD:

> *"If the baseline scenario identified for the additional (incremental) capacity is the same as in the methodology baseline, and it can be demonstrated that the implementation of the project as "the project activity proposed without being registered as CDM", is not the common practice in the region, participants in the project may apply the respective methodology".*

In section B.5 are detailed the procedures carried out for Steps 1 to 3 of the Combined additionality Tool to determine the baseline scenario and demonstrate additionality of this CDM project.

As $Q_{AL,cal,y} = Q_{AL,y}$ and $Q_{IHL,y} = Q_{HL}$ the values for $BE_{ex-ante}$ and $BE_{ex-post}$ are the same.

To estimate the emission reduction in this document $BE_{y\ ex-ante}$ has been used. During the project activity the baseline for each year "y" shall be recalculated following the procedures envisaged by the AMS-III.A.D methodology and selecting the lower of the two values for BE between the calculation ex – ante and el ex –post.

$$BE_y = Minimum\left(BE_{ex-ante,y}, BE_{ex-post,y}\right) \quad \textbf{(1)}$$

Where:

$BE_{ex-ante,y}$ = Baseline emissions based on *ex ante* specific emission factor per tonne of hydraulic lime produced (tCO_2)

$BE_{ex-post,y}$ = Baseline emissions calculated based on *ex post* specific emission factor per tonne of hydraulic lime produced as an intermediate product before blending (tCO_2)

$$BE_{ex-ante,y} = \frac{\sum_i EC_{FF,i,HL} * EF_{FF,CO2,i} + EC_{el,HL} * EF_{el,CO2}}{Q_{HL}} * Q_{AL,cap,y} \quad \textbf{(2)}$$

Where:

$EC_{FF,i,HL}$ = Historical annual average consumption of thermal energy using fossil fuel type *i* to produce baseline hydraulic lime (GWh_{th}/year). Historical annual consumption of each fuel type *i* (volumes, mass) during the three most recent years, multiplied by the respective net calorific value (NCV_i) are used for the determination of the average $EC_{FF,i,HL}$.

$EF_{FF,CO2,i}$ = CO_2 emission factor of the fossil fuel *i* (tCO_2/GWh_{th})

$EC_{el,HL}$ = Annual average consumption of electricity to produce hydraulic lime in the previous three years (GWh_{el}/year)

$EF_{el,CO2}$ = CO_2 emission factor for electricity consumption (tCO_2/GWh_{el})

Q_{HL} = Historical annual average production of baseline hydraulic lime in the three most years (tonne/year, dry basis)

$Q_{AL,cap,y}$ = Total production of alternative hydraulic lime of the project activity in the year *y* (tonne, dry basis)

<u>Project emissions</u>

Project emissions are related to the energy consumption (thermal and electric) for the production of the alternative hydraulic lime during the crediting period, including the production of the hydraulic lime as an intermediate product (before blending), but also the emissions for obtaining, processing, transporting and blending alternative/additive material.

$$PE_y = \frac{\sum_i EC_{FF,i,AL,y} * EF_{FF,CO2,i} + EC_{el,AL,y} * EF_{el,CO2}}{Q_{AL,y}} * Q_{AL,cap,y} \quad \textbf{(4)}$$

Where:

$EC_{FF,i,AL,y}$ = Thermal energy provided by the fossil fuel type *i* to produce alternative hydraulic lime in year *y* (GWh_{th})

$EC_{el,AL,y}$ = Electricity consumption in year *y* to produce alternative hydraulic lime (GWh_{el})

$Q_{AL,y}$ = Total production of alternative hydraulic lime in year *y* (tonne, dry basis)

Leakage emissions

The data used to calculate leakage emissions are confidential to CASA, due to the patent that CASA has comprising project lime production process. All information about the leakage emission due to the use of additive will be available for verification by the DOE and the EB.

This CDM-PDD shows the carbon emission factor, expressed as tCO_2/t alternative lime, for each one of the following emissions sources:

• Upstream emissions: emissions associated with energy consumption to produce the additive. (If this information is not public available, peer reviewed technical literatures may be used).

• Transportation emissions: emissions associated with fossil fuel used for the transportation of the additive from production site to project plant.

• Chemical oxidation emissions: if the additive used in the project is an organic substance, which is derived from fossil fuel, the CO_2 emissions associated with its oxidation shall be calculated, taking into account the carbon content and assuming that it is totally converted to CO_2 during use.

Souces	Value	Unit
Upstream emissions	4.64E-04	t CO_2/t alternative lime
Chemical oxidation emission	3.12E-03	t CO_2/t alternative lime
Transportation emissions	8.08E-05	t CO_2/t alternative lime

Emission reduction

The emission reduction of the CDM project is calculated by the following equation:

$$ER_y = BE_y - PE_y - LE_y \quad \mathbf{7)}$$

ER_y: Emission reduction in year y (tCO_2)
BEy = Baseline emissions (tCO2)
PE = Project emission (tCO2)
LEy = Leakage emissions (tCO2)

B.6.2. Data and parameters that are available at validation:

Data/Parameter:	$\mathbf{EF_{CO2,FF,i}}$
Data unit:	tCO_2/GWh
Description:	Default emission factor of petcoke
Source of data used:	2006 IPCC Guidelines for National Greenhouse Gas Inventories – Volume 2: Energy, Chapter 1: Introduction, Table 1.4[20]

[20] http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_1_Ch1_Introduction.pdf

Applied value:	351
Justification of the choice of data or description of measurement methods and procedures actually applied :	Default factor established by the IPCC (97 500 kg/TJ*3 600 s/1 000 000)
Any comment:	-

Data/Parameter:	**$EF_{CO2,el}$**
Data unit:	tCO_2/GWh
Description:	Emission factor of the Argentine electricity network, calculated as an ex–ante Combined Margin.
Source of data used:	Application of the Methodology ACM0002 Combined Margin (CM) with 0,50 Build Margin and 0,50 Operating Margin
Applied value:	430
Justification of the choice of data or description of measurement methods and procedures actually applied:	The Energy Secretariat has calculated the Emission Factor for Argentine electricity system for 2007 applying the tool to calculate the emission factor for an electricity system. This calculation is available at http://energia3.mecon.gov.ar
Any comment:	This information is publicly available.

Data/Parameter:	**Q_{HL}**
Data unit:	t Hydraulic lime/year
Description:	Historical annual average production of baseline hydraulic lime in the three most years (tonne/year, dry basis)
Source of data used:	Historical average production of hydraulic lime at the Lime Production Plant of Cementos Avellaneda S.A. Olavarría, for the years 2006, 2007 and 2008.
Applied value:	190 244
Justification of the choice of data or description of measurement methods and procedures actually applied :	CASA baseline data
Any comment:	-

Data/Parameter:	**$EC_{el,HL}$**
Data unit:	GWh/year
Description:	Annual average consumption of electricity to produce hydraulic lime in the previous three years (GWh_{el}/year)
Source of data used:	Historical annual weighted average consumption of electric energy used for the production of hydraulic lime for the years 2006, 2007 and 2008. Data obtained from measurements carried out at the Lime Production Plant of Cementos Avellaneda S.A. Olavarría.
Applied value:	8 49

Justification of the choice of data or description of measurement methods and procedures actually applied :	CASA baseline data.
Any comment:	-

Data/Parameter:	**$EC_{FF,i,HL}$**
Data unit:	GWh_{th}/year
Description:	Historical annual average consumption of thermal energy using fossil fuel type *i* to produce baseline hydraulic lime (GWh_{th}/year). Historical annual consumption of each fuel type *i* (volumes, mass) during the three most recent years, multiplied by the respective net calorific value (NCV_i) are used for the determination of the average.
Source of data used:	Historical annual weighted average consumption of thermal energy (from fossil fuel) used for the production of hydraulic lime for the years 2006, 2007 y 2008. Data obtained from measurements carried out at the Lime Production Plant of Cementos Avellaneda S.A. Olavarría.
Applied value:	165
Justification of the choice of data or description of measurement methods and procedures actually applied :	CASA baseline data.
Any comment:	-

Data / Parameter:	L.O.I
Unit:	%
Description:	IRAM 1504
Source of data used:	Application of the procedures installed at the Lime Plant of Cementos Avellaneda S.A.
Applied value:	Internal specification
Justification of the choice of data or description of measurement methods and procedures actually applied:	Normalized test for evaluating the addition of calcareous Filler
Comments:	If no specific guidance is included in the standard chosen then use sample sizes that provide results with a 90% confidence interval and a maximum 10% error margin.

Data / Parameter:	Water retention
Unit:	%
Description:	IRAM 1679
Source of data used:	Application of the procedures installed at the Lime Plant of Cementos

	Avellaneda S.A.
Applied value:	Internal specification
Justification of the choice of data or description of measurement methods and procedures actually applied:	Normalized test for evaluating the material's capacity as mortar to retain water
Comments:	If no specific guidance is included in the standard chosen then use sample sizes that provide results with a 90% confidence interval and a maximum 10% error margin

Data / Parameter:	Incorporated air
Unit:	%
Description:	IRAM 1634
Source of data used:	Application of the procedures installed at the Lime Plant of Cementos Avellaneda S.A.
Applied value:	Internal specification
Justification of the choice of data or description of measurement methods and procedures actually applied:	Normalized test for evaluating the material's capacity as mortar to incorporate air
Comments:	If no specific guidance is included in the standard chosen then use sample sizes that provide results with a 90% confidence interval and a maximum 10% error margin

Data / Parameter:	Hardening
Unit:	Minutes
Description:	IRAM 1619
Source of data used:	Application of the procedures installed at the Lime Plant of Cementos Avellaneda S.A.
Applied value:	Indicative
Justification of the choice of data or description of measurement methods and procedures actually applied:	Normalized test for evaluating the hydration of the material as mortar
Comments:	If no specific guidance is included in the standard chosen then use sample sizes that provide results with a 90% confidence interval and a maximum 10% error margin

Data/Parameter:	Quantity of fuel type i (pet coke)
Data unit:	Tones/year
Description:	Quantity of fuel type *i* consumed in three most recent years historical data (mass

	or volume units/year);
Source of data used:	Historical annual weighted average consumption of pet coke used for the production of hydraulic lime for the years 2006, 2007 y 2008. Data obtained from measurements carried out at the Lime Production Plant of Cementos Avellaneda S.A. Olavarría.
Applied value:	18 310
Justification of the choice of data or description of measurement methods and procedures actually applied :	CASA baseline data.
Any comment:	-

Data/Parameter:	**$EF_{CO2,FF,ii}$**
Data unit:	tCO_2/GWh_{th}
Description:	Default emission factor of gas oil
Source of data used:	2006 IPCC Guidelines for National Greenhouse Gas Inventories – Volume 2: Energy, Chapter 1: Introduction, Table 1.4[21]
Applied value:	267
Justification of the choice of data or description of measurement methods and procedures actually applied :	Default factor established by IPCC
Any comment:	-

Data/Parameter:	**NCV_{ii}**
Data unit:	TJ/mass or volume units
Description:	Net calorific value of the fuel type ii (Gas Oil)
Source of data used:	2006 IPCC Guidelines for National Greenhouse Gas Inventories – Volume 2: Energy, Chapter 1: Introduction.
Applied value:	3.56E-05
Justification of the choice of data or description of measurement methods and procedures actually applied :	-
Any comment:	-

Data/Parameter:	**NCV_i**
Data unit:	TJ/mass or volume units
Description:	Net calorific value of the fuel type i (coke)

[21] http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_1_Ch1_Introduction.pdf

Source of data used:	2006 IPCC Guidelines for National Greenhouse Gas Inventories – Volume 2: Energy, Chapter 1: Introduction.
Applied value:	0.0325
Justification of the choice of data or description of measurement methods and procedures actually applied :	-
Any comment:	-

Data/Parameter:	$\mathbf{EF}_{Upstream}$
Data unit:	tCO_2/t alternative lime
Description:	Emissions associated with energy consumption to produce the additive. (If this information is not public available, peer reviewed technical literatures may be used).
Source of data used:	"Energy Use and Energy Intensity of the U.S. Chemical Industry" – Energy Analysis Department - Environmental Energy Technologies Division Ernest Orlando Lawrence Berkeley National Laboratory - University of California Berkeley, California 94720
Applied value:	4.64E-04
Justification of the choice of data or description of measurement methods and procedures actually applied :	-
Any comment:	-

Data/Parameter:	$\mathbf{EF}_{Chemical\ oxidation}$
Data unit:	tCO_2/t alternative lime
Description:	Emissions associated with the oxidation of additive, taking into account the carbon content and assuming that it is totally converted to CO_2 during use.
Source of data used:	Stechiometric calculations
Applied value:	3.12E-03
Justification of the choice of data or description of measurement methods and procedures actually applied :	-
Any comment:	-

Data/Parameter:	$\mathbf{EF}_{Transportation}$
Data unit:	tCO_2/t alternative lime
Description:	Emissions associated with fossil fuel used for the transportation of the additive from production site to project plant. (Includes transportation by road and sea)
Source of data used:	Calculations made by Cementos Avellaneda and Software TeamTM Life Cycle

	Analysis
Applied value:	8.08E-05
Justification of the choice of data or description of measurement methods and procedures actually applied :	-
Any comment:	-

B.6.3 Ex-ante calculation of emission reductions:

Equation No 1:

$$BE_y = Minimum\left(BE_{ex-ante,y}, BE_{ex-post,y}\right)$$

Baseline	Description	Unit	Weigthed average
BEex-ante,y	Baseline emissions based on ex ante specific emission factor per tonne of hydraulic lime produced (tCO2)	tCO2/year	97 285
BEex-post,y	Baseline emissions calculated based on ex post specific emission factor per tonne of hydraulic lime produced as an intermediate product before blending (tCO2)	tCO2/year	97 285

Equation No 2:

$$BE_{ex-ante,y} = \frac{\sum_i EC_{FF,i,HL} * EF_{FF,CO2,i} + EC_{el,HL} * EF_{el,CO2}}{Q_{HL}} * Q_{AL,cap,y}$$

<table>
<tr><th>Baseline</th><th>Description</th><th>Unit</th><th>Weigth Average</th></tr>
<tr><td>$EC_{FF,i,HL}$</td><td>Historical annual average consumption of thermal energy using fossil fuel type i to produce baseline hydraulic lime (GWhth/year). Historical annual consumption of each fuel type i (volumes, mass) during the three most recent years, multiplied by the respective net calorific value (NCVi) are used for the determination of the average ECFF,i,HL.</td><td>$GWh_{TH/year}$</td><td>165</td></tr>
<tr><td>$EF_{FF,CO2,i}$</td><td>CO2 emission factor of the fossil fuel i (pet coke) (tCO_2/GWhth)</td><td>tCO2/GWh</td><td>351</td></tr>
<tr><td>$EFel,_{CO2}$</td><td>CO2 emission factor for electricity consumption (tCO_2/GWhel)</td><td>tCO2/GWh</td><td>430</td></tr>
<tr><td>$ECel_{,HL}$</td><td>Annual average consumption of electricity to produce hydraulic lime in the previous three years (GWhel/year)</td><td>GWhel/year</td><td>8</td></tr>
<tr><td>Q_{HL}</td><td>Historical annual average production of baseline hydraulic lime in the three most years (tonne/year, dry basis)</td><td>tonne/year</td><td>190 244</td></tr>
<tr><td>$Q_{AL,y}$</td><td>Total production of alternative hydraulic lime of the project activity in the year y (tonne, dry basis)</td><td>tonne</td><td>
<table>
<tr><th>Year</th><th>Production (Estimations)</th></tr>
<tr><td>2010</td><td>300 000</td></tr>
<tr><td>2011</td><td>309 000</td></tr>
<tr><td>2012</td><td>318 270</td></tr>
<tr><td>2013</td><td>327 818</td></tr>
<tr><td>2014</td><td>337 653</td></tr>
<tr><td>2015</td><td>347 782</td></tr>
<tr><td>2016</td><td>358 216</td></tr>
<tr><td>2017</td><td>368 962</td></tr>
<tr><td>2018</td><td>380 031</td></tr>
<tr><td>2019</td><td>390 035</td></tr>
</table>
</td></tr>
</table>

Equation No 4:

$$PE_y = \frac{\sum_i EC_{FF,i,AL,y} * EF_{FF,CO2,i} + EC_{el,AL,y} * EF_{el,CO2}}{Q_{AL,y}} * Q_{AL,cap,y}$$

Parameter	Description	Unit	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
PEy	Project activity emissions in the year y (tCO2)	tCO2/year	64 633	64 846	65 065	65 291	65 524	65 763	66 010	66 265	66 526	66 763
ECFF,i,AL,y	Thermal energy provided by the fossil fuel type i to produce alternative hydraulic lime in year y (GWhth)	GWhTH,i	165	165	165	165	165	165	165	165	165	165
EFFF,CO2,i	CO2 emission factor of the fossil fuel i (pet coke) (tCO2/GWhth)	tCO2/GWh	351	351	351	351	351	351	351	351	351	351
ECFF,ii,AL,y	Thermal energy provided by the fossil fuel type ii to produce alternative hydraulic lime in year y (GWhth)	GWhTH,ii	0.13	0.14	0.15	0.16	0.17	0.19	0.20	0.21	0.22	0.24
EFFF,CO2,ii	CO2 emission factor of the fossil fuel i (gas oil) (tCO2/GWhth)	tCO2/GWh	267	267	267	267	267	267	267	267	267	267
ECel,AL,y	Electricity consumption in year y to produce alternative hydraulic lime (GWhel)	GWhel	15	16	16	17	17	18	18	19	20	20
EFCO2,ELE	Grid emission factor (tCO2/GWh)	tCO2/GWh	430	430	430	430	430	430	430	430	430	430
QAL,y	Total production of alternative hydraulic lime in year y (tonne, dry basis)	tonnes/year	300 000	309 000	318 270	327 818	337 653	347 782	358 216	368 962	380 031	390 035

Parameter	Description	Unit	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
QAL,cap,y = QAL,y	"Total production of alternative hydraulic lime of the project activity in the year y (tonne, dry basis)	tonnes/year	300 000	309 000	318 270	327 818	337 653	347 782	358 216	368 962	380 031	390 035

Equation No 5:

$$ER_y = BE_y - PE_y - LE_y$$

CDM Project	Description	Unit	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
PE_y	Project Emission in year "y"	tCO_2e/year	64 633	64 846	65 065	65 291	65 524	65 763	66 010	66 265	66 526	66 763
BE_y	Baseline emission in year "y"	tCO_2e/year	97 285	100 204	103 210	106 306	109 495	112 780	116 164	119 649	123 238	126 482
ER_y	Emission Reduction in year "y"	tCO_2e/year	31 554	34 227	36 979	39 815	42 735	45 743	48 841	52 033	55 320	58 290
LEy	Leakage Emissions in year "y"	tCO2e/year	1 099	1 132	1 166	1 201	1 237	1 274	1 312	1 351	1 392	1 428

B.6.4 Summary of the ex-ante estimation of emission reductions:

Year	Estimation of project activity emissions (tCO_2/year)	Estimation of baseline emissions (tCO_2/year)	Estimation of leakage (tCO_2/ year)	Estimation of overall emission reductions (tCO_2/ year)
2010	97 285	64 633	1 099	31 554
2011	100 204	64 846	1 132	34 227
2012	103 210	65 065	1 166	36 979
2013	106 306	65 291	1 201	39 815
2014	109 495	65 524	1 237	42 735
2015	112 780	65 763	1 274	45 743
2016	116 164	66 010	1 312	48 841
2017	119 649	66 265	1 351	52 033
2018	123 238	66 526	1 392	55 320
2019	126 482	66 763	1 428	58 290
Total (tonnes of CO_2 e)	**1 114 813**	**656 685**	**12 591**	**445 537**

B.7 Application of a monitoring methodology and description of the monitoring plan:

Equipment used for monitoring purposes are calibrated through equipment calibration and verification procedures (Procedures shared between ISO 9000 and 14001) adopted at the Olavarría CASA Plant, known as Measurement and Testing Equipment Controls. These procedures establish equipment verification routines and lists of critical equipment.

Equipment calibrations are certified since they are made by an independent third party (such as the National Institute of Industrial Technology –INTI-, the Argentine Institute Standards –IRAM-, etc.), and they ensure data accuracy.

Data is managed through the Testing Registry System (SRE) and the SAP system. Both databases are currently in force; however, data are being migrated from the first to the second system.

Measurement methods and Quality Control and Quality Assurance procedures (QA/QC) are managed through ISO 9000 and ISO 14001 system procedures at the Olavarría CASA Plant.

Each parameter is monitored following a procedure established by CASA, and data are obtained through the Testing Registry System (SRE) and the SAP system.

There are procedures within the framework of the ISO 9000 and ISO 14001 systems which establish the responsibilities of the persons who perform the monitoring activities. These parameters are aligned with those indicated in the PDD. Based on a responsibility chart prepared by each plant, the procedures establish the persons responsible for measuring each parameter.

B.7.1 Data and parameters monitored:

Data / Parameter:	**Q_{ALy}**
Data Unit:	t/year
Description:	Is the annual average production of alternative lime in year "y"
Source of data used:	Production of alternative lime at the Lime Production Plant of Cementos Avellaneda S.A. Olavarría, in year "y".
Value	Total production of alternative lime in year *y* (t, dry basis). This shall be direct measured and recorded by weighing the final product.
Description of measurement methods and procedures to be applied:	Representative samples are taken, to measure the moisture content of the final product, and calculate the produced quantity in dry basis. Application of procedures installed at the Lime Plant of Cementos Avellaneda S.A.
QA/QC procedures to be applied:	Procedures pursuant to ISO 14001 and ISO 9001.
Any comment:	-

Data / Parameter:	**Q_{IHLy}**
Data Unit:	t/year
Description:	Total production of hydraulic lime as intermediate product (before blending) in year *y* (t, dry basis).
Source of data used:	This shall be directly measured and recorded by weighing the intermediate product. Production of alternative lime at the Lime Production Plant of Cementos Avellaneda S.A. Olavarría, in year "y".
Value	-
Description of measurement methods and procedures to be applied:	Representative samples are taken, to measure the moisture content, and calculate the produced quantity in dry basis. Application of procedures installed at the Lime Plant of Cementos Avellaneda S.A.
QA/QC procedures to be applied:	Procedures pursuant to ISO 14001 and ISO 9000.
Any comment:	-

Data / Parameter:	Compressive strength 7-28 days
Data Unit:	Mpa
Description:	IRAM 1695
Source of information to be used:	Application of procedures installed at the Lime Plant of Cementos Avellaneda S.A.
Value	Indicative
Description of the measurement methods and procedures to be applied:	Normalized test describing the behavior of the material as mortar in the event of compressive strength.
QA/QC procedures to be applied:	If no specific guidance is included in the standard chosen then use sample sizes that provide results with a 90% confidence interval and a maximum 10% error

	margin.
Comments:	

Data / Parameter:	Autoclave expansion
Data Unit:	%
Description:	IRAM 1695
Source of information to be used:	Application of the procedures installed at the Lime Plant of Cementos Avellaneda S.A.
Value	Internal specification
Description of the measurement methods and procedures to be applied:	Normalized test for evaluating the constant volume of the material as mortar
QA/QC procedures to be applied:	If no specific guidance is included in the standard chosen then use sample sizes that provide results with a 90% confidence interval and a maximum 10% error margin.
Comments:	

Data / Parameter:	Residue over #200 mesh screen
Data Unit:	%
Description:	IRAM 1695
Source of information to be used:	Application of the procedures installed at the Lime Plant of Cementos Avellaneda S.A.
Value	IRAM 1508
Description of the measurement methods and procedures to be applied:	Normalized test for controlling the thinness of the material
QA/QC procedures to be applied:	If no specific guidance is included in the standard chosen then use sample sizes that provide results with a 90% confidence interval and a maximum 10% error margin.
Comments:	

Data / Parameter:	$EC_{el,IHL,y}$
Data Unit:	GWh/year
Description:	Consumption of electric energy used for the production of Hydraulic lime before blending in year *y*
Source of information to be used:	Measurements performed at the Lime Production Plant of Cementos Avellaneda S.A. Olavarría for year “y”.
Value	Electricity consumption shall be monitored in each piece of equipment associated with producing of intermediate product (hydraulic lime before blending).
Description of the measurement methods	Application of procedures installed at the Lime Plant of Cementos Avellaneda S.A.

and procedures to be applied:	
QA/QC procedures to be applied:	Procedures pursuant to ISO 14001 and ISO 9000.
Comments:	-

Data / Parameter:	$EC_{FF,i,IHL,y}$
Data Unit:	GWh_{th}/year
Description:	Thermal energy (from fossil fuel) used for the production of hydraulic lime before blending in year *y* (GWh_{th});
Source of information to be used:	Measurements performed at the Lime Production Plant of Cementos Avellaneda S.A. Olavarría for year "y".
Value	Fuel consumption shall be monitored in each equipment associated with producing of intermediate product (hydraulic lime before blending).
Description of the measurement methods and procedures to be applied:	Application of procedures installed at the Lime Plant of Cementos Avellaneda S.A.
QA/QC procedures to be applied:	Procedures pursuant to ISO 14001 and ISO 9000.
Comments:	-

Data / Parameter:	$EC_{el,AL,y}$
Data Unit:	GWh_{el}/year
Description:	Consumption of electric energy used for the production of alternative hydraulic lime in year *y.*
Source of information to be used:	Measurements performed at the Lime Production Plant of Cementos Avellaneda S.A. Olavarría for year "y".
Value	This value encompasses the electric energy for the production of hydraulic lime before blending ($EC_{el,i,IHL,y}$) plus the electricity used for obtaining, processing, transporting and blending alternative material.
Description of the measurement methods and procedures to be applied:	Application of procedures installed at the Lime Plant of Cementos Avellaneda S.A. Electricity consumption shall be monitored in each equipment associated with producing of final product (alternative hydraulic lime).
QA/QC procedures to be applied:	Procedures pursuant to ISO 14001 and ISO 9000.
Comments:	-

Data / Parameter:	$EC_{ff,i,AL,y}$
Data Unit:	GWh_{th}/year
Description:	Thermal energy (from fossil fuel type *i*) used for the production of alternative hydraulic lime in year *y*

Source of information to be used:	Measurements performed at the Lime Production Plant of Cementos Avellaneda S.A. Olavarría for year "y".
Value	This value encompasses the thermal energy for the production of hydraulic lime before blending ($EC_{ff,i,IHL,y}$), plus the fossil fuel used for obtaining, processing, transporting and blending alternative material.
Description of the measurement methods and procedures to be applied:	Application of procedures installed at the Lime Plant of Cementos Avellaneda S.A. Thermal consumption shall be monitored in each equipment associated with producing of final product (alternative hydraulic lime)
QA/QC procedures to be applied:	Procedures pursuant to ISO 14001 and ISO 9000.
Comments:	-

Data / Parameter:	**Alternative material**
Data unit:	Tonnes/year
Description:	Annual consumption of alternative material in year y
Source of data to be used:	Alternative material consumption in year y (t alternative material).
Value of data	Measured and recorded by direct weighing.
Description of measurement methods and procedures to be applied:	-
QA/QC procedures to be applied:	-
Any comment:	-

Data / Parameter:	**Additive, y**
Data unit:	Tonnes
Description:	Additive consumption in year y (t additive).
Source of data to be used:	Measurements performed at the Lime Production Plant of Cementos Avellaneda S.A.
Value of data	Measured and recorded by direct weighing
Description of measurement methods and procedures to be applied:	**-**
QA/QC procedures to be applied:	**-**
Any comment:	**-**

B.7.2 Description of the monitoring plan:

The Department of Electric Engineering (DEE) of Cementos Avellaneda S.A. has developed a set of technologies which allows continuous monitoring of a large number of specific parameters, including those that must be monitored under the current CDM Project.

The control logic, the remote control and the automation of the dosage systems for the components of the mix have been totally developed and implemented at PLC (Programmable Logic Controller) and HMI (Human-Machine Interface), standard control elements and industrial automation.

This system has been totally developed by CASA, since there is no control product or proper know-how for this application on the market. The kinds of measurements to be done are common practice for Cementos Avellaneda´s production and maintenance personnel.

As indicated in section B.7.1 thermal and electrical energy consumption will be monitored in the following equipments:

- Lime kiln and its peripherals:
    - feeding system
    - discharge system
    - forced air fans
    - Transport systems (bucket elevators, chain conveyors)
- Lime grinding plant:
    - hydraulic press
    - dynamic separator
    - transport systems (screw conveyors)
- Lime hydration plant:
    - Lime slakers
    - Transport systems (bucket elevators and screw conveyors)
- Alternative material grinding plant:
    - Vertical roller mill
    - Separator
    - Transport systems (bucket elevators and air-slide conveyors)
- Alternative hydraulic lime blending process:
    - feeding systems
    - Mixer
    - Transport system (screw conveyors and bucket elevator)

The following list is the measuring equipment:

- Online ammeters, voltmeters and/or wattmeters.
- Online scales with load cells for instant petcoke, limestone and additive consumption.
- Truck scale for total petcoke consumption.

Cementos Avellaneda SA has an Inspection and Trial Plan to monitor the equality and / or improvement of the performance properties defined to correlate Alternative Lime and Baseline lime. This plan is developed by CASA's laboratory and this unit is responsible of the registration of the results of the trials to be performed. The information is registered in SAP system and with the historic information the product performance and the comparative evolution can be monitored.

According to Cementos Avellaneda S.A. patent, it is possible to incorporate some kinds of alternative materials (non calcined materials, besides limestone) in product formulation, according to paragraph 3 (c) of III.A.D methodology. The eventual use of such materials should be declared on monitoring reports and would be considered in emission reduction calculations.

B.8 Date of completion of the application of the baseline and monitoring methodology and the name of the responsible person(s)/entity(ies)

The baseline and new methodology AMS-III.AD "Emission reductions in hydraulic lime production**"** was prepared by:
PricewaterhouseCoopers
Tel: +54 11 4850 6816
Fax: + 54 11 4850 6100
Contact: Marcelo Iezzi, marcelo.iezzi@ar.pwc.com

Date on which the application of the baseline and monitoring methodology was completed:
18/05/2009

SECTION C. Duration of the project activity / crediting period

C.1 Duration of the project activity:

C.1.1. Starting date of the project activity:

12/03/2007 (Shareholders´s minutes which approved the investment for construction of alternative lime production plant)

C.1.2. Expected operational lifetime of the project activity:

More than 20 years

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

C.2.1. Renewable crediting period:

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:

C.2.2.1. Starting date:

1st March 2010.

C.2.2.2. Length:

10 years

SECTION D. Environmental impacts

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

Cementos Avellaneda S.A. understands that the environmental protection it carries out in its activities is a key factor in the definition of its business policies and strategies.

For this purpose, the Company has defined an Environmental Management System, which uses ISO standard 14001 as a reference, establishing objectives and aims to be met, based on written and auditing procedures that ensure its efficacy.

The environmental policy encompasses the Company's own personnel, customers, suppliers and contractors in order to prevent contamination, as well as to encourage compliance with the current laws, the sustainable development, the optimization of consumption of non-renewable natural resources and continued renewal of environmental practices.

CASA has a Manual of Environmental Management System (EMS), in which it summarizes the implemented management system and is related to the main activities of the Company, as well as to customers, suppliers and contractors[22].

This project is developed within the framework of such EMS, and in this context, CASA has carried out an identification analysis of negative environmental aspects/impacts that could occur as a result of the implementation of the CDM project. In this analysis, it can be seen that the project does not cause significant negative environmental impacts, but, to the contrary, reduces the emissions of the combustion gases and reduces the consumption of non-renewable energy sources.

Pursuant to Argentine legislation and requirements, no new Environmental Impact Assessment should be carried out at the time of renewing the Environmental Certificate. The procedure is as follows:

As established by Decree 1741/96 of the Province of Buenos Aires – Chapter V of Amendments and Extensions, a new Environmental Impact Assessment should be made in the case of projects which are amended or extended as established by Section 57.

Section 57:

- Establishments holding an Environmental Certificate which considered the possibility of introducing changes to its processes, buildings or facilities by means of:

a) An increase of more than 20% of installed capacity

b) An increase of more than 20% of the production area

[22] http://www.cementosavellaneda.com.ar/gestion_ambiental.htm

c) Changes to the conditions of the working environment

d) A significant increase in gas emission levels, production of solid and/or semisolid waste or significant variation in their type.

e) Changes or extensions to the item in general.

Current situation of CASA

Following the guidelines set forth in Section 57 it was determined that no new Environmental Impact Assessment is required to carry out the necessary procedures for renewing the Environmental Certificate due to the following:

- Expansion of capacity: Lower than 20%. Installed capacity before the project was 35362 HP and after the project amounted to 39362 HP; therefore there was a 4000 HP expansion.
- Increase in the production area: An area ratio of 0.0479 (year 2006).
- There are no significant changes to the working conditions.
- There is no significant increase in gas emission levels, production of solid and/or semisolid waste or significant variation in their type. In fact, these issues are expected to improve as explained in the PDD.
- There are no changes or extensions to the item in general.

In view of the above, no new Environmental Impact Assessment should be made at the date of renewing the Environmental Certificate.

D.2.If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to support documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party:

No negative impacts have been identified due to the implementation of this project.

SECTION E. Stakeholders' comments

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

On August 20, 2008 the alternative lime production project within the framework of the CDM was presented at Salón Azul in the City Council of Olavarría, Buenos Aires.

In reply to an invitation through different media, such as electronic mails, letters delivered in person, announcements in the radio and local newspapers, approximately 50 people were in attendance at this event.

Among the people in attendance at the special event for the presentation of the CDM project were:

- The Designated National Authority (AND), Argentine Office for the Clean Development Mechanism (OAMDL) of the Secretariat for the Environment and Sustainable Development.
- Local entities, such as Civil Defense Office, Universidad del Centro de la Provincia de Buenos Aires, the President of the City Council, and the Municipality of Olavarría, with the presence on the panel of the Director of the Environment and Sustainable Development of that Municipality
- Representatives of competing companies, such as Loma Negra and Guerrico S.A.
- Neighbours and employees of Cementos Avellaneda S.A.

The presentation of the project lasted approximately 40 minutes, with the projection of information about climate change and greenhouse effect; the Kyoto Protocol and the Clean Development Mechanism; technical details about the CDM project on the production of alternative lime at the Olavarría Plant of Cementos Avellaneda; the Company's environmental performance and sustainability. It was led by CEmentos Avellaneda's Environmental and Plant Managers.

At the end of the presentation, the question-and-answer session was opened. (The entire digital projection about the event, a list of the people in attendance and consultations received are available). Finally, the Company thanked the audience for their participation in the event and again communicated the e-mail address of Cementos Avellaneda S.A., telephone numbers to address consultations, as well as the website for future questions and communications.

The method for the documentation and registration of the Company's internal and external communications is detailed in one of the procedures of the EMS, which is aimed at dealing with the communications relating to environmental issues.

Each incoming and outgoing communication in the Organization is handled by the designated persons; the EMS defines a flowchart establishing the persons responsible for each type of communication.

Within this framework, the consultations addressed by the stakeholders in this CDM project are included in the EMS and the procedures established by this system are followed. Consultations have included the incoming and outgoing communications.

In addition to the presentation of the CDM project in Olavarría on August 20, 2008, CASA has presented this project at other events, within the framework of the application of a methodology for identifying stakeholders, based on the analysis of each link in the value chain of the alternative lime production process under the CDM project.

This tool helped identify the stakeholders in each link in the chain, which permitted formulating an approximation strategy for each group, according to their relationship or involvement in the project. Some of the events held are listed below:

- Seminar on Carbon Markets – Rosario Stock Exchange – November 2007
- 2007 Environmental Forum Symposium – August 31, 2007
- First Symposium of the Territorial and Environmental Vision Strategic Plan – San Luis
- I International Seminar on Climate Change – Spanish Chamber of Commerce in Argentina – Years 2006 and 2007
- Presentation of the CDM project before the Management of CASA – May 2007
- Carbon Markets Americas, Sao Paulo, Brasil, April 2009

E.2. Summary of the comments received:

Some of the comments received during the presentation of the project at the Salón Azul in the City Council of Olavarría, Buenos Aires, on August 20, 2008 are the following:

- **Representative of Civil Defense**

Question: Please, specify the use of alternative fuels.

Answer: No alternative fuels are used in the production of alternative lime. At present, only the traditional fossil fuels are used in the production process.
The alternative materials and additives are compatible materials, known in the cement and lime industries.

- **Representative of the School of Engineering**

Question: Is this presentation a part of the requirements imposed by the CDM?

Answer: Yes, this presentation is required by the Secretariat for the Environment within the Public Consultation Mechanism, although the project has been communicated in other areas. Under other CDM projects of CASA we have carried out this consultation through other media, but in this case the Secretariat has requested us to fulfill this requirement through a public consultation.

Question: How is the project additionality demonstrated, despite its later phase?

Answer: All the phases of the project have been strictly fulfilled. The project was developed under the CDM from the very beginning. It is the first of its kind.

- **Representative of Fundación Nuevo Horizonte**

Question: Could you please explain the relationship between the reduction of local emissions and the emissions in the core countries and transfer of technology.

Answer: Transfer of technology from the core countries has not strictly occurred in this case as technology has been developed locally.

- **President of Universidad Nacional de Centro – School of Engineering:**

Question: Has the product been tested for durability, to approach sustainability?

Answer: Durability and wear tests were carried out and they proved satisfactory. The durability of the lime and extra lime products should be the same.

Question: Are environmental contaminants used?

Answer: Absolutely natural products are used, except for fuels.

- **Representative of a lime company:**

Question about Energy Efficiency:

Answer: The project is already highly efficient. The baseline is mobile; according to the market, we are going to have the same production level and to increase gross production. One can expand the process in a traditional or alternative manner, much more CO_2 would be produced in the first case. A lower quantity of fuel is consumed per unit of finished product. Emissions are reduced. With the same sales volume, the kiln is less used, so emissions are reduced.

If the product is replaced with the new one, emissions of CO_2 are reduced. If another producer had to supply that market with the traditional technology, more CO_2 emissions would be produced.

- **Representative of the Municipality:**

Question: How will the product be replaced?

Answer: It is expected that the product will be gradually replaced in the market. This will be determined by users. Extra lime is expected to replace the traditional product in the future.

- **Representatives of Loma Negra**

Question: Which is the cost of the new product?

Answer: The detail cost is not available. In principle, there is no net cost benefit from manufacturing either product. The cost of using additives should be considered. This is one of the barriers included in the PDD.

- **Representative of Universidad del Centro**

Question: Is this a single product or a range of products?

Answer: In principle, this is a single product with an approved determined formula, although subject to change.

- **Representative of Universidad del Centro**

Question: Have the emissions produced by the transportation and manufacture of additives been taken into account under this small-scale project?

Answer: According to Engineer Gutiérrez, these emissions were taken into account in the PDD, but they would not be significant. In fact, the emissions derived from the manufacture of additives are being considered.

Other comments have been received from the stakeholders in attendance at other events in addition to the consultations addressed during the presentation of the project by e-mail, as well as during the presentations and some answers to the questionnaires presented.

E-mails were received from the Facultad de Ciencias Agrarias (School of Agrarian Sciences) of the National University of Rosario, transmitting congratulations for the presentation made by CASA during the Seminar on Carbon Markets – Rosario Stock Exchange, to which copies of the presentation made by CASA during the seminar were sent.

At the end of the presentations of the 2007 Environmental Forum, those present were given a questionnaire to evaluate the quality of the Forum and of each presentation in particular. The presentation made by Cementos Avellaneda S.A. was qualified with a 4, on a scale of 1 to 5, with 5 as excellent and 1 inadequate.

All the comments received were recorded in the Environmental Management System as part of the communications process of CDM projects.

No comments that are adverse to the Project have been received.

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

In each of the presentations of this project (described in Section E.1) the consultation procedure was channeled through on-site questions during the presentation at each of the seminars and/or sessions, as well as by means of an e-mail box at which consultations were received and the corresponding replies were supplied.

All the internal and external communications have been included in the MEM, as well as the consultations/comments received after the presentation and their respective replies.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Organization:	Cementos Avellaneda S.A
Street/P.O.Box:	Defensa 113, 6°
Building:	
City:	Buenos Aires
State/Region:	
Postfix/ZIP:	C1065AAA
Country:	Argentina
Telephone:	005411-4331-7081
FAX:	005411-4331-1664
E-Mail:	fg@cavellaneda.com.ar
URL:	www.cavellaneda.com.ar
Represented by:	
Title:	Strategic Resources Manager
Salutation:	
Last Name:	Gutiérrez
Middle Name:	Federico
First Name:	
Department:	
Mobile:	
Direct FAX:	
Direct tel:	+54 9 11 41630598
Personal E-Mail:	fg@cavellaneda.com.ar

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

There is no public funding involved in this project.

Annex 3

BASELINE INFORMATION

Step 1: Quicklime (CaO)	**2006**	**2007**	**2008**	**Simple Average**	**Weigthed average**
Quicklime production (tonnes)	176 998	175 144	149 663	167 268	-
Energy (kwh)	5 208 428	4 490 250	3 751 232	4 483 303	4 523 156
Thermal energy (pet coke) (tonnes)	19 235	18 990	16 421	18 215	18 310
Energy provided by pet coke (TJ)	610	602	534	592	595
Limestone (tonnes)	268 178	265 369	226 758	253 435	254 844

Step 2: Ground quicklime (CaO)	**2006**	**2007**	**2008**	**Simple Average**	**Weigthed average**
Ground quicklime production (tonnes)	177 118	175 214	149 219	167 184	-
Energy (electricity) (kWh)	3 184 675	3 131 838	2 639 925	2 985 479	3 004 145

Step 3: Hydraulic lime (Ca(OH)2)	**2006**	**2007**	**2008**	**Simple Average**	**Weigthed average**
Hydraulic lime production (tonnes)	201 422	200 548	168 762	190 244	-
Energy (electricity) (kwh)	1 027 880	1 018 758	811 930	952 856	960 820

Total energy consumption in Baseline Scenario	**2006**	**2007**	**2008**	**Simple Average**	**Weigthed average**
Annual average consumption of electricity to produce hydraulic lime in the previous 3 years. GWhe/year	9.42	8.64	7.20	8.42	8.49
Annual average consumption of thermal energy to produce hydraulic lime in the previous 3 years(GWhth/year)	174	171	148	164,45	165,36