



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

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**Revision history of this document**

<b>Version Number</b>	<b>Date</b>	<b>Description and reason of revision</b>
01	21 January 2003	Initial adoption
02	8 July 2005	<ul style="list-style-type: none"><li>• The Board agreed to revise the CDM SSC PDD to reflect guidance and clarifications provided by the Board since version 01 of this document.</li><li>• As a consequence, the guidelines for completing CDM SSC PDD have been revised accordingly to version 2. The latest version can be found at <a href="http://cdm.unfccc.int/Reference/Documents">http://cdm.unfccc.int/Reference/Documents</a>.</li></ul>

**SECTION A. General description of the small-scale project activity****A.1. Title of the small-scale project activity:**

RIMA Fuel Switch in Bocaiúva  
CDM Small Scale Project  
Date: August 18, 2006  
Version: 02

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

The project activity consists of switching from fossil fuel oil to renewable biomass at Rima Industrial's plant located in Bocaiúva, Minas Gerais, Brazil. This plant produces metallic magnesium and alloys, both as lingots and powder, and auto parts, the main consumers of which are the steel, aluminium and automobile sectors. The first step of the process is calcining dolomite ( $\text{CaCO}_3 + \text{MgCO}_3$ ) in order to transform it into magnesium oxide (MgO) and calcium oxide (CaO) with a Loss on Ignition lower than 0.30%.

Since early 2004, Rima has been studying CDM project opportunities, participating in seminars and congresses, both in Brazil and abroad and discussing possibilities with project developers. In February 2005, the board of directors approved this fuel switch project, where the key driver was CER revenues. Operations started on 1 April 2006.

Besides the Bocaiúva plant, Rima operates two plants in the region that produce mainly ferroalloys and metallic silicon. All three plants have reduction furnaces that use charcoal as reducing agent. More than three quarters of the charcoal consumed in these plants is produced in Rima's sustainable managed forests.

Rima has five eucalyptus and pinus plantations within 250 km covering 40,000 ha where charcoal is produced in pyrolysis ovens. These ovens were designed by Rima's technical staff and are continuously improved in order to enhance efficiency. At each industrial plant, charcoal passes through sieves in order to separate the fines from material with the proper size for the production of metallic silicon and ferroalloys.

The fuel switch project will use the fines, left over from sieving, to displace fuel oil used in the calcination kiln. Before this project activity, fines were partially sold to cement, ceramic and brick companies in the region.

The project is located in the industrial district of Bocaiúva, in the northern part of the State of Minas Gerais, a region dedicated to metallurgy, mining, agriculture and forestry.

Rima Industrial S/A employs more than 3.000 workers; 500 are involved with forest management and charcoal production and manipulation. The plant at Bocaiúva has 35 workers allocated to the dolomite kiln and raw material storage. The company is responsible for the training, maintenance and service on the kiln technology, which improves the local manpower skills and provides an opening for employment or recruitment of skilled staff.



All changes in the burner system allowing for charcoal fines to be used as a fuel were carried out by Rima's technical staff, involving a team of 20, consisting of engineers, project developers and workers and took more than 200 work-days for completion of the first phase. The second phase is due November 2006 and comprises a drying charcoal fines using hot air from the kiln, modifications in mills and sieves and kiln instrumentation and control.

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

- Contributes to local environmental sustainability since it will decrease the use of fuel oil;
- Creates social benefits related to improvement of labour conditions;
- Increases local job opportunities as the project requires additional manpower;
- Increases work opportunities in the region by stimulating sustainable management of existing forests;
- Contributes to technology and capacity development as new kiln burners and process control specifications must be put in place for the new fuel.

#### **A.3. Project participants:**

<b>Name of Party involved (*) (host) indicates a host Party)</b>	<b>Private and/or public entity(ies) project participants (*) (as applicable)</b>	<b>Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No)</b>
Brazil - host	Private entity – Rima Industrial S/A	NO

Detailed contact information on parties and private/public entities involved in the project activity is listed in Annex 1.

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

Rima's dolomite kiln was built in 1958 and has gone through minor changes since. Main characteristics are shown in the table below:

Type	Rotary Kiln
Manufacturer	F.L.Smith
Year of construction	1958
Fuel (original)	Heavy Fuel Oil (Brazilian BPF)
Burning capacity	27 t/day of oil BPF
Power capacity	60 kW
Production capacity	180 t/day

**Table 1 –Dolomite Kiln**

The project activity involves installing a new burner system in order to be able to burn charcoal fines. The old oil burner system has been deactivated but remains in place. The development of the new burner was carried out by Rima's technical staff. The project also includes storage facilities, feeding system for the fines and the hot gas recycling to dry the charcoal fines at the mill.

All QC/QA procedures concerning charcoal and charcoal fines are the same already being carried out for use in the rest of the plants. In-plant laboratory analysis determines if the material is within the specified ranges regarding impurity content and, humidity . These analyses are carried out on a daily basis in the plant laboratory. Heating value (lower) of the charcoal was determined in a third-party laboratory on a weekly basis during 2005.

The temperature profile in the kiln is the main operating parameter and is set according to the quantity and quality (Mg content) of raw material (dolomite) being fed. The temperature profile is basically determined by fuel flow, which is controlled by a load cell located right before the burner.



Figure 1 – Photograph of the plant, showing the dolomite kiln in the foreground and the piles of charcoal in the background

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

**A.4.1.1. Host Party(ies):**

Brazil.

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

State of Minas Gerais.

#### A.4.1.3. City/Town/Community etc:

Bocaiúva.

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

The project is located in Central Brazil, state of Minas Gerais, in the Industrial District of the city of Bocaiúva (latitude 17° 36' 07" South and longitude 43° 48' 28" West).

Bocaiúva is located 60 km south of Montes Claros, the major town in the region, and 370 km north of Belo Horizonte, the state capital.

The maps below locate the project in Brazil, Minas Gerais and in the northern part of the state:

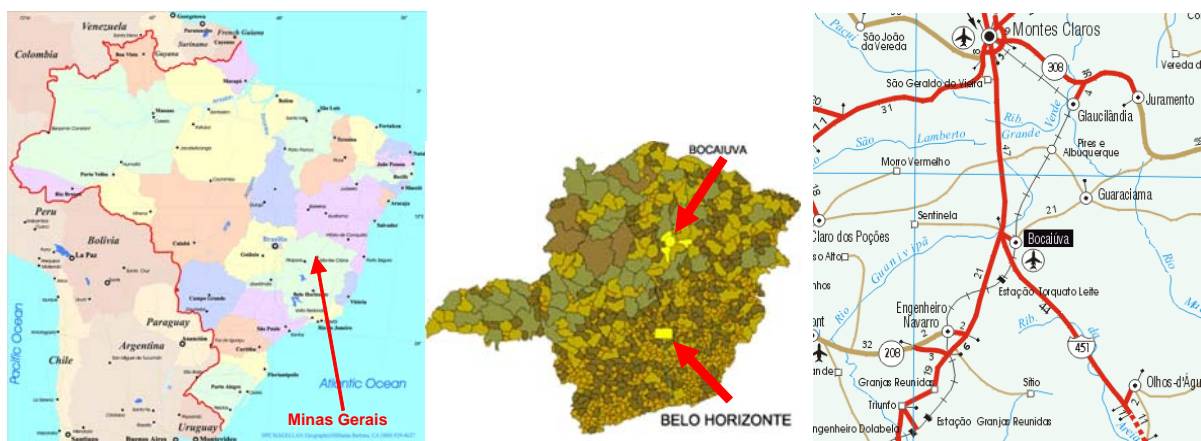


Figure 2 – Location maps of the project

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

Type I: Renewable energy projects.

Category I.C.: Thermal energy for the user.

The project displaces heavy fuel oil used in the dolomite kiln by charcoal fines, in the context of this project, a residue of renewable biomass.

The kiln was designed for a thermal capacity equivalent to 12.5 MW. Due to technical and economical reasons the capacity of the proposed project activity will not increase beyond 15 MW.

The equipment was manufactured in Brazil.

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

The emission reductions of this project activity are achieved by using renewable biomass (charcoal fines) which has a lower carbon emission factor than the fossil fuel previously used.



Charcoal is produced in the region using wood from wood plantations. Most of the charcoal used by Rima comes from its own forests.

Rima uses charcoal in their silicon and ferro-alloy production processes in all of its three plants. These processes require material above a certain size. Up to now, the charcoal fines were either burnt or sold to other companies such as a cement industry in the region.

The dolomite kiln was projected for and has been operating burning heavy fuel oil. This project will displace it by charcoal fines.

Charcoal is considered renewable biomass since it is produced in managed forests and its fines are considered residues as they were not used in Rima's processes.

All wood plantations involved in supplying charcoal for Rima are registered in official agencies (IBAMA) and have all legal permits required for supplying charcoal.

No leakage was considered (for details see sections B.2 and E.1.2.2).

The project is anticipated to generate annual emission reductions amounting to 28'849 tCO<sub>2</sub>e.

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

Years	Annual estimation of emission reductions in tonnes of CO <sub>2</sub> e
2007	28,849
2008	28,849
2009	28,849
2010	28,849
2011	28,849
2012	28,849
2013	28,849
2014	28,849
2015	28,849
2016	28,849
<b>Total (tCO<sub>2</sub>e)</b>	<b>288,491</b>
<b>Total number of crediting years</b>	<b>10 y</b>
<b>Annual average of estimated emission reductions over the crediting period (tones of CO<sub>2</sub> e)</b>	<b>28,849</b>

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

No public funding was sought for this project activity.

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



This project activity is not a debundled component of a larger project activity as there is no registered small-scale CDM project activity or an application to register another small-scale CDM project activity:

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

Furthermore, Rima, in all three plants, only bought fuel oil for this dolomite kiln and there will be no other fuel switch projects of this nature.



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

The project uses the approved baseline methodology as defined in Appendix B of the simplified modalities and procedures for small-scale CDM project activities, category I.C.: Renewable energy projects – Thermal energy for the user (Version 08, 03 March 06).

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

Category I.C – Thermal energy for the user.

*1. This category comprises renewable energy technologies that supply individual households or users with thermal energy that displaces fossil fuels.*

The project displaces fuel oil burned in a dolomite kiln with renewable biomass– charcoal fines.

*2. Where generation capacity is specified by the manufacturer, it shall be less than 15 MW.*

The kiln was built for a nominal capacity of burning 27 t / day of fuel oil.

The fuel oil used in the kiln has a LHV of 40,151 MJ/t (Balanço Energético Nacional, 2004) and, therefore, the kiln's equivalent thermal capacity is 12.5 MW which is less than the small-scale limit.

*5. The physical, geographical site of the renewable energy generation delineates the project boundary.*

The project boundary was defined as Rima's plant site in Bocaiúva.

*6. For renewable energy technologies that displace technologies using fossil fuels, the simplified baseline is the fuel consumption of the technologies that would have been used in the absence of the project activity times an emission coefficient for the fossil fuel displaced. IPCC default values for emission coefficients may be used.*

The simplified baseline is the fuel oil that would have been consumed in the baseline scenario times the IPCC default emission factor.

*8. If the energy generating equipment is transferred from another activity or if the existing equipment is transferred to another activity, leakage is to be considered.*

Since the burner for charcoal fines was newly designed and manufactured and the formerly used equipment was not transferred to another activity leakage was not considered.

*9. Monitoring shall consist of:*

*(a) Metering the energy produced by a sample of the systems where the simplified baseline is based on the energy produced multiplied by an emission coefficient.*



The metering of the energy produced is achieved by monitoring the biomass consumed times the net calorific value.

The underlying assumption for the baseline is that the fuel oil consumed in the baseline scenario times its net calorific value is equal to the charcoal fines consumed in the project activity times its net calorific value. (For details see section E)

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

The project's additionality is addressed according to Attachment A to Appendix B of the Simplified Modalities and Procedures for Small Scale CDM Project Activities (version 06, Sept.30 2005) showing "that the project activity would not have occurred anyway due to ... the following barriers:

- (a) *Investment barrier;*
- (b) *Technological barrier.*"

In the absence of this project, the most likely scenario would have been continuing operations with fuel oil.

*Investment Barrier*

In order to carry out this project, Rima developed and installed a new charcoal fines burning system and a set of conveyors, bins and controls. It also had to rearrange plant area in order to maintain the necessary stock level of fines. These investments summed, up to now (June, 2006), R\$ 534,000 (US\$ 250,000). A second set of modifications are due by November 2006 comprising recycling hot gas from the kiln to dry charcoal fines, changing kiln instrumentation and control, further modifications in the charcoal mills and sieves system and the kiln cooling system. An additional R\$ 660,000 (US\$ 308,000) are being invested.

The table below shows a summary of the projected cash flow (before taxes, depreciation and amortizations). Costs of oil, charcoal and revenues from fines were based on 2005 incurred values and national average values. The detailed documentation will be provided to the DOE during validation and verification processes.

	2006	2007	2008	2009	2010	2011	2012
Investment	-558						
Oil displaced	2.022	3.033	3.033	3.033	3.033	3.033	3.033
Charcoal purchase costs	-1.717	-2.576	-2.576	-2.576	-2.576	-2.576	-2.576
Charcoal fines lost of revenue	-308	-463	-463	-463	-463	-463	-463
<b>Result before CERs</b>	<b>-562</b>	<b>-6</b>	<b>-6</b>	<b>-6</b>	<b>-6</b>	<b>-6</b>	<b>-6</b>
CERs revenues	0	0	369	369	369	369	369
<b>Result</b>	<b>-562</b>	<b>-6</b>	<b>363</b>	<b>363</b>	<b>363</b>	<b>363</b>	<b>363</b>

values in thou USD

Exchange rate = 2.14 RS/US\$ (Valoronline, August 18, 2006)

**Table 2 – Project Cash Flow**

Using a discount rate similar to the official reference interest rate (14,5% - SELIC Source: Banco Central do Brasil, August 18, 2006), NPV yields a loss of US\$ 509,077 without CERs and a positive value of US\$ 438,927 when the CERs are included. The IRR is non-existent in the former case and 37% in the



latter. The reference for the IRR is at least 14,5% (SELIC), which would not be achieved in the absence of CER revenues.

NPV and IRR are, as expected, sensitive to variations in the price of oil and charcoal. Charcoal price followed more or less the price of fuel oil during the last 15 years and is expected, from now onwards, to be even more strictly attached to it. With a 10% increase in both oil and charcoal prices, NPV becomes a loss of US\$ 330,510 without CERs and a positive value of US\$ 601,126 when CERs are included.

This indicates that the project is not economically attractive without CER revenues.

#### *Technological Barrier*

The use of charcoal fines raises problems to Rima's operations as they usually get mixed with sand (silica) during load up at the charcoal production sites. Silica is the cause of two problems for the process:

1. In the high temperature region, close to the burner and the extraction zone of calcined dolomite, silica forms a paste that adheres to the refractory walls reducing the kiln's aperture and on that account increasing maintenance needs.
2. Silica also contributes to incomplete calcining and the material leaving the kiln still has a higher carbonate content. The calcination will be completed in later stages of the process, in the reduction furnaces, increasing the duration of the reduction cycles and reducing furnace productivity. In order to maintain the output level, Rima will raise the amount of magnesium extracted from scrap metal.

All this sums up to extra costs in terms of reduced output, additional investments and operational costs and training of personnel. Revenues from CERs are expected to cover these extra costs.

#### *National Policies and Circumstances Relevant to the Baseline*

There are no regulations limiting the continued use of fuel oil. Hence, the fuel oil consumption in the baseline would not have been reduced owing to national policies and circumstances.

<b>B.4. Description of how the definition of the project boundary related to the <u>baseline methodology</u> selected is applied to the <u>small-scale project activity</u>:</b>
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Project boundary is Rima's plant site in Bocaíuva.

To date, most of the charcoal fines needed for project activity were either burned in the reduction furnaces of all three Rima plants or sold to ceramic, cement and brick industries in the region.

The additional amount of fines required by this project will be sought by increasing the amount of charcoal bought from third parties or produced in its own areas and increasing sieve size. There is a secondary market for charcoal fines in the region, however, the traded fines feature a silica content that is incompatible with the needs of the process in Bocaíuva.

Thus, the project boundary can be limited to the industrial plant and not cover wood plantations and charcoal producer sites.

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

This project activity uses the baseline established in the simplified methodology AMS I.C. for small-scale CDM project activities which stipulates that the baseline emissions are equal to the amount of CO<sub>2</sub> emissions from the fuel oil displaced.

Date of completing the draft of this baseline section: 04/07/2006

Name of person/entity determining the baseline:

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**SECTION C. Duration of the project activity / Crediting period:****C.1. Duration of the small-scale project activity:****C.1.1. Starting date of the small-scale project activity:**

01/04/2006 (DD/MM/YYYY)

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

20 years

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

Fixed crediting period is selected.

**C.2.1. Renewable crediting period:**



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

N/A

**C.2.1.2. Length of the first crediting period:**

N/A

**C.2.2. Fixed crediting period:**

**C.2.2.1. Starting date:**

01/01/2007 (DD/MM/YYYY)

**C.2.2.2. Length:**

10y-0m

**SECTION D. Application of a monitoring methodology and plan:****D.1. Name and reference of approved monitoring methodology applied to the small-scale project activity:**

The project uses the approved monitoring methodology as defined in Appendix B of the simplified modalities and procedures for small-scale CDM project activities, category I.C.: Renewable energy projects – Thermal energy for the user (version 08, 03 March 06).

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

The choice of the methodology above is justified since the project activity meets the following applicability criteria:

- Technology/measure: The project activity uses renewable biomass (charcoal fines) to displace fossil fuel currently burnt in a calcination kiln with capacity less than 15 MW (manufacturer)
- Boundary: The project boundary is Rima's Bocaiúva plant.
- Baseline: The baseline is the fossil fuel oil that would have been consumed in the rotary kiln in the absence of the project activity times an emission coefficient.
- Monitoring: The metering of the energy produced is achieved by monitoring the biomass consumed times the net calorific value.

**D.3 Data to be monitored:**

<b>ID number</b>	<b>Data type</b>	<b>Data variable</b>	<b>Data unit</b>	<b>Measured (m), calculated (c) or estimated (e)</b>	<b>Recording frequency</b>	<b>Proportion of data to be monitored</b>	<b>How will the data be archived? (electronic/ paper)</b>	<b>For how long is archived data to be kept?</b>	<b>Comments</b>
<i>D.3.1</i>	<i>Consumption of charcoal fines at the rotary kiln</i>	<i>CC</i>	<i>t</i>	<i>m</i>	<i>daily</i>	<i>100%</i>	<i>paper/ electronic</i>	<i>End of crediting period plus 2 years</i>	<i>Data will be measured with a weigh feeder.</i>
<i>D.3.2</i>	<i>Net calorific value of charcoal fines</i>	<i>NCV_CC</i>	<i>kcal/kg</i>	<i>m</i>	<i>annually</i>	<i>sample</i>	<i>electronic</i>	<i>End of crediting period plus 2 years</i>	<i>This data will be used for emission reduction calculations.</i>
<i>D.3.3</i>	<i>Output of the dolomite kiln</i>	<i>-</i>	<i>t</i>	<i>m</i>	<i>daily</i>	<i>100%</i>	<i>paper/ electronic</i>	<i>End of crediting period plus 2 years</i>	<i>This data will be measured with a weigh feeder and used solely for checking plausibility of charcoal fines consumption.</i>



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

Data (Indicate table and ID number)	Uncertainty level of data (High /Medium/Low)	Explain QA/QC procedures planned for these data, or why such procedures are not necessary.
D.3.1	low	Measured value according to internal procedures and used for stock controls
D.3.2	low	Measured at third-party laboratory
D.3.3	low	Kiln production for plant production logs and statistics and used to countercheck charcoal fine consumption

The biomass is directly measured and monitored at the injection point of the rotary kiln. The records will be controlled and archived by the controlling department.

Periodic maintenance and calibration of measuring equipment will occur in accordance with industry standards and will be documented.

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

Rima has operation and maintenance procedures in accordance with ISO9001. Therefore, no major adaptations of the monitoring and QA/QC procedures will be required for the data relevant to the CDM project activity.

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

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**SECTION E.: Estimation of GHG emissions by sources:****E.1. Formulae used:****E.1.1 Selected formulae as provided in appendix B:**

N/A

**E.1.2 Description of formulae when not provided in appendix B:****E.1.2.1 Describe the formulae used to estimate anthropogenic emissions by sources of GHGs due to the project activity within the project boundary:**

The project activity uses renewable biomass (charcoal fines) as energy source. Hence, CO<sub>2</sub> emissions from biomass combustion are zero. Due to high prevailing temperatures (1200°C) and long residence time CH<sub>4</sub> and N<sub>2</sub>O emissions from the dolomite kiln are negligible. No fuel oil will be used.

$$PE_{boundary} = 0 \quad (1)$$

Where:

- PE<sub>boundary</sub> = Project activity emissions within project boundary [tCO<sub>2</sub>e]

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

According to methodology AMS I.C., leakage is to be considered if the energy generating equipment is transferred from another activity or if the existing equipment is transferred to another activity. Since there is no transfer in this project, there is no such source of leakage from the project.

In Northern Minas Gerais, there are several wood plantation projects dedicated to producing charcoal for the steel industry in the state. According to the Brazilian Energy Balance (2005), pig iron, steel and ferro-alloy industries accounts for more than 83% of charcoal consumption in the country.

It is therefore safe to infer that there is ample supply of charcoal and that the additional volume needed by this project activity will not compete with other uses for the biomass.

Although Rima sold around 4,000 tons of fines in 2005, this amount is significantly less than the estimated market size for fines in Northern Minas Gerais, which is deemed to be around 1,800,000 tons per year. Therefore former buyers will find ample supply of fines elsewhere.

Hence,

$$LE = 0 \quad (2)$$

Where,

- LE = Leakage [tCO<sub>2</sub>e]



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

Total greenhouse gas emissions from the small-scale project activity are:

$$PE = PE\_boundary + LE \quad (3)$$

Where:

- PE = Total project activity emissions [tCO<sub>2</sub>]

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

The baseline emissions are computed by the amount of fuel oil that would have been consumed in the baseline times by the respective emission factor.

$$BE = FO \cdot NCV\_FO \cdot EF\_FO \quad (4)$$

Where:

- BE = Baseline emissions [tCO<sub>2</sub>e]
- FO = Fuel oil consumption in the baseline [t]
- NCV\_FO = Net calorific value of fuel oil = 40,151 GJ/t (BEN 2005)
- EF\_FO = CO<sub>2</sub> emission factor from fuel oil combustion  
= carbon emission factor · fraction of carbon oxidised · molecular weight ratio  
= 21.1 tC/TJ (IPCC, 1996) · 0.99 (default IPCC, 1996) · 44/12 = 76.6 tCO<sub>2</sub>e/TJ

The calculation of the baseline fuel oil consumption is based on the assumption that the energy content (i.e. consumption times net calorific value) of the fuel oil combusted in the baseline is equal to the energy content of charcoal fines consumed by the project activity:

$$FO \cdot NCV\_FO = CC \cdot NCV\_CC \quad (5)$$

Where:

- CC = Charcoal fines consumption [t]
- NCV\_CC = Net calorific value of charcoal fines = 5,186 kcal/kg<sup>1</sup> = 21.7 GJ/t

Thus, the equivalent of the baseline fuel oil consumption is obtained as follows:

$$FO = CC \cdot \frac{NCV\_CC}{NCV\_FO} \quad (6)$$

Inserting equation ( 6 ) into equation ( 4 ):

---

<sup>1</sup> NCV was measured from Aug.2005 to Feb.2006, at a third party laboratory (Lafarge Cement). Average value is 5,186 ± 3.4% kcal/kg.



$$BE = CC \cdot NCV_{CC} \cdot EF_{FO} \quad (7)$$

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

The resulting emission reductions are:

$$ER = BE - PE \quad (8)$$

Where:

- ER = Emission reductions due to the project activity (tCO<sub>2</sub>e)

Inserting equations ( 3 ) and ( 7 ) leads to:

$$ER = CC \cdot NCV_{CC} \cdot EF_{FO} \quad (9)$$

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

Years	Annual estimation of fuel oil consumption (tonnes)	Annual estimation of charcoal fine consumption (tonnes)	Annual estimation of emission reductions in tonnes of CO <sub>2</sub> e
2007	9.381	17.347	28.849
2008	9.381	17.347	28.849
2009	9.381	17.347	28.849
2010	9.381	17.347	28.849
2011	9.381	17.347	28.849
2012	9.381	17.347	28.849
2013	9.381	17.347	28.849
2014	9.381	17.347	28.849
2015	9.381	17.347	28.849
2016	9.381	17.347	28.849
<b>Total (tCO<sub>2</sub>e)</b>			288.491
Total number of crediting years			10 y
Annual average of estimated emission reductions over the crediting period (tones of CO <sub>2</sub> e)			28.849

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

For this project, Brazilian environmental law does not require specific Environmental Assessment Studies as the impact will be reduced by switching fuels. Rima's plant in Bocaiúva has all necessary environmental licences and permits required by authorities. In addition to complying with legislation, Rima developed an Environmental Control Plan for the whole plant, which evaluates the environmental aspects of the projects, trying to minimize the negative impacts.

Although outside the scope of this project, Rima has all necessary licences and permits to explore its managed forests projects and produce charcoal. Furthermore, all charcoal bought from third party companies is fully certified, according to Brazilian law.

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

The legislation requests the announcement of the issuance of the environmental licenses in the local state official journal (*Diário Oficial do Estado*) and in a local newspaper to make the process public and allow stakeholders' comments.

Brazilian DNA (Interministerial Commission on Global Climate Change – CIMGC/MCT) released Resolution #1 defining the necessary procedures of stakeholder communications for projects in Brazil.

In order to comply with this resolution, Rima Industrial issued letters to stakeholders, describing the project and inviting comments from the following stakeholders:

- Environment Secretary of the State of Minas Gerais;
- Fórum Brasileiro de ONGs e Movimentos Sociais para o Meio Ambiente e Desenvolvimento;
- Conselho Municipal de Desenvolvimento Ambiental do Município de Bocaiúva, Minas Gerais;
- Mayor, President of the County Hall and Secretary in charge of Environment of the county of Bocaiúva, in the state of Minas Gerais;
- State Attorney Office of Minas Gerais (Procuradoria do Ministério Público de Minas Gerais);
- State Forestry Institute of Minas Gerais (IEF – MG);
- Store Owner Association in Bocaiúva, Minas Gerais.

**G.2. Summary of the comments received:**

No comments were received.

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

No comments were received.

**Annex 1****CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY**

(Rima's administrator)

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**Annex 2**

**INFORMATION REGARDING PUBLIC FUNDING**

No public funding from Annex I parties was or will be sought for project activities.

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