I. CLEAN DEVELOPMENT MECHANISM

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

CONTENTS

Revision history of this document

Version Number	Date	Description and reason of revision
01	January 21, 2003	Initial adoption
02	July 8, 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	December 22, 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:

>>
Malhas Menegotti Industria Textil – Fuel Switch Project
Version 04
April 30, 2014

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

>>
The Malhas Menegotti Industria Textil – Fuel Switch Project developed by Mallhas Menegotti is a biomass fuel switch project for the production of thermal energy. The project replaces residual fuel oil (RFO) BPF 1A fired boilers and thermal fluid heater with biomass residues (wood chip) from the sustainable management. The boilers and thermal fluid heater are used to provide thermal energy to the plant.

Malhas Menegotti was founded in 1980 by Ademar Menegotti and Cecília Rubini Menegotti, producing cotton jersey to supply to retail regional market. Currently, Malhas Menegotti produces cotton jersey and fabric to national market.

The project activity reduces greenhouse gas emissions by replacing of residual fuel oil BPF 1A by wood chip in boilers and thermal fluid heater at the project site. Furthermore, the project will help to meet the sustainable development goals of the Brazil by providing the following benefits:

Sustainable development

This local and cleaner source of thermal energy has an important contribution to environmental sustainability by reducing carbon dioxide emissions that would have occurred otherwise in the absence of the project. The project activity reduces emissions of greenhouse gas (GHG) by reducing the combustion of fossil fuel source – residual fuel oil, which would be generating in the absence of the project. The project activity will contribute to:

- Generate clean energy which will be supplied to local manufactory;
- Create new jobs direct and indirect during the crediting period.
- Train employees in order to (i) meet the new project activity requirements, (ii) introduce new operational processes and, (iii) new maintenance procedures;
- Improve local air quality;
- Generate local income;
- Reduce the amount of GHG emissions and other pollutants;
- Avoid the decay of biomass residues on fields; and
- Avoid the use of biomass for other purposes rather than for energy purposes.

NOTE: The Menegotti Project is according to the Standard of ABNT NBR 15948:2011. This Standard specifies principles, requirements and guidelines to commercialize verified emission reduction in the Brazilian voluntary carbon market.

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)
Brazil (host Party)	AMC Têxtil Ltda (private entity)	No
	Ciclo Ambiental Engenharia Ltda. (private entity)	
(*) 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.		

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

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):

>>

Brazil.

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

>>

Santa Catarina.

A.4.1.3. City/Town/Community etc:

>>

Jaraguá do Sul.

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

>>

The project activity is located at Malhas Menegotti plant at the intersection of latitude 26°28’52.60”S and longitude 49°08’35.73” W. Jaraguá do Sul is a city of around 143,123 inhabitants, according to IBGE, 2010.

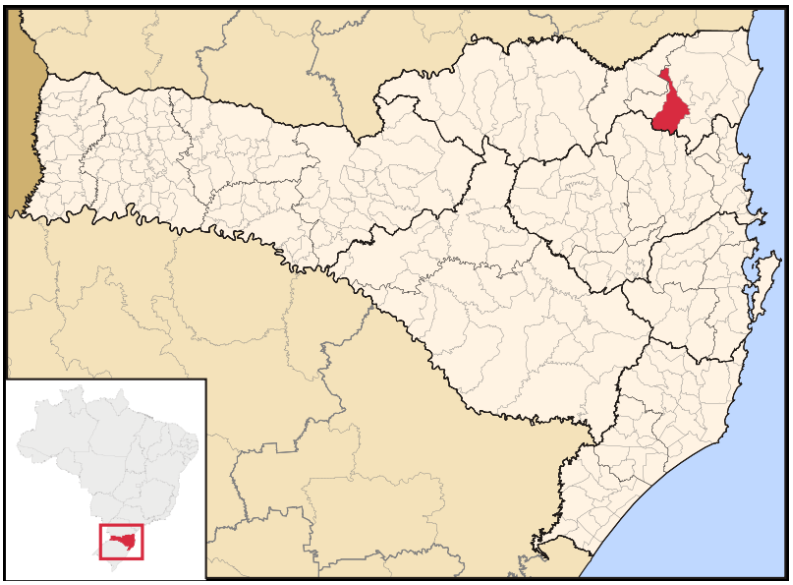


Figure 1 – Jaraguá do Sul city location

Figure 2 - Location of the Menegotti project

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

>>

As per "Appendix B to the simplified modalities and procedures for small – scale CDM project activities" the project activity falls under Type(I) *'renewable energy project activities'* and category *I.C 'thermal energy, to the user directly'*. The project conforms to the project category since the nominal installed capacity of the Project is below the 45 $MW_{thermal}$.

The proposed CDM project activity replaces the existing fired boiler with residual fuel oil BPF 1A by a new fired boiler with biomass (wood chip), in order to supply steam/heat to the plant. The fuel switching process, results in replacing the steam/heat system due to the different characteristics of the biomass fuel in comparison to the residual fuel oil BPF 1A.

The consumption of residual fuel oil BPF 1A in baseline scenario is about 800 tonnes/month to generate steam/heat to Menegotti Project.

Technology Employed

The proposed project activity comprises of generating biomass based thermal energy of the manufacturing unit at Malhas Menegotti. The technology proposed for the project activity involves direct combustion of biomass (wood chip) in the boiler and thermal fluid heater to generate thermal energy. During combustion chemical energy contained in the biomass is converted into thermal energy, which is utilized for steam/heat generation.

Boilers

In Menegotti Project a new biomass boiler was bought to substitute the amount of steam/heat supplied by three of the residual fuel oil BPF 1A fired boilers. During project activity the three residual fuel oil BPF 1A fired boilers will remain on-site for stand-by and maintenance purposes only.

The biomass requirement of the generating unit is about 292.6 m^3/day. The new boiler has been specially designed for burning biomass. The boilers conform to the requirements of the local regulation. A brief description of the boilers is given below:

Biomass boiler

Figure 3 - Biomass boiler

- This boiler can generate 19 TPH[1] steam at 8 kg/cm^2.
- Boiler efficiency: 83%[2].
- Nominal Capacity: 14.63 MWth;
- Date of manufacturing: 2006;
- Manufactured by H. Bremer;
- Nominal life time: 25 years (by regulation – ABNT NR13);
- Fuel used is wood chip (to 50% humidity);
- Status: in operation.

[1] TPH: tonnes per hour

[2] The efficiency was informed by H. Bremer and the evidence was shown to DOE in validation visit.

Residual fuel oil BPF 1A boilers

Figure 4– Boiler 1

Boiler 1

- This boiler can generate 8 TPH steam at 8 kg/cm^2.
- Boiler efficiency: 87%[3].
- Nominal Capacity: 6.16 $MW_{th;}$
- Date of manufacturing: 2000;
- Manufactured by H. Bremer;
- Nominal life time: 25 years (by regulation – ABNT NR13);
- Fuel used is residual fuel oil BPF 1A;
- Status: in stand-by.

Figure 5 – Boiler 2

Boiler 2

- This boiler can generate 8 TPH steam at 8 kg/cm^2.
- Boiler efficiency: 87%[4].
- Nominal Capacity: 6.16 $MW_{th;}$
- Date of manufacturing: 1997;
- Manufactured by H. Bremer;
- Nominal life time: 25 years (by regulation – ABNT NR13);
- Fuel used is residual fuel oil BPF 1A;
- Status: in stand-by.

Figure 6 – Boiler 3

Boiler 3

- This boiler can generate 8 TPH steam at 8 kg/cm^2.
- Boiler efficiency: 87%[5].
- Nominal Capacity: 6.16 $MW_{th;}$
- Date of manufacturing: 1993;
- Manufactured by H. Bremer;
- Nominal life time: 25 years (by regulation – ABNT NR13);
- Fuel used is residual fuel oil BPF 1A;
- Status: in stand-by.

[3] The efficiency was informed by H. Bremer and the evidence was shown to DOE in validation visit.

[4] The efficiency was informed by H. Bremer and the evidence was shown to DOE in validation visit.

[5] The efficiency was informed by H. Bremer and the evidence was shown to DOE in validation visit.

Thermal fluid heater

The technology involves direct combustion of fuel (residual fuel oil BPF 1A or biomass) in the thermal fluid heaters to generate heat. By burning the fuel chemical energy contained in it is converted into thermal energy, which is utilized for heating the thermal fluid. The thermal fluid, which acts as a heat carrier, is heated up in the heater and circulated through the user equipment. There it transfers heat for the process through a heat exchanger and the fluid is then returned to the heater.

In Menegotti Project a new biomass thermal fluid heater was bought to substitute the amount of heat supplied by one of the residual fuel oil BPF 1A fired thermal fluid heater. During project activity the residual fuel oil BPF 1A fired thermal fluid heater will remain on-site just for stand-by and maintenance purposes. The biomass requirement of the generating unit is about 125 m^3/day. The thermal fluid heater has been specially designed for burning biomass. The thermal fluid heaters conform to the local regulation requirements. A brief description of the thermal fluid heaters is given below.

Biomass thermal fluid heater

- This thermal fluid heater can produce heat energy of 4,000 Mcal/hr at 0.5 kg/cm^2;
- Boiler efficiency: 83%[6];
- Nominal Capacity: 4.65 MW_{th};
- Date of manufacturing: 2006;
- Manufactured by H. Bremer;
- Nominal life time: 25 years (by regulation – ABNT NR13);
- Fuel used is wood chip (to 50% humidity);
- Status: in operation.

Residual fuel oil thermal fluid heater

- This thermal fluid heater can produce heat energy of 5,000 Mcal/hr at 0.5 kg/cm^2;
- Boiler efficiency: 84%[7];
- Nominal Capacity: 5.82 MW_{th};
- Date of manufacturing: 2007;
- Manufactured by Konus (WEISHAUPT);
- Nominal life time: 25 years (by regulation – ABNT NR13);
- Fuel used is residual fuel oil;
- Status: in stand-by.

[6] The efficiency was informed by H. Bremer and the evidence was shown to DOE in validation visit

[7] The efficiency was informed by Konus and the evidence was shown to DOE in validation visit

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

>>

The chosen crediting period (from September 1, 2006 to August 31, 2013) is 7 years which is fixed crediting period. Estimated amount of emission reductions over these 7 years is as follows:

Years	Annual estimation of emission reductions in tonnes of CO2e
September 1, 2006	13,010
2007	52,363
2008	52,363
2009	52,363
2010	52,363
2011	52,363
2012	52,363
August 31, 2013	34,908
Total estimated reductions (tCO_2e)	**362,096**
Total number of crediting years	**07**
Annual average over the crediting period of estimated reductions	**51,728**

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

>>

There is no Annex 1 public funding involved in the Menegotti Project.

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

Paragraph 2 of Appendix C of the Simplified Modalities and Procedures for Small Scale CDM project activities states that:

"2. A proposed small-scale project activity shall be deemed to be a debundled component of a large project activity if there is a 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."*

As none of the above condition is applicable to this CDM project activity, it is not a debundled component of a large-scale project activity.

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:

>>

As per simplified modalities and procedures of small scale CDM project activity, the title and reference of the methodology adopted for this project is as follows:

- Title: Type I- Renewable Energy Projects
- Category: C. Thermal energy production with or without electricity (Version 19, of AMS-I.C)
  - Tool to calculate project or leakage CO2 emissions from fossil fuel combustion (version 02);
  - Tool to calculate baseline, project and/or leakage emissions from electricity consumption (version 01).

The Version 19 of the proposed methodology establishes two conditions in its paragraphs #10 and #11, as follows:

#10 *If solid biomass fuel (e.g. briquette) is used, it shall be demonstrated that it has been produced using solely renewable biomass and all project or leakage emissions associated with its production shall be taken into account in the emissions reduction calculation.*

#11 *Where the project participant is not the producer of the processed solid biomass fuel, the project participant and the producer are bound by a contract that shall enable the project participant to monitor the source of the renewable biomass to account for any emissions associated with solid biomass fuel production. Such a contract shall also ensure that there is no double-counting of emission reductions.*

Explanation to #10 can be provided by contracts made with the biomass providers, proving the renewability of the biomass used. As for taking into account in the emissions reduction calculation regarding this production, the biomass fuel used in those projects is characterized as waste in all situations: eucalyptus management residues, city tree pruning and furniture industry residues, that otherwise (if not used by Menegotti's plant) would naturally decompose (in site or if taken to a landfill) and probably generate methane, due to process related to decomposition.

Regarding #11, as the solid biomass fuel production won't be accounted and included in the emissions reduction calculation, due to the explanation already given, it's assured that the double-counting emissions won't happen.

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

>>

- *AMS.I.C – Thermal energy production with or without electricity*. The project activity use wood chip, renewable biomass, to generate thermal energy for the boiler and thermal fluid heater of Malhas Menegotti In the baseline scenario the fuel employed is the residual fuel oil, a high-pollutant fossil fuel.

The proposed activity is eligible to apply the following monitoring methodology:

- AMS.I.C since the project involves the supply of the thermal energy means of a renewable source of biomass that displaces fossil fuels and the aggregate installed capacity of the units will not exceed 45 MW_{th}.

Justification

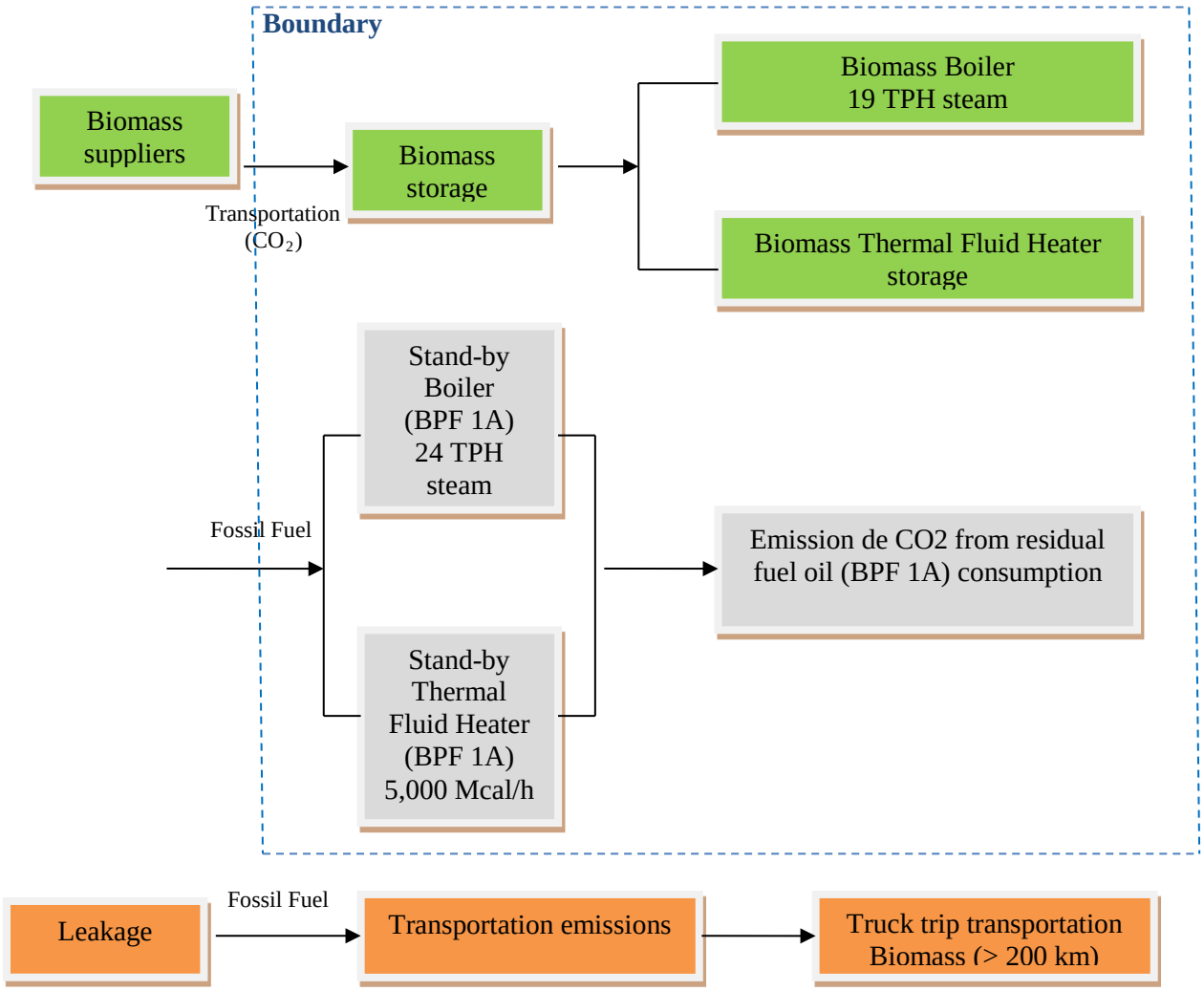
- The project activity supplies thermal energy to Malhas Menegotti plant.
- As per manufacturer specification, the total thermal generation capacity is **19.28 MW_{th},** which is less than 45 MW_{th}.

B.3. Description of the project boundary:

>>

The project boundary is limited to the physical, geographical site of the renewable energy generation. Project activity displaces fossil fuel supplied by external source to renewable source of thermal energy.

According to the selected approved project category the project boundary has been described as the physical, geographical site of the renewable energy generation project. The project boundary covers entire area from the point of fuel supply from the different sources/supplier to the point of thermal energy (steam/heat) generation which is strictly used for production processes. Thus, boundary covers transport of fuel and boilers and thermal fluid heaters consuming equipments. The project participant does not need to account potential CH_4 emissions from the storage of biomass because the period of storage is 20 days. For the project activity the project boundary can be schematically presented as follows:



The biomass used is wood chip and waste wood chip. The residue comes from furniture industry in the region and city tree pruning. The wood chip comes from the forests of eucalyptus and pine of the region, with removal of branches and roots, preventing decomposition and generation of CH4 in forest management. Some of these suppliers are certified by FSC (Forest Stewardship Council), in other words, are sustainable forest management suppliers.

Off-site transportation of biomass residues: Emission of CO_2 from transportation of biomass residues (wood chip). If biomass residues are transported over a distance of more than 200 kilometers due to the implementation of the project activity then this leakage source attributed to transportation shall be considered, otherwise it can be neglected[13].

The suppliers have a contract with Malhas Menegotti for ten years, but the industry is not regulated, so the suppliers change with the availability and price of biomass energy (wood chips). So in addition to create a loyalty with suppliers, the family owns the Malhas Menegotti also acquired land to plant eucalyptus and pine with sustainable forest management.

Paragraph 15 (d) of the Version 19 of the methodology used states that: “the spatial extent of project boundary encompasses the processing plant of biomass residues, for project activities using biomass fuel unless all associated emissions are accounted for as leakage emissions”. However, since the solid biomass used would have a destination capable of resulting in GHG emissions if not utilized by the plant, as already explained in section B.1 of this PDD, the emissions related to the processing plant of biomass (more specifically, furniture industries) won’t be considered, even though applicability condition 10 and project boundary condition 15 (d) are technically not met.

The greenhouses gases included in or excluded from the project boundary are shown in table below.

	Source	Gas	Included?	Justification / Explanation
Baseline	Emissions from thermal energy generation	CO_2	Yes	The source of emissions in the baseline
		CH_4	No	Excluded for simplification. This is conservative.
		N_2O	No	Excluded for simplification. This is conservative.
Project Activity	On-site fossil fuel consumption	CO_2	Yes	Emission of CO_2 from fossil fuel (residual fuel oil BPF 1A) consumption in standby equipments.
		CH_4	No	Excluded for simplification. This emission source is assumed to be very small.
		N_2O	No	Excluded for simplification. This emission source is assumed to be very small.
	Off-site transportation of biomass residues	CO_2	Yes	This leakage source attributed to transportation shall be considered, otherwise it can be neglected.
		CH_4	No	Excluded for simplification. This emission source is assumed to be very small.
		N_2O	No	Excluded for simplification. This emission source is assumed to be very small.
	Biomass storage	CO_2	No	It is assumed that CO2 emissions from surplus biomass residues do not lead to changes of carbon pools in the LULUCF sector.
		CH_4	No	Excluded for simplification. Since biomass residues are stored for not longer than one year, this emission source is assumed to be small. In case of the project, the biomass residues are stored for not longer than 20 days.
		N_2O	No	Excluded for simplification. This emissions source is assumed to be very small.

B.4. Description of baseline and its development:

>>

Baseline as per Paragraphs 16, 17 and 18 of "*Type AMS. I. C. Thermal energy production with or without electricity (Version 19)*" of Appendix B of the simplified M&P for small-scale CDM project activities states that:

> *"16. 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 factor for the fossil fuel displaced."*
> *"17. Existing facilities are those that have been in operation for at least three years immediately prior to the start date of the project activity. For project activities implemented in existing facilities, baseline calculations shall be based on historical data on energy use (e.g. electricity, fossil fuel) and plant output (e.g. steam/electricity) in the baseline plant for at least three years prior to project implementation."*
> *"18. For project activities implemented in existing facilities where the additionality is demonstrated based on a baseline scenario that is not the continuation of the current practice (e.g. continued use of the fossil fuel that was used prior to the implementation of the project activity), the baseline emission factor is chosen as lower of the two: (a) the emission factor of the fossil fuel that would have been used in the identified baseline scenario; and (b) the emission factor of the fossil fuel that was used prior to the implementation of the project activity."*

The baseline for the renewable thermal energy generation, which displaces residual fuel oil BPF 1A is the amount of BPF 1A used (TJ) to produce 18-19 tonnes of steam per hour at 8 kgf/cm² (170°C) with three boilers and one thermal fluid heater. The annual consumption at Menegotti Project is about 9,600 tonnes of residual fuel oil BPF 1A with net calorific value of 9,750 kcal/kg, totalizing 385 TJ/year. It is expected a 25 tonnes of residual fuel oil BPF 1A monthly consumption just for its preventive maintenance purpose, which shall be discounted from baseline. From 2008 until the end of the crediting period, the value was maintained as a conservative number for residual fuel oil BPF 1A consumption forecast.

The calculation 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 is provided in section B.6.3.

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:

The approved methodology AMS-I.C. (version 19) prescribes the use of Attachment A to Appendix B of the UNFCCC's Simplified Modalities and Procedures for Small-scale CDM Project Activities for determining whether the project is additional. The attachment A asks the project owners to justify the additionality by showing that the project activity (and so the GHG emission reduction) faced one or more of the prohibitive barriers listed below:

- Investment barrier;
- Technological barrier;
- Barrier due to prevailing practice; or
- Other barriers.

In absence of the project activity the most likely scenario would be the use of residual fuel oil BPF 1A in the operation of the boilers and thermal fluid heater.

Despite the barriers associated with the project, Malhas Menegotti decided to implement it. The fact that the project would be able to benefit from carbon credits was one of the key factors in the decision making.

a) Investment barrier

The investment analysis was done according to *"Annex 35 - Guidance on the assessment of investment analysis"* of EB 39[8]. The analysis considered a period of 25 years, which is in line with the operational lifetime of the project activity.

The financial indicator used to establish additionality is the Project IRR.

The project does not represent an attractive investment opportunity due to the low income from the fuel switching (from oil to wood chip) saved along the project lifetime.

An IRR is calculated for the project and as can be seen from the financial data displayed in Annex 5, the Project IRR for the plant is not high enough, considering the risks involved from the fuel price variation, between oil and wood chip. Actually, as the cash flow does not have any positive values in the project's lifetime, it was not possible to obtain an IRR calculation, as shown in Annex 5.

With the ERT's revenue incorporated into the Project IRR calculation, the additional revenue stream provides enough of an incentive for the Project Developer to proceed.

Financial Indicator, Internal Rate of Return (IRR)

The project's cash flow in Annex 5 shows that the Project IRR without ERT's income does not exist as the cash flow shows to be negative along all the period analyzed. This evidences that the project activity is not financially attractive to the investor, as the minimal SELIC observed, 11.18 % p.a.

The sensitive analysis is conducted to check whether, under reasonable variations in the critical assumptions, the project IRR remains below the benchmark IRR. The three main factors affecting the financial indicators of the project are:

- Capex;
- Wood chip;
- O&M.
- RFO BPF 1A (residual fuel oil)

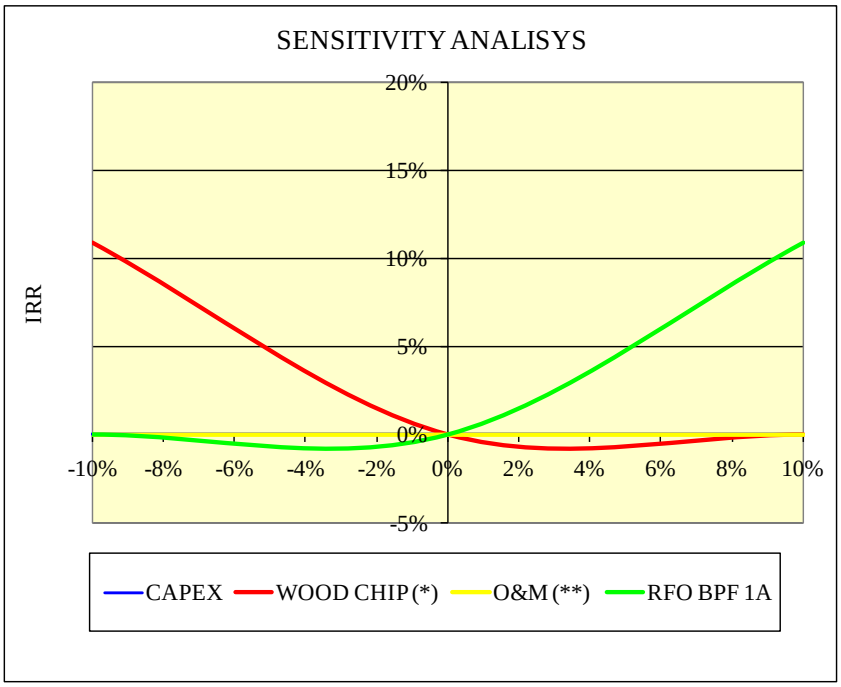
Those parameters were selected as being the most likely to fluctuate over time.

The sensitivity analyses were performed altering each of these parameters by +/- 10%, and assessing the correspondent impact on the Project IRR would be.

[8] Available on http://cdm.unfccc.int/EB/039/eb39_repan35.pdf

SENSITIVITY ANALISYS		% Variation	IRR	NPV
CAPEX	R$ 2,848,500.00	-10%	-	-R$ 3,710,706.02
	R$ 3,165,000.00	0%	-	-R$ 3,990,794.51
	R$ 3,481,500.00	10%	-	-R$ 4,589,467.08
Wood chip (*)	R$ 28.80	-10%	10.91%	-R$ 348,223.30
	R$ 32.00	0%	-	-R$ 3,990,794.51
	R$ 35.20	10%	-	-R$ 8,474,852.58
O&M (**)	R$ 30,600.00	-10%	-	-R$ 3,611,898.06
	R$ 34,000.00	0%	-	-R$ 3,990,794.51
	R$ 37,400.00	10%	-	-R$ 4,370,575.93
RFO BPF 1A	R$ 0.6485	-10%	-	-R$ 8,480,637.35
	R$ 0.7206	0%	-	-R$ 3,990,794.51
	R$ 0.7927	10%	10.94%	-R$ 343,714.95

(*) The wood chip shows strong volatility, as a narrow price shift (+/- 1.95 %) results on a high Project IRR change, from – 17.71 % to 8.41%. This volatility also shows that the project activity is very risky to the investor, if the CDM revenue from ERT's is not taken into account.
(**) An annual inflation of 5% (IPCA[9]) is taken into account on the O&M calculation.



(*) The wood chip shows strong volatility, as a narrow price shift (+/- 1.95 %) results on a high Project IRR change, from – 17.71 % to 8.41%. This volatility also shows that the project activity is very risky to the investor, if the CDM revenue from ERT's is not taken into account.
(**) An annual inflation of 5% (IPCA[10]) is taken into account on the O&M calculation.

[9] IPCA: Extended National Consumer Price Index. More details on http://www.ibge.gov.br/english/presidencia/noticias/noticia_visualiza.php?id_noticia=1280&id_pagina=1

[10] IPCA: Extended National Consumer Price Index. More details on http://www.ibge.gov.br/english/presidencia/noticias/noticia_visualiza.php?id_noticia=1280&id_pagina=1

Thus, the Project IRR without being registered as a CDM project evidences that the project activity is not financially attractive to the investor.

b) Prevailing Practice

The predominant technology used in these industries is residual fuel oil BPF 1A fired boilers. Those are easier to operate, as the fuel comes, it is just put it on a tank, usually with a high capacity. Also this fuel is more available in the market, with a larger number of providers.

Beyond the issues above, the use of wood chip requires a larger amount of employees, once the boiler needs to be supplied more frequently, and a place to stock the wood chip is required, once it comes in a large quantity. Therefore the common practice of the project's boundary is the residual fuel oil boiler.
The proposed project will reduce GHG emission below levels produced by the traditional boilers, or predominant technology (common practice) by changing the fuel: replacing a fossil fuel by a renewable biomass fuel.

c) Regulatory Surplus

In relation to existing laws, regulation, statutes, legal ruling, or other regulatory framework in effect now or to begin soon, there is nothing that requires this kind of industry to implement clean source for thermal energy, or similar. The option of replacing residual fuel oil BPF 1A by wood chip in boilers and thermal fluid heater at the project site reduce the greenhouse gas emissions.

Implementation timeline of the proposed CDM project activity.

The following table shows the key events of the proposed project:

Table 1 - Timeline of the project key events[11]

Event	Date
Investment decision	January 16, 2006
CDM Proposal	April 12, 2006 June 26, 2006
Purchase of biomass boiler	July 24, 2006
Starting date of the project activity	September 1, 2006
Installation finished	October 10, 2006
Commissioning started	November, 2006
Operation started (Biomass Heater)	January 2007

[11] The evidences were shown to DOE in validation visit. A detailed timeline of the project activity is available in Annex 6.

Consideration of CDM

This boilers and thermal fluid heater fuel switching project was seriously considered as CDM project activity in the Malhas Menegotti Board of Directors meeting held on January 16, 2006 and the project was planned as a CDM project[12].

B.6. Emission reductions:

B.6.1. Explanation of methodological choices:

>>

The emission reductions can be calculated using the following formula:

$$ER_y = BE_y - PE_y - L_y$$

Where:

ER_y	Emissions Reductions (tCO_2e) in year y
BE_y	Baseline emissions (tCO_2e) in year y
PE_y	Project emissions (tCO_2e) in year y
L_y	Leakage (tCO2e) in year y

1. Baseline emissions

As described in section *B.4*, the proposed baseline is the GHG emissions that would have occurred due to use of residual fuel oil BPF 1A in the boilers or thermal fluid heater in absence of this project activity.

Baseline emissions due to burning of residual fuel oil BPF 1A in boilers and thermal fluid heater are calculated based on the steam/heat generated from burning of residual fuel oil BPF 1A. Total heat content of the steam generated in boilers and total heat supplied by the thermal fluid heater to the thermal fluid is taken into account for baseline calculations.

The baseline methodology is applied in the context of the project activity. For steam/heat produced using fossil fuels the baseline emissions are calculated as follows:

$$BE_{thermal,CO2,y} = \left(\frac{EG_{thermal,y} \times EF_{FF,CO2}}{\eta_{thermal,B}} \right) + \left(\frac{HG_{thermal,y} \times EF_{FF,CO2}}{\eta_{thermal,H}} \right)$$

Where:

$BE_{thermal,CO2,y}$	the baseline emissions from steam/heat displaced by the project activity during the year y tCO_2e.
$EG_{thermal,y}$	net quantity of steam supplied by the boilers during the year y, TJ.
$HG_{thermal,y}$	net quantity of steam supplied by the thermal fluid heater during the year y in TJ.
$EF_{FF, CO2}$	the CO_2 emission factor of the fuel that would have been used in the baseline plant (tCO_2/TJ), obtained from reliable local or national data if available, otherwise, IPCC default emission factors are used.

[12] The evidence was shown to DOE in validation visit.

$\eta_{thermal,\,B}$	Efficiency of the boiler using fossil fuel that would have been used in the absence of the project activity.
$\eta_{thermal,H}$	Efficiency of the thermal fluid heater using fossil fuel that would have been used in the absence of the project activity.

2. Project emissions

There are project emissions.

$$PE_{yb} = HG_y \times IHP_y \times E_y \times 10\text{^} - 9$$

Where:

$PE_{y\,b}$	Project emissions (tCO_2e) in monitoring period;
HG_y	net quantity of fuel oil BPF-1A/Shale Oil used in boiler and heater;
IHP_y	Inferior Heat Power[13];
E_y	Energy = 4,1868 (to transformed in kJ);
10^-9	1kJ = $10^{\text{^-9}}$TJ.

3. Leakage

Paragraph 29 of "AMS I.C. Thermal energy production with or without electricity (Version 16)" states that:

> *"29. In case collection/processing/transportation of biomass residues is outside the project boundary CO2 emissions from collection/processing/transportation[14] of biomass residues to the project site."*

As the maximum round trip distance (from and to) between the biomass residue fuel supply sites and the site of the project plant is between 170 and 230 kilometers, the leakage source attributed to transportation shall be considered, otherwise it can be neglected, depending on suppliers and emissions in the monitoring period to be checked timely[13].

$$L_y = PE_{ya} = N_y \times AVDB_{yp} \times EF_{km,CO2,y}$$

Where:

$PE_{y\,a}$	Project emissions (tCO_2e) in monitoring period;
N_{yp}	Number of truck trips during the monitoring period[15];
$AVDB_{yp}$	Average round trip distance (from and to) between the biomass supply sites and the site of the project plant during the monitoring period (km);

[13] The value of IHP to BPF and Shale Oil were considerated 9.750 kCal/kg and 9.700 kCal/kg, respectively . The value is in table Aalborg Industries in Annex 1c' and Annex 1 c".

[14] If biomass residues are transported over a distance of more than 200 kilometers due to the implementation of the project activity then this leakage source attributed to transportation shall be considered, otherwise it can be neglected.

[15] Truck trips are calculated to biomass truck trips.

$EF_{km, CO2,y}$	Average CO_2 emission factor for the trucks (tCO_2/km)[16]. (Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories: Reference Manual, Moderate Control index for US Heavy Duty Diesel Vehicles in Table 1-32, p. 1.75. (1011 gCO2/km or 0.001011 tCO2/km) Anexx 01n.

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

Data / Parameter:	***$EF_{FF, CO2}$* - CO_2 emission factor for residual fuel oil (BPF 1A or RFO)**
Data unit:	tCO_2/TJ
Description:	Quantity of CO_2 emitted in tonnes per TJ of energy generated by burning of BPF 1A (RFO).
Source of data used:	Volume 2 of 2006 IPCC guidelines for National Greenhouse Gas Inventories.
Value applied:	77.4
Justification of the choice of data or description of measurement methods and procedures actually applied :	IPCC was chosen as the source for reliable data for emissions factors.
Any comment:	Referring table 2.3 of chapter 2 of volume 2 of 2006 IPCC guidelines, value for CO_2 emission factor for BPF 1A (RFO) is 77,400 $kgCO_2/TJ$, which is equal to 77.4 tCO_2/TJ.

Data / Parameter:	***$EF_{FF, CO2}$* - CO_2 emission factor for residual shale oil (OTE or OTL)**
Data unit:	tCO_2/TJ
Description:	Quantity of CO_2 emitted in tonnes per TJ of energy generated by burning of OTE (OTL).
Source of data used:	Volume 2 of 2006 IPCC guidelines for National Greenhouse Gas Inventories.
Value applied:	73.3
Justification of the choice of data or description of measurement methods and procedures actually applied :	IPCC was chosen as the source for reliable data for emissions factors.
Any comment:	Referring table 2.3 of chapter 2 of volume 2 of 2006 IPCC guidelines, value for CO_2 emission factor for BPF 1A (RFO) is 73,300 $kgCO_2/TJ$, which is equal to 73.3tCO_2/TJ.

Data / Parameter:	**$\eta_{thermal, B}$**
Data unit:	%
Description:	Efficiency of the boiler using fossil fuel that would have been used in the absence of the project activity
Source of data used:	
Value applied:	87
Justification of the choice of data or	The Project Participants (PPs) chose the highest of the efficiency values provided by two manufacturers (H. Bremmer and Aalborg Industries) for units

[16] this value was used according to the IPCC: http://www.ipcc-nggip.iges.or.jp/public/gl/invs6a.html - pages 61-80

or http://www.ipcc-nggip.iges.or.jp/public/gl/guidelin/ch1ref4.pdf

description of measurement methods and procedures actually applied :	with similar capacity, according to Paragraph# 30 option b) of AMS-1.C – version 19. There is no data available to adopt the option a). The both boiler efficiencies by H. Bremmer and Aalborg Industries were 87%[17]. Therefore, the efficiency of the boiler using fossil fuel chosen was 87%.
Any comment:	The evidences of the boiler efficiency by H. Bremer and Aalborg were shown to DOE in validation visit.

Data / Parameter:	$\eta_{thermal,H}$
Data unit:	%
Description:	Efficiency of the thermal fluid heater using fossil fuel that would have been used in the absence of the project activity
Source of data used:	
Value applied:	84
Justification of the choice of data or description of measurement methods and procedures actually applied :	The Project Participants (PPs) chose the highest of the efficiency values provided by two manufacturers (Konus and Aalborg Industries) for units with similar capacity, according to Paragraph# 30 option b) of AMS-1.C – version 19. There is no data available to adopt the option a). The thermal fluid heater efficiencies by Konus and Aalborg Industries were 84% and 83%, respectively[18]. Therefore, the efficiency of the thermal fluid heater using fossil fuel chosen was 84%.
Any comment:	The evidences of the thermal fluid heater efficiencies were shown to DOE in validation visit.

Data / Parameter:	**Net calorific value of residual fuel oil (BPF-1A or RFO).**
Data unit:	kcal/kg
Description:	Net calorific value of residual fuel oil
Source of data used:	Aalborg Industries data suppliers. Density and Net Calorific Power.
Value applied:	9,750
Justification of the choice of data or description of measurement methods and procedures actually applied :	The data from fuel oil and shale oil suppliers are accurate and credible for the Project Design. Also, the value of 9.750 kcal/kg is similar to any of the fuels to be used as can be evidenced in the Aalborg data.
Any comment:	-

Data / Parameter:	**Net calorific value of residual shale oil (OTE or OTL).**
Data unit:	kcal/kg
Description:	Net calorific value of residual fuel oil
Source of data used:	Petrobras data suppliers. Density and Net Calorific Power.
Value applied:	9,750
Justification of the choice of data or	The data from fuel oil and shale oil suppliers are accurate and credible for the Project Design.

[17] Documents proving this information were shown to DOE.

[18] Documents proving this information were shown to DOE.

description of measurement methods and procedures actually applied :	Also, the value of 9.750 kcal/kg is similar to any of the fuels to be used as can be evidenced in the Petrobras data.
Any comment:	-

Data / Parameter:	**SBC**
Data unit:	m^3 of biomass/MWh_{th}
Description:	Specific biomass consumption per unit of thermal energy generated
Source of data used:	Project developer
Value applied:	960
Justification of the choice of data or description of measurement methods and procedures actually applied :	Value reached from the residual fuel oil energy consumption from the baseline using the Calorific value from biomass (wood chip).
Any comment:	-

Data / Parameter:	**SFC**
Data unit:	tonnes of residual fuel oil/MWh_{th}
Description:	Specific fuel oil consumption per unit of the thermal energy generated
Source of data used:	Project developer
Value applied:	64.51
Justification of the choice of data or description of measurement methods and procedures actually applied :	Value reached from the monitoring of fuel oil energy consumption from the baseline.
Any comment:	-

B.6.3 Ex-ante calculation of emission reductions:

>>

1. Baseline emissions

$$BE_{thermal,CO2,y} = \left(\frac{EG_{thermal,y} \times EF_{FF,CO2}}{\eta_{thermal,B}} \right) + \left(\frac{HG_{thermal,y} \times EF_{FF,CO2}}{\eta_{thermal,H}} \right)$$

Where:

$BE_{thermal,CO2,y}$ the baseline emissions from steam/heat displaced by the project activity during the year y tCO_2e.

$EG_{thermal,y}$ net quantity of steam supplied by the boilers during the year y, TJ.

$HG_{thermal,y}$ net quantity of steam supplied by the thermal fluid heater during the year y in TJ.

$EF_{FF, CO2}$ the CO_2 emission factor of the fuel that would have been used in the baseline plant (tCO_2/TJ), obtained from reliable local or national data if available, otherwise, IPCC default emission factors are used.

$\eta_{thermal,\,B}$ Efficiency of the boiler using fossil fuel that would have been used in the absence of the project activity.

$\eta_{thermal,H}$ Efficiency of the thermal fluid heater using fossil fuel that would have been used in the absence of the project activity.

Where:

$EG_{thermal,y}$ = net quantity of steam supplied by the boilers during the year y in TJ.

$EG_{thermal,y}$ = tons of steam generated per year x heat content in the steam in TJ/tonnes.
$EG_{thermal,y}$ = 164,160 x 2.6725
$EG_{thermal,y}$ = 438.72 TJ

$HG_{thermal,y}$ = net quantity of steam supplied by the thermal fluid heater during the year y in TJ.

$HG_{thermal,y}$ = thermal fluid heater capacity (in Mcal/h) x Hour per year (h/year)
$HG_{thermal,y}$ = 4,000 x 8,640 = 43,200,000 Mcal or
$HG_{thermal,y}$ = 172.26 TJ

The calculation due to the baseline emissions from steam/heat displaced by the project activity during the year y in tCO_2e is:

$$BE_{thermal,CO2,y} = \left(\frac{EG_{thermal,y} \times EF_{FF,CO2}}{\eta_{thermal,B}}\right) + \left(\frac{HG_{thermal,y} \times EF_{FF,CO2}}{\eta_{thermal,H}}\right)$$

$$BE = \left(\frac{438.72 \times 77.4}{0.87}\right) + \left(\frac{172.26 \times 77.4}{0.84}\right)$$

BE = 52,363 tCO_2/year

2. Project emissions

PE = 0 boiler and thermal unit may still be used occasionally in project scenario "for stand-by and maintenance purposes.

3. Leakage

$$L_y = PE_{ya} = N_y \times AVDB_{yp} \times EF_{km,CO2,y}$$

Where:

$PE_{y\,a}$ Project emissions (tCO_2e) in monitoring period;

N_{yp} Number of truck trips during the monitoring period[19];

$AVDB_{yp}$ Average round trip distance (from and to) between the biomass supply sites and the site of the project plant during the monitoring period (km);

$EF_{km,\,CO2,y}$ Average CO_2 emission factor for the trucks (tCO_2/km)[20]. (Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories: Reference Manual, Moderate Control index for US

[19] Truck trips are calculated to biomass truck trips.

Heavy Duty Diesel Vehicles in Table 1-32, p. 1.75. (1011 gCO2/km or 0.001011 tCO2/km) Anexx 01n.

Ly = 0 This leakage source attributed to transportation shall be considered, otherwise it can be neglected.

4. Emission reduction

$$ER_y = BE_y - PE_y - L_y$$

ER_y = 52.363 tCO_2/year

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

>>

Year	Estimation of project activity emission (tonnes of CO_2e)	Estimation of baseline emission (tonnes of CO_2e)	Estimation of leakage (tonnes of CO_2e)	Estimation of overall emission reductions (tonnes of CO_2e)
September 1, 2006	0	17,454	0	13,010
2007	0	52,363	0	52,363
2008	0	52,363	0	52,363
2009	0	52,363	0	52,363
2010	0	52,363	0	52,363
2011	0	52,363	0	52,363
2012	0	52,363	0	52,363
August 31, 2013	0	34,908	0	34,908
Total (tCO_2e)	0	**362,096**	0	**362,096**

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

B.7.1 Data and parameters monitored:

Data / Parameter:	**Biomass Consumption**
Data unit:	m^3.
Description:	The quantity of biomass burnt in biomass boiler and thermal fluid heater at project site.
Source of data to be used:	On-site measurements.
Value of data	To be registered.
Description of measurement methods and procedures to be applied:	Verification of purchase receipts with the quantity of biomass consumed at AMC Têxtil Ltda. The data will be registered in the electronic spreadsheet denominated "Formulário de Registro de Monitoramento e Medição da Matriz Energética - Biomassa".
QA/QC procedures to be applied:	Cross-check of cubage (cubic capacity – width x height x length) of each truck after remove the biomass to storage area.

[20] this value was used according to the IPCC: http://www.ipcc-nggip.iges.or.jp/public/gl/invs6a.html - pages 61-80

or http://www.ipcc-nggip.iges.or.jp/public/gl/guidelin/ch1ref4.pdf

	If there is any difference between purchase receipts and cubage, the purchase receipts will be used.
Any comment:	Data archived: Crediting period + 2 yrs

Data / Parameter:	$EG_{thermal,y}$
Data unit:	TJ.
Description:	the net quantity of steam/heat supplied by boilers during the year y.
Source of data to be used:	On-site measurements.
Value of data	To be registered.
Description of measurement methods and procedures to be applied:	The net quantity of steam will be monitored by flow using meters and daily registered in electronic spreadsheet. The flow rate will be monitored continuously.
QA/QC procedures to be applied:	Cross-check biomass consumed with steam production.
Any comment:	The water flow (m^3/h) in boiler will be monitored and correlated with steam flow. This verification can be characterized as one more cross-check, but only in operational emergencies (maintenance or special incidents). The pressure of the boiler is about 8 bar.

Data / Parameter:	$HG_{thermal,y}$
Data unit:	TJ.
Description:	the net quantity of heat supplied by the thermal fluid heater during the year y.
Source of data to be used:	On-site measurements.
Value of data	To be registered.
Description of measurement methods and procedures to be applied:	The quantity of heat of the thermal fluid heater will be monitored by fluid flow (Therminol TX [21]). The data will be registered in the electronic spreadsheet.
QA/QC procedures to be applied:	Cross-check biomass consumed with steam production.
Any comment:	The pressure of the thermal fluid heater is about 0.5 bar.

Data / Parameter:	**Boiler temperature**
Data unit:	Celsius.
Description:	the average of daily boiler temperature.
Source of data to be used:	On-site measurements.
Value of data	To be registered.
Description of measurement methods and procedures to be applied:	The daily average of boiler temperature is registered in the spreadsheet. Monthly and then annually the mean of daily records is calculated and registered in the same sheet.
QA/QC procedures to be applied:	-

[21] www.therminol.com

Any comment:	The data will be to calculate the enthalpy

Data / Parameter:	**Thermal fluid heater temperature**
Data unit:	Celsius
Description:	The average of daily thermal fluid heater temperature.
Source of data to be used:	On-site measurements.
Value of data	To be registered.
Description of measurement methods and procedures to be applied:	The daily average of thermal fluid heater temperature is registered in the spreadsheet. Three times a day the input and output temperature of the fluid are monitored and its registered monthly in electronic spreadsheet.
QA/QC procedures to be applied:	-
Any comment:	The data will be to calculate the enthalpy

Data / Parameter:	**Residual fuel oil (BPF 1A or RFO or Shale Oil)**
Data unit:	Tonnes
Description:	Monitoring by the Project Developer
Source of data used:	-
Value applied:	The fuel oil consumption in the boiler will be monitored by stock control.
Justification of the choice of data or description of measurement methods and procedures actually applied :	Fuel oil consumption will be checked with purchase invoices on a periodic basis.
Any comment:	There is no intention to burn residual fuel oil in the project activity. However, the old fuel oil equipments (boilers and thermal fluid heaters) will be kept as backup and their use of fuel oil will be monitored as stated above.

Data / Parameter:	NB_{yp}
Data unit:	Unit
Description:	Number of truck trips during the month
Source of data used:	-
Justification of the choice of data or description of measurement methods and procedures actually applied :	The data has been determined by biomass purchase receipts. These trips were counted through the invoices purchase and the evidence was shown to DOE in verification visit. (Annex 1e).
Any comment:	Biomass (truck trips)

Data / Parameter:	$AVDB_{yp}$
Data unit:	Km
Description:	Average round trip distance (from and to) between the biomass residue fuel supply sites and the site of the project plant during the month
Source of data used:	-
Justification of the choice of data or	The average distance has been measured between the biomass supplies and the site of the project plant. The average was calculated from the biomass

description of measurement methods and procedures actually applied :	supplier farthest. Look the Annex 1i.
Any comment:	Biomass (truck trips)

B.7.2 Description of the monitoring plan:

>>

The data to be monitored during project's crediting period is quantity of biomass burned in the biomass boiler and biomass thermal fluid heater, the steam/heat produced, water input and steam out temperature in boiler and input and output temperature of fluid in the biomass thermal fluid heater. All monitoring data will be electronically kept in Malhas Menegotti system for two years after the end of crediting period.

Biomass consumption and supply control: each truck is inspected in the reception desk at Malhas Menegotti through the purchase receipts. In the storage area, the quantity of biomass is checked of cubage process (width x height x length). The quantity of biomass in storage area is calculated every time that biomass is discharge. This data is registered daily in "Formulário de Registro de Monitoramento e Medição da Matriz Energética - Biomassa" form. If there is any difference between purchase receipts and cubage, the purchase receipts will be used.

Steam production control: The amount of steam is monitored by steam outflow and its energy content calculated by the enthalpy of the steam. This enthalpy is determined based on the mass flow (ts/h) and input and output temperature (°C) in boiler. The pressure of the boiler is about 8 bar.

Water flow control: The water flow in boiler will be correlated with steam flow and in the operational emergencies (maintenance or special incidents) this values will be use to monitored steam flow. The pressure of the boiler is about 8 bar.

Boiler temperature: The daily average of biomass boiler temperature is registered in the electronic spreadsheet.

Thermal fluid heater temperature: The daily average of biomass thermal fluid heater temperature is registered in the electronic spreadsheet.

Residual fuel oil: The use of residual fuel oil (BPF 1A or RFO or Shale Oil) will be monitored by stock control, cross-checking with receipts.

Monitoring plan management responsibilities are described as follows:
Production Manager (PM) – Responsible to organize monitoring data and undertake periodic internal audits in project´s operations to check if operator of boilers and thermal fluid heaters are following the monitoring plan and if any corrective actions are required. Technician service team will control biomass, steam production, daily average temperature. This manager is also responsible for boilers' emissions monitoring, operation, maintenance, calibration, training crew and for the final disposal of residues generated by the boilers and thermal fluid heaters.

The calibration instruments make part of a environmental management system (EMS), which all measuring and safety equipments are predicted at Calibration Instruments Plan, according manufacturer.

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

>>
Date of completing the final draft of the baseline section & monitoring methodology:
November 21, 2007.

Name of person / entity determining the baseline:
Engineer Master Science (MSc.) Marcos Eduardo Gomes Cunha / Ciclo Ambiental Engenharia Ltda.
Rua Clovis Bevilacqua, 243/24 – Guanabara - Campinas – SP – CEP 13.073-021.
Email: marcos@cicloambiental.eng.br

Malhas Menegotti (company) is the main Project Participant as indicated in the Annex 1. Marcos Eduardo Gomes Cunha is a consultant from Ciclo Ambiental who is responsible for the technical development of this document and for all the issues related to this project.

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:

>>
The starting date of the project is September 1, 2006. The main equipment (new boiler) was acquired by Malhas Menegotti on July 24, 2006.

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

>>
21y-0m

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:

>>
September 1, 2006. Starter of reductions: when the biomass boiler begins to be operated.

C.2.2.2. Length:

>>
7 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:

>>

Menegotti Project complies with the environmental regulations of the country. The plant has the required environmental license issued by the State environmental agency, FATMA (Fundação do Meio Ambiente), LO n° 9539/2011, issued in December, 23 2011, valid until December, 23, 2015, according figure below.

ESTADO DE SANTA CATARINA
SECRETARIA DE ESTADO DO DESENVOLVIMENTO SUSTENTÁVEL
FUNDAÇÃO DO MEIO AMBIENTE

LICENÇA AMBIENTAL DE OPERAÇÃO

FATMA

133.713
Selo de Autenticidade

Nº 9539/2011

A **Fundação do Meio Ambiente - FATMA**, no uso de suas atribuições que lhe são conferidas pelo inciso I do artigo 7° da Lei Estadual N° 14.675 de 2009, com base no processo de licenciamento ambiental n° IND/00137/CRN e **parecer técnico n° 375/2011/CRN**, concede a presente **LICENCA AMBIENTAL DE OPERAÇÃO** à:

Empreendedor

NOME: MALHAS MENEGOTTI INDUSTRIAL TEXTIL LTDA
ENDEREÇO: JOAQUIM FRANCISCO DE PAULA, 4850, CHICO DE PAULA
CEP: 89.254-710 MUNICÍPIO: JARAGUÁ DO SUL ESTADO: SC
CPF/CNPJ: 10.474.553/0001-30

Para Atividade de

ATIVIDADE: 24.70.00 - FABRICAÇÃO DE ARTEFATOS TÊXTEIS, COM ESTAMPARIA E/OU TINTURA
EMPREENDIMENTO: MALHAS MENEGOTTI INDÚSTRIA TÊXTIL LTDA

Localizada em

ENDEREÇO: RUA: JOAQUIM FRANCISCO DE PAULA, 4850, CHICO DE PAULA
CEP: 89.250-000 MUNICÍPIO: JARAGUÁ DO SUL ESTADO: SC
COORDENADA PLANA: UTM X 684989 - UTM Y 7069612 null

Da operação

A presente Licença, concebida com base nas informações apresentadas pelo interessado, declara a **viabilidade de operação** do empreendimento, equipamento ou atividade, quanto aos aspectos ambientais, e não dispensa nem substitui alvarás ou certidões de qualquer natureza, exigidas pela Legislação Federal, Estadual ou Municipal.

Condições gerais

I. Quaisquer alterações nas especificações dos elementos apresentados no procedimento de licenciamento ambiental deverão ser precedidas de anuência da FATMA.
II. A FATMA, mediante decisão motivada, poderá modificar as condições de validade, suspender ou cancelar a presente licença, caso ocorra:
- Omissão ou falsa descrição de informações que subsidiaram a expedição da presente licença;
- A superveniência de graves riscos ambientais e/ou de saúde pública;
- Violação ou inadequação de quaisquer condições de validade da licença ou normas legais.

III. A publicidade desta licença deve ocorrer conforme Lei Estadual 14.675/09, artigo 42.

Prazo de validade

(48) meses, a contar da presente data.

Data, local e assinatura

FLORIANÓPOLIS 23, 12, 2011

Murilo Xavier Flores
Presidente
394.121-9

TABELIONATO DE NOTAS E PROTESTO DE TITULOS DE JARAGUÁ DO SUL
CARLOS FABRICIO GRIESBACH - TABELIÃO

AUTENTICAÇÃO

Autentico a presente cópia por ser uma reprodução fiel do documento que me foi apresentado

Jaraguá do Sul-SC,06/01/2012
ALZIRA DOS SANTOS
ESCREVENTE
Selo Digital de Fiscalização: COI08987-GG7M NORMAL

ADP-01746

Figure 7 - Operation license at Menegotti Project

This project activity presents no major environmental impacts and does not request an Environmental Impact Assessment.

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:

>>

The atmospheric emissions of the equipments were monitored and compared to the applicable law. The results evidenced a significant improvement, when compared to the utilization of fuel oil in the equipments. The results were compared to confirm the improvement in air condition of the project.

SECTION E. Stakeholders' comments

>>

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

>>

The Brazilian Designated National Authority for the CDM, Comissão Interministerial de Mudanças Globais do Clima, requires the compulsory invitation of selected stakeholders to comment the PDD sent to validation in order to provide the letter of approval.

The Resolution determines that copies of the invitations for comments sent by the project proponents at least to the following agents involved in and affected by project activities:

- Municipal governments and City Councils;
- State and Municipal Environmental Agencies;
- Brazilian Forum of NGOs and Social Movements for Environment and Development;
- Community associations;
- State Attorney for the Public Interest;

Copies of the letters and post office confirmation of receipt communication are available upon request. No concerns were raised in the public calls regarding the project.

E.2. Summary of the comments received:

>>

No comment has been received so far.

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

>>

No comment has been received so far.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

1. Project Participant

Organization:	Malhas Menegotti Indústria Têxtil Ltda
Street/P.O.Box:	Rua Joaquim Francisco de Paulo, 4850 - B. Chico de Paula
Building:	Administrativo
City:	Jaraguá do Sul
State/Region:	Santa Catarina – SC
Postfix/ZIP:	89254-710
Country:	Brazil
Telephone:	+ 55 47 3372-8500
FAX:	+ 55 47 3372-8501
E-Mail:	reinaldo@menegotti.com.br
URL:	www.menegotti.com.br
Represented by:	
Title:	
Salutation:	Mr.
Last Name:	Steffens
Middle Name:	-
First Name:	Reinaldo
Department:	Diretoria
Mobile:	
Direct FAX:	
Direct tel:	+ 55 (47) 3372-8554
Personal E-Mail:	reinaldo@menegotti.com.br

2. Project Participant

Organization:	Ciclo Ambiental Engenharia Ltda.
Street/P.O.Box:	Rua Clovis Bevilacqua, 243/24 - Guanabara
Building:	
City:	Campinas.
State/Region:	São Paulo – SP.
Postfix/ZIP:	13.073-021
Country:	Brazil.
Phone:	+ 55 (19) 3258-6335
Fax/Phone:	+ 55 (19) 3579-8354
E-Mail:	
URL:	http://www.cicloambiental.eng.br/
Represented by:	
Title:	
Salutation:	Mr.
Last Name:	Cunha
Middle Name:	-
First Name:	Marcos
Department:	Diretoria
Mobile:	
Direct Fax:	
Direct tel:	+ 55 (19) 99773-3060.
Personal E-Mail:	marcos@cicloambiental.eng.br

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

There is no funding from Annex-I parties

Annex 3

BASELINE INFORMATION

As described in the item B.4, the proposed baseline is the GHG emissions that would have occurred due to use of residual fuel oil in the boilers and thermal fluid heater in absence of this project activity.

Baseline emissions due to burning of residual fuel oil BPF 1A in boilers and thermal fluid heater are calculated based on the steam/heat generated from burning of residual fuel oil BPF 1A. Total heat content of the steam generated in boilers and total heat supplied by the thermal fluid heater to the thermal fluid is taken into account for baseline calculations.

The baseline methodology is applied in the context of the project activity as follows:

For steam/heat produced using fossil fuels the baseline emissions are calculated as follows:

$$BE_{thermal,CO2,y} = \left(\frac{EG_{thermal,y} \times EF_{FF,CO2}}{\eta_{thermal,B}} \right) + \left(\frac{HG_{thermal,y} \times EF_{FF,CO2}}{\eta_{thermal,H}} \right)$$

Where:

$BE_{thermal,CO2,y}$	the baseline emissions from steam/heat displaced by the project activity during the year y tCO_2e.
$EG_{thermal,y}$	net quantity of steam supplied by the boilers during the year y, TJ.
$HG_{thermal,y}$	net quantity of steam supplied by the thermal fluid heater during the year y in TJ.
$EF_{FF, CO2}$	the CO_2 emission factor of the fuel that would have been used in the baseline plant (tCO_2/TJ), obtained from reliable local or national data if available, otherwise, IPCC default emission factors are used.
$\eta_{thermal, B}$	Efficiency of the boiler using fossil fuel that would have been used in the absence of the project activity.
$\eta_{thermal,H}$	Efficiency of the thermal fluid heater using fossil fuel that would have been used in the absence of the project activity.

Where:

$EG_{thermal,y}$ = net quantity of steam supplied by the boilers during the year y in TJ.

$EG_{thermal,y}$ = tons of steam generated per year x heat content in the steam in TJ/tonnes.
$EG_{thermal,y}$ = 164,160 x 2.6725
$EG_{thermal,y}$ = 438.72 TJ

$HG_{thermal,y}$ = net quantity of steam supplied by the thermal fluid heater during the year y in TJ.

$HG_{thermal,y}$ = thermal fluid heater capacity (in Mcal/h) x Hour per year (h/year)
$HG_{thermal,y}$ = 4,000 x 8,640 = 43,200,000 Mcal or
$HG_{thermal,y}$ = 172.26 TJ

The calculation due to the baseline emissions from steam/heat displaced by the project activity during the year y in tCO_2e is:

$$BE_{thermal,CO2,y} = \left(\frac{EG_{thermal,y} \times EF_{FF,CO2}}{\eta_{thermal,B}} \right) + \left(\frac{HG_{thermal,y} \times EF_{FF,CO2}}{\eta_{thermal,H}} \right)$$

$$BE = \left(\frac{438.72 \times 77.4}{0.87} \right) + \left(\frac{172.26 \times 77.4}{0.84} \right)$$

BE = 52,363 tCO_2/year

Annex 4

MONITORING INFORMATION

The data to be monitored during project's crediting period is quantity of biomass burned in the biomass boiler and biomass thermal fluid heater, the steam/heat produced, water input and steam out temperature in boiler and input and output temperature of fluid in the biomass thermal fluid heater. All monitoring data will be electronically kept in Malhas Menegotti system for two years after the end of crediting period.

Biomass consumption and supply control: each truck is inspected in the reception desk at Malhas Menegotti through the purchase receipts. In the storage area, the quantity of biomass is checked of cubage process (width x height x length). The quantity of biomass in storage area is calculated every time that biomass is discharge. This data is registered daily in "Formulário de Registro de Monitoramento e Medição da Matriz Energética - Biomassa" form. If there is any difference between purchase receipts and cubage, the purchase receipts will be used.

Steam production control: The amount of steam is monitored by steam outflow and its energy content calculated by the enthalpy of the steam. This enthalpy is determined based on the mass flow (ts/h) and input and output temperature (°C) in boiler. The pressure of the boiler is about 8 bar.

Water flow control: The water flow in boiler will be correlated with steam flow and in the operational emergencies (maintenance or special incidents) this values will be use to monitored steam flow. The pressure of the boiler is about 8 bar.

Boiler temperature: The daily average of biomass boiler temperature is registered in the electronic spreadsheet.

Thermal fluid heater temperature: The daily average of biomass thermal fluid heater temperature is registered in the electronic spreadsheet.

Residual fuel oil: The use of residual fuel oil will be monitored by stock control, cross-checking with receipts.

Monitoring plan management responsibilities are described as follows:
Production Manager (PM) – Responsible to organize monitoring data and undertake periodic internal audits in project´s operations to check if operator of boilers and thermal fluid heaters are following the monitoring plan and if any corrective actions are required. Technician service team will control biomass, steam production, daily average temperature. This manager is also responsible for boilers' emissions monitoring, operation, maintenance, calibration, training crew and for the final disposal of residues generated by the boilers and thermal fluid heaters.

The calibration instruments make part of a environmental management system (EMS), which all measuring and safety equipments are predicted at Calibration Instruments Plan, according manufacturer.

Annex 5

PROJECT EMISSIONS CALCULATION
(MONITORING PERIOD: SEP/2006 – DEZ/2007)

Fuel BPF Boiler and Heater.						
MONTH/YEAR	kg	Power Heat Inferior BPF e Xisto (kCal/kg)	Energy (kCal)	Energy (kJ)	TJ/month 1kJ = 10^-9 TJ	tonCO_2e/month 1TJ= 77,4tCO_2e
Sep – 06	414.800,00	9.900,00	4.106.520.000,00	17.193.177.936,00	17,19	1.583,94
Oct - 06	276.110,00	9.900,00	2.733.489.000,00	11.444.571.745,20	11,44	1.054,11
Nov - 06	277.810,00	9.900,00	2.750.319.000,00	11.515.035.589,20	11,52	1.061,49
Dec - 06	131.110,00	9.900,00	1.297.989.000,00	5.434.420.345,20	5,43	500,34
Jan - 07	9.520,00	9.900,00	94.248.000,00	394.597.526,40	0,39	35,94
Feb - 07	0,00	9.900,00	0,00	0,00	0,00	0,00
Mar - 07	0,00	9.900,00	0,00	0,00	0,00	0,00
Apr - 07	0,00	9.900,00	0,00	0,00	0,00	0,00
May - 07	0,00	9.900,00	0,00	0,00	0,00	0,00
Jun - 07	0,00	9.900,00	0,00	0,00	0,00	0,00
Jul - 07	0,00	9.900,00	0,00	0,00	0,00	0,00
Aug - 07	0,00	9.900,00	0,00	0,00	0,00	0,00
Sep - 07	0,00	9.900,00	0,00	0,00	0,00	0,00
Oct - 07	0,00	9.900,00	0,00	0,00	0,00	0,00
Nov - 07	0,00	9.900,00	0,00	0,00	0,00	0,00
Dec - 07	0,00	9.900,00	0,00	0,00	0,00	0,00
					TOTAL	4.236

Fuel Xisto Boiler and Heater.						
MONTH/YEAR	kg	Power Heat Inferior BPF e Xisto (kCal/kg)	Energy (kCal)	Energy (kJ)	TJ/month 1kJ = 10^-9 TJ	tonCO2e/month 1TJ= 77,4tCO2e
Sep – 06	0,00	9.900	0	0	0	0
Oct - 06	0,00	9.900	0	0	0	0
Nov - 06	0,00	9.900	0	0	0	0
Dec - 06	0,00	9.900	0	0	0	0
Jan - 07	0,00	9.900	0	0	0	0
Feb - 07	8.000,00	9.900	79.200.000	331.594.560	0	0
Mar - 07	0,00	9.900	0	0	0	0
Apr - 07	76.040,00	9.900	752.796.000	3.151.806.293	3	276
May - 07	254.690,00	9.900	2.521.431.000	10.556.727.311	11	1.014
Jun - 07	257.090,00	9.900	2.545.191.000	10.656.205.679	11	1.014
Jul - 07	139.300,00	9.900	1.379.070.000	5.773.890.276	6	553
Aug - 07	49.840,00	9.900	493.416.000	2.065.834.109	2	184
Sep - 07	25.310,00	9.900	250.569.000	1.049.082.289	1	92
Oct - 07	0,00	9.900	0	0	0	0
Nov - 07	0,00	9.900	0	0	0	0
Dec - 07	0,00	9.900	0	0	0	0
					TOTAL	3.133

	BPF	XISTO
2006	4.199,88	0
2007	35,94	3.133,00
Total 16 months	460,55	
Project Emissions (tCO2e)		
2006 *(4 months)*	1842,205	
2007	5526,615	
2008	5526,615	
2009	5526,615	
2010	5526,615	
2011	5526,615	
2012	5526,615	
2013 *(8 months)*	3684,41	
Total	38686,305	
Total/year	**5526,615**	

Annex 6

IRR AND NPV CALCULATION

WOOD CHIP	O&M (montlhy) WOOD CHIP	R$ 34,000.00
	PRICE (R$/M3)	R$ 32.00
	QUANTITY (M3) per month	18,000
OIL	O&M (montlhy) OIL	R$ 23,000.00
	PRICE (R$/kg)	R$ 0.7206
	QUANTITY (kg) per month	800,000
	ANNUAL INFLATION - IPCA	5%

		2007	2008	2009	2010	2011	2012
OIL	O&M (R$ 23.000/m) + IPCA annual	R$ 276,000.00	R$ 289,800.00	R$ 304,290.00	R$ 319,504.50	R$ 335,479.73	R$ 352,253.71
	FUEL. (800.000Kg/m x R$ 0,7206/Kg)	R$ 6,917,760.00	R$ 6,917,760.00	R$ 6,917,760.00	R$ 6,917,760.00	R$ 6,917,760.00	R$ 6,917,760.00
	Sub total (I)	R$ 7,193,760.00	R$ 7,207,560.00	R$ 7,222,050.00	R$ 7,237,264.50	R$ 7,253,239.73	R$ 7,270,013.71
WOOD CHIP	O&M (R$ 34.000/m) + IPCA annual	R$ 408,000.00	R$ 428,400.00	R$ 449,820.00	R$ 472,311.00	R$ 495,926.55	R$ 520,722.88
	FUEL (18.000 m3/m x R$ 32/m3)	R$ 6,912,000.00	R$ 6,912,000.00	R$ 6,912,000.00	R$ 6,912,000.00	R$ 6,912,000.00	R$ 6,912,000.00
	Sub total (II)	R$ 7,320,000.00	R$ 7,340,400.00	R$ 7,361,820.00	R$ 7,384,311.00	R$ 7,407,926.55	R$ 7,432,722.88
	Operational results (I-II)	(R$ 126,240.00)	(R$ 132,840.00)	(R$ 139,770.00)	(R$ 147,046.50)	(R$ 154,686.83)	(R$ 162,709.17)
	Depreciation	(R$ 126,600.00)	(R$ 126,600.00)	(R$ 126,600.00)	(R$ 126,600.00)	(R$ 126,600.00)	(R$ 126,600.00)
	Taxable income	(R$ 252,840.00)	(R$ 259,440.00)	(R$ 266,370.00)	(R$ 273,646.50)	(R$ 281,286.83)	(R$ 289,309.17)
	Income tax (34%)	R$ 0.00	R$ 0.00	R$ 0.00	R$ 0.00	R$ 0.00	R$ 0.00
	Results (after income tax)	(R$ 126,240.00)	(R$ 132,840.00)	(R$ 139,770.00)	(R$ 147,046.50)	(R$ 154,686.83)	(R$ 162,709.17)

		2013	2014	2015	2016	2017	2018
OIL	O&M (R$ 23.000/m) + IPCA annual	R$ 369,866.40	R$ 388,359.72	R$ 407,777.70	R$ 428,166.59	R$ 449,574.92	R$ 472,053.66
	FUEL. (800.000Kg/m x R$ 0,7206/Kg)	R$ 6,917,760.00	R$ 6,917,760.00	R$ 6,917,760.00	R$ 6,917,760.00	R$ 6,917,760.00	R$ 6,917,760.00
	Sub total (I)	R$ 7,287,626.40	R$ 7,306,119.72	R$ 7,325,537.70	R$ 7,345,926.59	R$ 7,367,334.92	R$ 7,389,813.66
WOOD CHIP	O&M (R$ 34.000/m) + IPCA annual	R$ 546,759.02	R$ 574,096.97	R$ 602,801.82	R$ 632,941.91	R$ 664,589.01	R$ 697,818.46
	FUEL (18.000 m3/m x R$ 32/m3)	R$ 6,912,000.00	R$ 6,912,000.00	R$ 6,912,000.00	R$ 6,912,000.00	R$ 6,912,000.00	R$ 6,912,000.00
	Sub total (II)	R$ 7,458,759.02	R$ 7,486,096.97	R$ 7,514,801.82	R$ 7,544,941.91	R$ 7,576,589.01	R$ 7,609,818.46
	Operational results (I-II)	(R$ 171,132.62)	(R$ 179,977.26)	(R$ 189,264.12)	(R$ 199,015.32)	(R$ 209,254.09)	(R$ 220,004.80)
	Depreciation	(R$ 126,600.00)	(R$ 126,600.00)	(R$ 126,600.00)	(R$ 126,600.00)	(R$ 126,600.00)	(R$ 126,600.00)
	Taxable income	(R$ 297,732.62)	(R$ 306,577.26)	(R$ 315,864.12)	(R$ 325,615.32)	(R$ 335,854.09)	(R$ 346,604.80)
	Income tax (34%)	R$ 0.00	R$ 0.00	R$ 0.00	R$ 0.00	R$ 0.00	R$ 0.00
	Results (after income tax)	(R$ 171,132.62)	(R$ 179,977.26)	(R$ 189,264.12)	(R$ 199,015.32)	(R$ 209,254.09)	(R$ 220,004.80)

		2019	2020	2021	2022	2023	2024
OIL	O&M (R$ 23.000/m) + IPCA annual	R$ 495,656.35	R$ 520,439.16	R$ 546,461.12	R$ 573,784.18	R$ 602,473.39	R$ 632,597.06
	FUEL. (800.000Kg/m x R$ 0,7206/Kg)	R$ 6,917,760.00	R$ 6,917,760.00	R$ 6,917,760.00	R$ 6,917,760.00	R$ 6,917,760.00	R$ 6,917,760.00
	Sub total (I)	R$ 7,413,416.35	R$ 7,438,199.16	R$ 7,464,221.12	R$ 7,491,544.18	R$ 7,520,233.39	R$ 7,550,357.06
WOOD CHIP	O&M (R$ 34.000/m) + IPCA annual	R$ 732,709.38	R$ 769,344.85	R$ 807,812.09	R$ 848,202.70	R$ 890,612.83	R$ 935,143.47
	FUEL (18.000 m3/m x R$ 32/m3)	R$ 6,912,000.00	R$ 6,912,000.00	R$ 6,912,000.00	R$ 6,912,000.00	R$ 6,912,000.00	R$ 6,912,000.00
	Sub total (II)	R$ 7,644,709.38	R$ 7,681,344.85	R$ 7,719,812.09	R$ 7,760,202.70	R$ 7,802,612.83	R$ 7,847,143.47
	Operational results (I-II)	(R$ 231,293.04)	(R$ 243,145.69)	(R$ 255,590.97)	(R$ 268,658.52)	(R$ 282,379.45)	(R$ 296,786.42)
	Depreciation	(R$ 126,600.00)	(R$ 126,600.00)	(R$ 126,600.00)	(R$ 126,600.00)	(R$ 126,600.00)	(R$ 126,600.00)
	Taxable income	(R$ 357,893.04)	(R$ 369,745.69)	(R$ 382,190.97)	(R$ 395,258.52)	(R$ 408,979.45)	(R$ 423,386.42)
	Income tax (34%)	R$ 0.00	R$ 0.00	R$ 0.00	R$ 0.00	R$ 0.00	R$ 0.00
	Results (after income tax)	(R$ 231,293.04)	(R$ 243,145.69)	(R$ 255,590.97)	(R$ 268,658.52)	(R$ 282,379.45)	(R$ 296,786.42)

		2025	2026	2027	2028	2029	2030	2031
OIL	O&M (R$ 23.000/m) + IPCA annual	R$ 664,226.91	R$ 697,438.25	R$ 732,310.17	R$ 768,925.67	R$ 807,371.96	R$ 847,740.56	R$ 890,127.58
	FUEL. (800.000Kg/m x R$ 0,7206/Kg)	R$ 6,917,760.00	R$ 6,917,760.00	R$ 6,917,760.00	R$ 6,917,760.00	R$ 6,917,760.00	R$ 6,917,760.00	R$ 6,917,760.00
	Sub total (I)	R$ 7,581,986.91	R$ 7,615,198.25	R$ 7,650,070.17	R$ 7,686,685.67	R$ 7,725,131.96	R$ 7,765,500.56	R$ 7,807,887.58
WOOD CHIP	O&M (R$ 34.000/m) + IPCA annual	R$ 981,900.65	R$ 1,030,995.68	R$ 1,082,545.46	R$ 1,136,672.74	R$ 1,193,506.37	R$ 1,253,181.69	R$ 1,315,840.78
	FUEL (18.000 m3/m x R$ 32/m3)	R$ 6,912,000.00	R$ 6,912,000.00	R$ 6,912,000.00	R$ 6,912,000.00	R$ 6,912,000.00	R$ 6,912,000.00	R$ 6,912,000.00
	Sub total (II)	R$ 7,893,900.65	R$ 7,942,995.68	R$ 7,994,545.46	R$ 8,048,672.74	R$ 8,105,506.37	R$ 8,165,181.69	R$ 8,227,840.78
	Operational results (I-II)	(R$ 311,913.74)	(R$ 327,797.43)	(R$ 344,475.30)	(R$ 361,987.06)	(R$ 380,374.42)	(R$ 399,681.14)	(R$ 419,953.19)
	Depreciation	(R$ 126,600.00)	(R$ 126,600.00)	(R$ 126,600.00)	(R$ 126,600.00)	(R$ 126,600.00)	(R$ 126,600.00)	(R$ 126,600.00)
	Taxable income	(R$ 438,513.74)	(R$ 454,397.43)	(R$ 471,075.30)	(R$ 488,587.06)	(R$ 506,974.42)	(R$ 526,281.14)	(R$ 546,553.19)
	Income tax (34%)	R$ 0.00	R$ 0.00	R$ 0.00	R$ 0.00	R$ 0.00	R$ 0.00	R$ 0.00
	Results (after income tax)	(R$ 311,913.74)	(R$ 327,797.43)	(R$ 344,475.30)	(R$ 361,987.06)	(R$ 380,374.42)	(R$ 399,681.14)	(R$ 419,953.19)

Investment	December-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
	-3,165,000.00	-126,240.00	-132,840.00	-139,770.00	-147,046.50	-154,686.83	-162,709.17	-171,132.62	-179,977.26	-189,264.12	-199,015.32	-209,254.09	-220,004.80	-231,293.04

2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
-243,145.69	-255,590.97	-268,658.52	-282,379.45	-296,786.42	-311,913.74	-327,797.43	-344,475.30	-361,987.06	-380,374.42	-399,681.14	-419,953.19

PROJECT LIFETIME
25 YEARS

#DIV/0!	IIR
(R$ 3,990,794.51)	NPV

Annex 7

TIMELINE OF THE PROJECT ACTIVITY

Date	Documents	Comments	File
January 16, 2006	1) Meeting report 2) Cash flow on making-decision	Analysis and approval of the CDM fuel switching project based on CDM revenue.	00_TomadaDeDecisão.
April 12, 2006	1)Email from SENAI – 12/04/2006. 2) SENAI's proposal	SENAI's proposal – SC state – Blumenau city – SENAI's technical and technology services proposal for Environmental Management System (EMS), including CDM fuel switching project.	01_ SENAI - Proposta Assessoria SGA - Para desenvolver os novos objetivos e metas (caldeira foi escrito como energia)
June 26, 2006	1) SENAI's activity meeting report	SENAI's activity report from Blumenau city. SENAI's technical and technology services proposal for Environmental Management System (EMS), including CDM fuel switching project to meet the requirements of the program.	02_RelatoriodeAtividades_26.06.06
August 03, 2006	1) Email from SENAI – 03/08/2006.	Answer from Núcleo Ambiental – SENAI – SC – Blumenau to email sent by e-mail from Menegotti's EMS to Josiane and Flavio.	03_ Fw_Consulta MDL
August 14, 2006	1) E-mail from SENAI – 14/08/2006.	Answer from Núcleo Ambiental - SENAI – SC – Blumenau for e-mail by Menegotti's EMS to Josiane.	04_ Consulta MDL
August 16, 2006	1) Letter from SENAI – 16/08/2006.	Letter from Núcleo Ambiental SENAI – SC – Blumenau to Menegotti's Operational director to support CDM project.	05_NF SENAI
August 23, 2006	1) Email from EMS of the AMC.	EMS answers of Menegotti about CDM consulting focusing to meet the atmosphere emission in biomass	06_ MDL

		and oil boilers.	
December 05, 2006	1) Activity report from SENAI - SC. 05/12/2006.	Activity report from SENAI – SC – Blumenau encouraging Menegotti Board to develop the CDM Project.	07_RelatoriodeAtividades_05.12.06
December 06, 2006	1) E-mail about CDM project 06/12/2006.	Email from Josiane (EMS employee of Menegotti) to Operation Director (Mr. Reinaldo Steffens)	08_Projeto de MDL - Créditos de Carbono_
February 06, 2007	1) E-mail about CDM project 06/02/2007.	Operation director answer from Menegotti to Josiane focusing other companies located in São Paulo state to develop the CDM project.	09_Projeto MDL
February 27, 2007	1) E-mail about CDM project 27/02/2007.	Josiane's ask to CETESB – SP about Carbon credit project.	10_Projeto de MDL
April 03, 2007	1) E-mail about CDM project 03/04/2007.	CETESB's answer to Menegotti about credit carbon consulting companies.	11_[Fwd_ Re_ ___SPAM___ Projeto de MDL]
April 04, 2007	1) E-mail about CDM project 12/04/2007.	Josiane ask to the Ciclo AMBIENTAL about carbon credit.	12_Projeto MDL3
May 14, 2007	1) E-mail about CDM project 14/05/2007.	Answer of the CICLO AMBIENTAL to Menegotti about CDM project.	13_ Re: Projeto MDL3
June 11, 2007	1) E-mail about CDM issue 11/06/2007.	Joelcio´s answer about the indication of consulting of White Martins about the Carbon's Credit (Prof. Marcos Eduardo Gomes Cunha – Manager of CICLO AMBIENTAL).	14_E-mail – Menegotti.
June 12, 2007	1) E-mail about CDM issue 12/06/2007.	Joelcio´s answer to the consulting about the White Martins of Carbon's Credit (Prof. Marcos Eduardo Gomes Cunha – Manager of CICLO AMBIENTAL) and it sent the preliminary checklist to develop the project.	15_E-mail – Menegotti e Créditos de Carbono – Menegotti.

June 14, 2007	1) E-mail about CDM issue on 14/06/2007.	Waldecir´s answer from Malhas Menegotti to the preliminary checklist from Praxair.	16_E-mail – (CORREÇÃO) Créditos de Carbono.
July 16, 2007	1) Contract sign "Memorandum of understanding" (MoU)	Sign of MoU between CICLO AMBIENTAL and Malhas Menegotti looking for Development of Carbon´s Credit of Project.	Evidences sent to SGS.
October 10, 2007	1) Contract sign "Rendering of services"	Contract sign for rendering of services on validation project between Malhas Menegotti focusing on Carbon credit projects.	Evidences sent to SGS.
January 10, 2008	1) Contract sign "Rendering of services	Contract sign for Rendering of services on validation of projects in Climate Changes between SGS and Malhas Menegotti.	SGS found out In validation process
February 20, 2008	1) PDD Validation Report from SGS	First report – technical visit looking for the validation of PDD from project Malhas Menegotti.	SGS found out In validation process
March 27, 2008	1) SGS office meeting to send the evidences and answer of Report.	Answer of CICLO AMBIENTAL and it sent to all evidences requested by SGS.	SGS found out In validation process
August 26, 2008	1) E-mail with report's sent.	Second report – Evidence sent to SGS on 27/03/2008 about CDM Project.	SGS found out In validation process