Dori Alimentos LTDA.

Biomass based project - Brazil

MONITORING REPORT
Version 02

Monitoring period April 01st, 2006 to October 31st, 2008

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SECTION A. General description of small-scale project activity

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

Dori Alimentos LTDA. - Biomass based project - Brazil

Monitoring report completed in 27/10/2009 – Version 02

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

The project activity is a grouped project of two unities of *Dori Alimentos LTDA* and consists in promoting the fuel switch in *Dori's* boiler. *Dori Alimentos LTDA* is a candy industry that was created in 1967 as an individual company called Doraci dos Santos Spila, but only came out of the ground in around the decade of 1990, already with the currently name and the new owners, the Barion family, with the acquisition of one of the most traditional candy factory in the State of *Paraná*, the "*Ouro Verde*", situated in *Rolândia – PR* and the creation of commercial subsidiary companies in *Osasco – SP* and *Porto Alegre – RS*. Nowadays, the *Dori Alimentos LTDA* has two production unities, the company's head office is situated in the city of *Marília – SP* and the subsidiary production plant is located in the city of *Rolândia – PR*.

At the present time, *Dori* manufactures all kinds of candies, chocolates and peanuts in different flavours, to meet domestic and international demand. The company exports its products to 70 different countries

In the candies manufacturing process, the steam is used in several different stages of the production process, for example in the greenhouse providing heat to dry the final product or during the production in order to increase the humidity of some candies' ingredients.

The project activity aims to use, in both unities, eucalyptus and pinus wood chips, in *Dori's* head office it will be also used peanut shells, to supply steam to the production process to replace the usual shale oil, which is the fuel commonly used. In both unities, the fuel switch started in November 2004 but the project developer of *Dori's* head office started the operation of the biomass based boiler without production damages only on August 01, 2005 and the project developer of *Dori's* subsidiary company on January 01, 2005. At the present time, the fuel switch has already been accomplished and the boilers are working only with renewable biomass to generate steam: Dori's Head Office (*Marília*) since November 2008 and Dori's Subsidiary (*Rolândia*) since July 2008. The unusual consume of shale oil identified in both units are related to the period of equipment maintenance or cleaning, which last usually 2 or 3 hours, so that the amount of shale oil consumed is non-significant.

The project activity takes into account GHG emission mitigation due to the replacement of shale oil to generate heat with biomass residues with carbon-neutral cycle. In the absence of the project, the average amount of shale oil utilized in *Dori's* head office would be around 3,544 tonnes/year, which has been gradually replaced by renewable biomass to generate an average of 47,843 tonnes/year of steam in the boiler. In *Dori's* subsidiary company, the amount of shale oil that would be utilized is around 4,077 tonnes/year generating 55,041 tonnes/year of steam to be used throughout the production process.

The implementation of this project activity in *Dori Alimentos* has as objective stop using the shale oil and completely substitutes it by renewable biomasses to feed boiler and generate steam to sustain the production, with the intention of minimizing environmental impacts related to its consumption including the reduction of greenhouse gas (GHG) emissions.

A.3. Current status of the project activity:

The project description document was validated by the Designated Operational Entity TÜV NORD Cert GmbH and this present monitoring report will be verified by the same DOE.

The monitoring data was kept according to monitoring plan described in the project description document. The project activity employs wood chips (in the head office and in the subsidiary company) and peanut shells (only in *Dori*'s head office). The emission reductions due to the switching non renewable fuel (shale oil) to renewable biomass resulted in **51,254.00tCO_2e** during the monitoring period of 01/04/2006 to 31/10/2008.

The project proponent faced lots of barriers mainly throughout the adaptation period to the use of biomasses and to the new boiler. Besides, these new equipments acquired as well as the construction of sheds to stock the biomass, added an additional cost for the project proponent.

Moreover, although there is currently a great amount of these types of biomasses available regionally, a demand and price increase has already been reported. Even if the price of the biomasses increase, the project proponent cannot repass it through the production, once they would not have competitive prices in the market. The project approval will make the continue use of renewable biomasses feasible.

SECTION B. Application of monitoring methodology and results

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

- **Category Category AMS-I.C:** Thermal energy for the user with or without electricity – Version 13 from March 14th 2008.

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

B.2. Monitoring period

This report refers to the data registered during April 1st, 2006 to October 31st, 2008 (Days included).

B.3. Data and parameters applied:

Data / Parameter:	**EFshaleoil**
Data unit:	tCO_2/TJ
Description:	CO_2 Emission factor of shale oil
Source of data used:	Value checked at: -IPCC: Intergovernmental Panel on Climate Change http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_2_Ch2_Stationary_Combustion.pdf
Value applied:	73.3 tCO_2/TJ
Justification of the choice of data or description of measurement methods and procedures actually applied:	The use of this parameter is mandatory under the small scale methodology AMS.I-C chosen for this PDD and value applied is recommended to be imported from the IPCC.
Any comment:	-

Data / Parameter:	**$NCV_{shale\ oil}$**
Data unit:	TJ/tonne of shale oil
Description:	Net Calorific Value
Source of data used:	Value average checked at: - IPCC : Intergovernmental Panel on Climate Change http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_1_Ch1_Introduction.pdf
Value applied:	0.0381 TJ/Tonne
Justification of the choice of data or description of measurement methods	This value will provide the energy generated by the amount of shale oil that would be used in the absence of the project.

and procedures actually applied :	
Any comment:	IPCC default values shall be used only when country or project specific data are not available or difficult to obtain, according to "Guidance on IPCC default values" (Extract of the report of the twenty-fifth meeting of the Executive Board, paragraph 59).

Data / Parameter:	$\rho_{shale\ oil}$
Data unit:	ton/L
Description:	Specific gravity of the shale oil
Source of data used:	Value provided by the fuel provider through the technical form of the shale oil.
Value applied:	0.00097 ton/L
Justification of the choice of data or description of measurement methods and procedures actually applied :	The amount of oil used in the baseline was measured by volume units.
Any comment:	

Data / Parameter:	**ρrenbiomass**
Data unit:	ton/ m3
Description:	Specific gravity of renewable biomass
Source of data to be used:	Value measured and recorded by the project proponent.
Value of data applied for the purpose of calculating expected emission reductions	**Biomasses** / **Specific Gravity (tonnes/m³)**: **Wood chips** 0.35; **Peanut shells** 0.117
Description of measurement methods and procedures to be applied:	The value is referenced and was supplied by the project proponent
QA/QC procedures to be applied:	The specific gravity of the renewable biomass can be checked each time that a truck containing big bags with wood chips or peanut shells enters the project activity site through a weighing-machine. The values weighed, the truck capacity, the date and hour of the weighing and the truck plate are recorded and achieved. .
Any comment:	

Data / Parameter:	**Efficiency Factor**
Data unit:	Tons of shale oil / ton of steam
Description:	Efficiency of the boiler, used for determining the amount of shale oil consumed, based on the amount of steam generated.
Source of data to be used:	*Dori Alimentos LTDA.* 1/13.5 = 0.074074 13.5 is the average amount of steam generated (kg) for each kg of shale oil consumed. This value was determined by studies made

	through historical stem generation data, based on the functioning of the baseline boiler and the shale oil consumption registries.
Value of data	0.074
Justification of the choice of data or description of measurement methods and procedures actually applied :	Required to calculate the amount of shale oil generated by the amount of steam calculated with the steam flow meter.
Any comment:	

Data / Parameter:	**COEF i,y**
Data unit:	tCO2e/ ton fossil fuel
Description:	CO_2 emission coefficient of the shale oil
Source of data used:	Value calculated through the parameters NCV shaleoil and EF shaleoil: COEF i,y = NCVshaleoil * EF shaleoil = 31.8 (GJ/ton) * 0.0733 (tCO2e/GJ) = 2.33094 (tCO2e/ton)
Value applied:	2.33094
Justification of the choice of data or description of measurement methods and procedures actually applied:	Required by the "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion"(version 02, EB 41, Annex 11) to calculate the project emissions (CO_2 emissions from the consumption of shale oil in the project activity).

Data / Parameter:	**ηth**
Data unit:	%
Description:	The efficiency of the plant using fossil fuel that would have been used in the absence of the project activity.
Source of data used:	Value provided by the project proponent
Value applied:	100 %
Justification of the choice of data or description of measurement methods and procedures actually applied:	*Dori's* facilities do not use to monitor the energy generated by the shale oil consumed. However, it is well known the amount of shale oil consumed as well as the amount of fuel required to generate a ton of steam. Therefore, this project will estimate the baseline emissions through the energy generated by the real consumption of fossil fuel and assuming that ηth is 100%.
Any comment:	-

B.4. Data and parameters monitored:

Data / Parameter:	**Qrenbiomass**

Data unit:	Tonnes
Description:	Amount of renewable biomass (per year)
Source of data to be used:	Values measured and supplied by the project proponent
Value of data	

Period	Wood chips consume (ton)		Peanut shells consume (ton)	
	Marília	Rolândia	Marília	Rolândia
2006	10.093,30	9.243,47	0,00	0,00
2007	13.665,40	13.278,83	2.075,11	0,00
2008	10.231,90	12.358,33	2.307,94	0,00
TOTAL	**33.990,60**	**34.880,62**	**4.383,05**	**0,00**

The periods referred for the renewable biomass consumption described above are:
2006 - from April 1st to December 31st.
2007- from January 1st to December 31st
2008 - from January 1st to October 31st.

Description of measurement methods and procedures to be applied:	The amount of renewable biomass will be monitored in accordance to the weight described in the receipts from the providers and the number of trucks which arrives in the companies. The biomass weighing will be done with a government approved scale for truck weighing to commercial standards. One truck of each biomass provider will be weighed once a month. In addition to the weighing registries, the amount of biomass will also be monitored through biomass invoices/receipts in order to double check the monitoring data. In case of divergence, the lower value will be employed.
QA/QC procedures to be applied:	The weighing-machine will be calibrated periodically according to the INMETRO[1] procedures and parameters, in order to guarantee the quality and precision of the amount of biomass weighted.
Any comment:	Data will be kept for two years after the end of the crediting period or the last issuance of carbon credits for this project activity, whichever occurs later.

Data / Parameter:	**HGy**
Data unit:	TJ
Description:	Amount of heat supplied (per year)
Source of data to be used:	The amount of steam generated (Qsteam - tonnnes) is measured by the project developer (*Dori Alimentos*) and converted in TJ through the equation: HGy (TJ) = Qshaleoil (ton) * NCVshaleoil (TJ/ton)
Value of data	

Period	Amount of heat supplied by the renewable biomass (TJ)	
	Marília	Rolândia
2006	82,73	110,25

[1] INMETRO – Instituto Nacional de Metrologia, Normalização e Qualidade Industrial *(National INstitute for metrology, normalization and indesrial quality) is a federal institution, responsible for verifiying calibration and quality procedures in Brazil.*

	<table><tr><td>**2007**</td><td>133,56</td><td>137,45</td></tr><tr><td>**2008**</td><td>116,78</td><td>118,70</td></tr><tr><td>**TOTAL**</td><td>**333,07**</td><td>**366,41**</td></tr></table> The periods referred for the renewable biomass consumption described above are: 2006 - from April 1st to December 31st. 2007- from January 1st to December 31st 2008 - from January 1st to October 31st.
Description of measurement methods and procedures to be applied:	The amount of steam generated will be monitored with the use of a flow meter connected to the boiler. The flow meter will be periodically calibrated (each 6 months), following the INMETRO procedures and registered in calibration reports. The values of HGy will be monitored monthly.
QA/QC procedures to be applied:	
Any comment:	The flow meter comes back with Kg/h, which easily transforms into tonnes of steam. The values of HGy represent the amount of heat supplied only by the renewable biomass (the heat supplied by the fuel oil consumed in the project activity was discounted).

Data / Parameter:	**Qshaleoil**
Data unit:	Tonnes
Description:	Amount of shale oil that would be consumed in the baseline scenario
Source of data to be used:	Calculated based on the amount of steam generated and a conversion factor provided by *Dori Alimentos.* Qshaleoil = Qsteam (tonnes of steam)* conversion factor (tonnes of shaleoi/tonnes of steam)
Value of data	<table><tr><th rowspan="2">Period</th><th colspan="2">Shale oil consume (ton)</th></tr><tr><th>Marília</th><th>Rolandia</th></tr><tr><td>**2006**</td><td>175,02</td><td>86,55</td></tr><tr><td>**2007**</td><td>139,95</td><td>112,56</td></tr><tr><td>**2008**</td><td>115,15</td><td>130,92</td></tr><tr><td>**TOTAL**</td><td>**430,12**</td><td>**330,03**</td></tr></table> The periods referred for the renewable biomass consumption described above are: 2006 - from April 1st to December 31st. 2007- from January 1st to December 31st 2008 - from January 1st to October 31st.
Description of measurement methods and procedures to be applied:	The amount of shale oil consumed will be calculated through the amount of steam generated in a month (Qsteam), which is measured monthly by the project proponent and a conversion factor (calculated by the project proponent)
QA/QC procedures to be applied :	The project developer will be responsible for gathering and maintaining in adequate achieve all data from steam production

	(measured by flow meter daily).
Any comment:	Data will be kept for two years after the end of the crediting period or the last issuance of carbon credits for this project activity, whichever occurs later.

Data / Parameter:	**QSteam**
Data unit:	Tonnes
Description:	Amount of steam generated by the boiler (per year)
Source of data to be used:	Measured daily by the project proponent (*Dori Alimentos*)
Value of data	

Period	**Steam from the shale oil (ton)**		**Steam from the renewable biomass (ton)**	
	Marília	**Rolândia**	**Marília**	**Rolândia**
2006	2.362,82	1.228,82	31.695,00	40.254,85
2007	1.889,31	1.519,52	49.695,00	51.415,91
2008	1.554,47	1.767,42	45.665,00	45.562,03
TOTAL	**5.806,61**	**4.515,76**	**127.055,00**	**137.232,79**

The periods referred for the renewable biomass consumption described above are:
2006 - from April 1st to December 31st.
2007- from January 1st to December 31st
2008 - from January 1st to October 31st.

Description of measurement methods and procedures to be applied:	The amount of steam generated is measured monthly by a flow meter installed in the boiler by the project proponent and registered in electronic format (Excel sheets).
QA/QC procedures to be applied:	The project developer will be responsible for gathering and maintaining in adequate achieve all data from steam generation (measured by flow meter daily) and also for controlling the flow meter calibration (according to the INMETRO requirements).
Any comment:	Data will be kept for two years after the end of the crediting period or the last issuance of carbon credits for this project activity, whichever occurs later.

Data / Parameter:	**Renewable biomass origin**
Data unit:	Text
Description:	Origin of renewable biomass
Source of data to be used:	Documents proving that the biomass is renewable.
Value of data	Not applied.
Description of measurement methods and procedures to be applied:	The documentation (a Forestry Partnership Contract) from each renewable biomass provider will be provided annually to prove the renewable origin of the biomass through explanation of the management of the wood extraction areas.
QA/QC procedures to be applied :	The project developer will be responsible for gathering and maintaining in adequate achieve all documents related to the renewable biomass origin.
Any comment:	Data will be kept for two years after the end of the crediting period or the last issuance of carbon credits for this project activity, whichever

	occurs later.

Data / Parameter:	**Leakage of non-renewable biomass**
Data unit:	tCO_2e
Description:	Leakage resulted from the implantation of the project activity
Source of data to be used:	Estimated
Value of data	0
Description of measurement methods and procedures to be applied:	The sources of leakages predicted in meth I.C were monitored.
QA/QC procedures to be applied :	The leakage considered in this project activity are those regarding the General guidance on leakage in biomass project activities (Annex 18, EB 23), which are in consistency with the other biomass alternatives available in the project activity region (forest residues and peanut shells).
Any comment:	Information about the biomass availability in the region, as well as the other industries'fuel consumption will be monitored to check the occurrence of leakage.

Data / Parameter:	**$FC_{i,j,y}$**
Data unit:	Tonnes/year
Description:	Amount of fossil fuel combusted in the project activity
Source of data to be used:	Amount of shale oil consumed is monitored and supplied by the project proponent
Value of data	<table><tr><th rowspan="2">Period</th><th colspan="2">Shale oil consume (ton)</th></tr><tr><th>Marília</th><th>Rolandia</th></tr><tr><td>2006</td><td>175,02</td><td>86,55</td></tr><tr><td>2007</td><td>139,95</td><td>112,56</td></tr><tr><td>2008</td><td>115,15</td><td>130,92</td></tr><tr><td>TOTAL</td><td>430,12</td><td>330,03</td></tr></table> The periods referred for the renewable biomass consumption described above are: 2006 - from April 1st to December 31st. 2007- from January 1st to December 31st 2008 - from January 1st to October 31st.
Description of measurement methods and procedures to be applied:	The amount of shale oil consumed is measured monthly through level marks in the fuel tank. Also the total amount of fuel purchased is registered through receipt registries achieved in Dori´s head office.
QA/QC procedures to be applied :	The project developer will be responsible for gathering and maintaining in adequate achieves all documents related to the shale oil consumption and purchase.
Any comment:	Data will be kept for two years after the end of the crediting period or the last issuance of carbon credits for this project activity, whichever occurs later.

B.5. Calculation of emission reductions

The calculations were realized as established in the following equations:

BEy = HGy * EF CO2 /ηth (Equation 01)

Where:

BEy = The baseline emissions from steam/heat displaced by the project activity during the year y in tCO2e.

HGy = The net quantity of heat supplied by the project activity during the year y in TJ.

EFCO2 = The CO2 emission factor per unit of energy of the fuel that would have been used in the baseline plant in (tCO2 / TJ), obtained from reliable local or national data if available, otherwise, IPCC default emission factors are used.

ηth = The efficiency of the plant using fossil fuel that would have been used in the absence of the project activity.

Dori's facilities do not monitor the energy generated by the shale oil consumed. However, it is well known the amount of shale oil consumed as well as the amount of fuel required to generate a ton of steam. Therefore, this project will estimate the baseline emissions through the energy generated by the real consumption of fossil fuel and assuming that ηth is 100%.

As no specific equation is mandatory under the methodology applied to this project activity (AMS.I-C: Thermal energy for the user with or without electricity, version 13, EB 38) to calculate the net quantity of heat/ thermal energy generated by the fossil fuel in the project activity (HGy) during the year *y* (in TJ), this parameter was calculated according to the equation 02, an equation determined by the project proponent based on specific data available at the project activity sites and on the net calorific value of the shale oil (default value provided by the IPCC):

HGy = Qoil x NCVshaleoil (Equation 02)

Where:

Qshaleoil = Amount of shale oil consumed (ton)

NCVshaleoil = Net calorific value of shale oil (TJ/ton)

Leakage

The leakage predicted in the baseline and monitoring methodology AMS-I.C - Thermal energy for the user with or without electricity (version 13, EB 38) is not applicable for this project activity as there is no transference of equipment. As described in section 1.9, new equipments were acquired for the project activity implementation, so no leakage is to be considered in the emission reductions calculations.

In addition, these kind of industry (food industries) are very present in the states where the project activity is being implemented, which means that the project activity will not disturb in any aspects the wood or peanut market once that is a plenty of this kind of biomass available.

The tables below show the main wood chips and peanut shells providers, their location and percentage of contribution for the both unities.

Table 1 - Wood chips providers for both unities.

Unity	**Biomass Providers**	**Percentage**
Head Office - *Marília*, SP	Grupo Brancalhão	100%
Subsidiary - *Rolândia*, PR	Grupo Brancalhão	61%
	Maurício C. Rodrigues Madeiras	6%
	Madeireira e Serraria SK *LTDA.*	33%

Table 2 - Peanut shells providers for Head Office Unity.

Unity	Biomass Providers	Percentage
Head Office - *Marília*, SP	Angelo Marcio Calixt	58%
	Yoki Alimentos S.A	25%
	Dori Alimentos LTDA	17%

The leakage from biomass projects, like the project activity, shall also be estimated according to the "General guidance on leakage in biomass project activities (Annex 18, EB 23)" of Indicative Simplified Baseline and Monitoring Methodologies for Selected Small-Scale CDM Project Activity Categories, which identifies different emission sources based on type of biomass being considered and states that a minimum of 25% above the amount of biomass used in the project activity shall be available in the project activity region, avoiding the lack of biomass supply for other buyers.

Table 3. Sources of leakage according to the type of the biomass used.

Biomass Type	Activity/ Source	Shift of pre project activities	Emissions from biomass generation/ cultivation	Competing use of biomass
Biomass from forests	Existing forests	-	-	X
	New forests	X	X	-
Biomass from croplands or grasslands (woody or non-woody)	In the absence of the project the land would be used as a cropland/wetland	X	X	-

	In the absence of the project the land will be abandoned	-	X	-
Biomass residues or waste	Biomass residues or wastes are collected and used.	-	-	X

Observing table above, the source of leakage of the present project is showed below according to each type of biomass applied to the *Dori*'s units.

Forest Residues (Sawdust/wood chips)

Forest Residues are also a probable fuel to be used for steam generation in the project activity units. The production of wood generates a large amount of residues, which can be reused to generate thermal energy. As can be observed in the figure 5, the potential of energy generation in the states of *São Paulo* and *Paraná* are extremely high, which means that there is an enormous availability of this kind of fuel to be employed in the project activity units (*Rolândia-PR* and *Marília-SP*).

Also, the average amount of wood chips consumed yearly by the project activity (72,543.63 m3) represents only 0.22% of all wood chips and wood residues produced in the States of *São Paulo* and *Paraná,* as can be seen in table 12. This way, the use of this biomass does not have potential to generate leakage emissions due to its high availability.

Figure 1- Forest Residues Potential for Energy Generation[1]

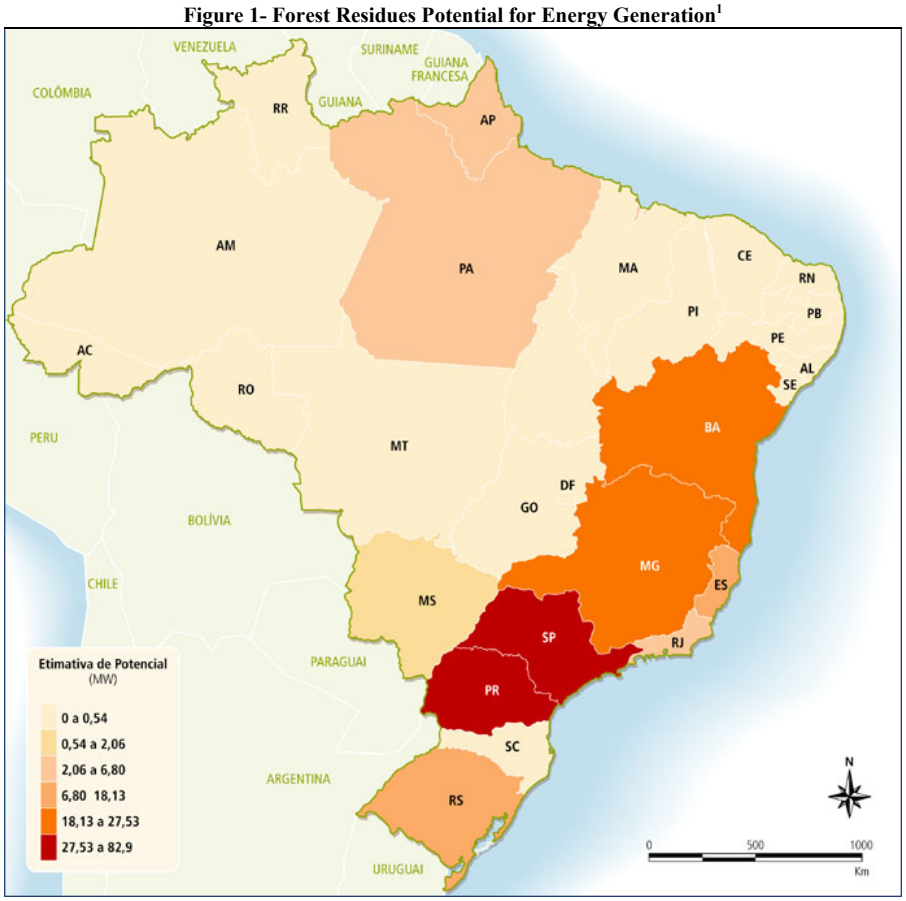

Table 4– Production of wood logs and wood residues in the States of São Paulo and Paraná. Source: IBGE 2007 - http://www.ibge.gov.br/estadosat/index.php

	São Paulo	***Paraná***
Production of wood log - 2007	25,966,464 m^3	23,759,668 m^3
Amount of wood chips produced per m3 of wood log[2]	65 %	
Total residues generated	16,878,202 m^3	15,443,784 m^3
Average amount of renewable biomass (wood chips) consumed by the project activities.	72,543.63 m^3/year	

Peanut Shell

Peanut Shell is the other renewable biomass used in the project activity (only in the *Marília* unit). The state of *São Paulo* is the biggest producer of peanut of Brazil. Table 13 shows the total amount of peanut produced between the years 2005 and 2007 in the state of *São Paulo* and Brazil. According to IBGE (Geographic and Statistic Brazilian Institute), the shell represents thirty percent of peanut's weight[3].

Table 5- Peanut Production in the state of *São Paulo*. Source: www.iica.org.br/Docs/Publicacoes/PublicacoesAgricolas/Lev03_Safra20062007.pdf

Peanut production in *São Paulo* State		
First and Second Harvest		
Harvest	2005/2006	2006/2007
Peanut production (in thousands of tonnes)	207.8	188.3
Peanut shells (in thousands of tonnes)	62.34	56.49

As the peanut shells used in *Dori Alimentos* head office are a residue of the peanut candies' production process, they are classified as a "biomass residue or waste", which according to table 9, characterizes a competing use of biomass. As the consume of peanut shells by the project activity (average of 2,075.16 tonnes per year) represents only 0,04% of all peanut shells produced between years 2006 and 2007, there is no leakage to be considered.

Project Emissions

The project emissions are those related to the CO_2 emissions from the consumption of shale oil and are calculated according to the second version of the methodological tool "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion" (EB 41, annex 11). The shale oil consumption in the project activity is considered a minor emission source once the small amount of fossil fuel consumption is required only to perform cleaning and maintenance of the steam generation equipments, so it is a sporadic routine.

The project emissions (PEy) are calculated through equation 03:

$$PEy = FC_{i,j,y} * COEF_{i,y} \quad \textbf{(Equation 03)}$$

[2] According to Brand (et. al 1999), 65% of all forestry produced yearly becomes waste biomass - BRAND, M.A; MUNIZ, G.I.B.; SILVA, D.A.; KLOCK. U. Caracterização do rendimento e quantificação dos resíduos gerados em serrarias através do balanço de materiais. Revista Floresta 32(2) 247-259. Paraná, 2001 (Characterization of the income and measurement of the waste generated in sawmills through the material balance. "Floresta" Magazine 32(2)).

[3] *Source: <cenbio.iee.usp.br/download/metodologiabiomassa.pdf>*

Where:

PEy: Project CO_2 emissions from the combustion of fossil fuel (tonnes of CO_2 eq)
FC $_{i,j,y}$: Amount of fossil fuel combusted in year y (tonnes of fossil fuel)
COEF $_{i,y}$: CO_2 emission coefficient of the fossil fuel used in year y (tonnes of CO_2 eq/ tonnes of fossil fuel)

The parameter COEF $_{i,y}$ value is 2.33094 tCO_2e/ton and was calculated as per the following equation, required in the methodological tool (EB 41, annex 11):

$COEF_{i,y} = NCV_{i,j} * EF_{CO2i,j}$ (Equation 04)

Where:
COEF $_{i,y}$: CO_2 emission coefficient of the fossil fuel used in year y (tonnes of CO_2 eq/ tonnes of fossil fuel
$NCV_{i,j}$: weighted average net calorific value of the fuel type i in year y = NCV shaleoil (GJ/ tones of fossil fuel)
$EF_{CO2i,j}$: weighted average CO_2 emission factor of fuel type i in year y = EFshaleoil (tones of CO_2 eq/ GJ)

Emission Reductions
According to the methodology applied to this project activity (AMS.I-C, version 13), the emission reductions shall be calculated considering these criteria:

"21. If fossil fuel is used, the thermal energy or the electricity generation metered should be adjusted to deduct thermal energy or electricity generation from fossil fuels using the specific fuel consumption and the quantity of fossil fuel consumed."(option 1)

"23. The amount of thermal energy or electricity generated using biomass fuels calculated as per paragraph 21 shall be compared with the amount of thermal energy or electricity generated calculated using specific fuel consumption and amount of each type of biomass fuel used. The lower of the two values should be used to calculate emission reductions." (option 2)

As the project activity consumes a small amount of fuel oil (as described above in "project emissions") and also renewable biomass (wood chips and peanut shells), the emission reductions calculations were made deducing the amount of thermal energy generated by the fossil fuel consumption, so that the final results represent only the amount of emission reductions generated by the consumption of the renewable biomass.

ERy = BEy – LEy - PEy (Equation 03)

Where:

ERy	=	Emission reduction in the year "y" (tonnes of CO_2 eq.)
BEy	=	Baseline emissions of CO_2 that would be generated through native wood burning (tonnes of CO_2 eq.)
LEy	=	Emissions from the project activity's leakage, in the year "y" (tonnes of CO_2 eq.)
PEy	=	Project CO_2 emissions from the combustion of shale oil (tones of CO_2 eq)

Calculations of the quantity of shale oil that would be generated in the absence of the project through the amount of steam generated:

Shale oil = Steam generated * 0.074074 (Efficiency Factor)

B.6. Monitoring results

Based on the applied methodology and on monitored data as well considering the high contribution to sustainability, the project participants request the carbon credits due to **51,254 tCO_2e** for the monitoring period applied: from 1st April 2006 to 31st October 2008**.**

Dori Alimentos – Head Office (Marília)

MARÍLIA (head office)		**Total of shale oil consumed by the project activity (ton)**	**Shale oil necessary to generate steam (ton)**	**Total shale oil that would be consumed by the project activity (ton)**
Year	Month			
2006	April	26.16	219.19	245.35
	May	11.57	258.15	269.72
	June	11.80	243.56	255.36
	July	5.55	276.15	281.70
	August	4.72	283.19	287.90
	September	43.23	247.70	290.94
	October	11.34	288.15	299.48
	November	16.14	277.63	293.77
	December	44.51	254.07	298.59
	Total	*175.02*	*2,347.78*	*2,522.80*
2007	January	4.64	286.30	290.94
	February	3.10	286.30	289.39
	March	8.00	236.59	244.59
	April	16.77	322.15	338.92
	May	18.57	294.59	313.16
	June	7.22	317.85	325.08
	July	5.68	280.59	286.27
	August	21.67	310.96	332.64
	September	9.80	334.00	343.80
	October	17.55	315.04	332.58
	November	21.79	337.63	359.42
	December	5.16	324.74	329.90
	Total	*139.95*	*3,646.74*	*3,786.69*
2008	January	12.39	342.59	354.98
	February	5.68	291.04	296.71
	March	7.22	334.67	341.89
	April	11.87	303.63	315.50
	May	6.19	328.22	334.41
	June	7.23	356.81	364.04
	July	11.35	376.59	387.94
	August	14.45	352.81	367.26
	September	28.46	333.70	362.16
	October	10.32	362.52	372.84
	Total	*115.15*	*3,382.59*	*3,497.74*
GENERAL TOTAL		**430.12**	**9,377.11**	**9,807.23**

Table 6 - Quantity of shale oil that would be employed in the absence of the project in Dori Alimentos Head Office (*Marília*).

*Dori Alimentos – Subsidiary Company (*Rolândia*)*

ROLÂNDIA (subsidiary unit)		Total of shale oil consumed by the project activity (ton)	Shale oil necessary to generate steam (ton)	Total shale oil that would be consumed in the absence of the project (ton)
Year	Month			
2006	April	4.73	313.23	317.96
	May	2.11	356.41	358.51
	June	33.91	315.07	348.98
	July	3.54	338.95	342.49
	August	7.22	321.98	329.20
	September	5.24	362.97	368.21
	October	3.04	316.38	319.42
	November	3.56	352.68	356.24
	December	23.21	304.17	327.38
	Total	*86.55*	*2,981.84*	*3,068.39*
2007	January	60.64	268.25	328.89
	February	3.68	268.25	271.93
	March	4.30	294.18	298.48
	April	2.69	320.20	322.89
	May	2.54	300.18	302.72
	June	3.46	327.29	330.75
	July	4.09	293.16	297.25
	August	3.37	339.09	342.46
	September	3.76	367.08	370.84
	October	4.33	330.16	334.49
	November	15.66	324.26	339.92
	December	4.03	290.22	294.25
	Total	*112.56*	*3,722.32*	*3,834.87*
2008	January	18.82	281.33	300.15
	February	2.06	267.08	269.14
	March	0.00	337.18	337.18
	April	23.03	312.06	335.09
	May	9.58	341.04	350.62
	June	9.54	362.93	372.47
	July	1.57	383.38	384.95
	August	65.30	297.51	362.80
	September	1.02	386.62	387.64
	October	0.00	405.85	405.85
	Total	*130.92*	*3,374.97*	*3,505.89*
GENERAL TOTAL		**330.03**	**10,079.12**	**10,409.15**

Table 7 - Quantity of shale oil that would be employed in the absence of the project in Dori Alimentos Subsidiary Company (*Rolândia*).

Baseline Emissions and Emission Reductions

The crediting period according to the V-C-S 2007 Standard. which the project follows the rules. starts in the end of March 2006. this way the crediting period contemplates from 1st April 2006 to October 31st. 2008:

Dori Alimentos – Head Office

	Year	Total of shale oil consumed by the project activity (ton)	Total of renewable biomass consumed by the project activity (m3)		Total energy produced by the renewable biomass (TJ)	Total Emission Reductions (tCO2e)
			wood chips	peanut shells		
2006	April	26.16	2,482.00	0.00	7.35	**538**
	May	11.57	3,016.00	0.00	9.39	**688**
	June	11.80	2,950.00	0.00	8.82	**646**
	July	5.55	3,046.00	0.00	10.31	**755**
	August	4.72	3,472.00	0.00	10.60	**777**
	September	43.23	3,160.00	0.00	7.78	**570**
	October	11.34	3,686.00	0.00	10.54	**772**
	November	16.14	3,684.00	0.00	9.95	**729**
	December	44.51	3,342.00	0.00	7.98	**585**
	TOTAL					**6,064**
2007	January	4.64	3,956.00	0.00	10.72	**786**
	February	3.10	2,894.00	0.00	10.78	**790**
	March	8.00	3,740.00	472.00	8.71	**638**
	April	16.77	2,534.00	1,570.00	11.63	**852**
	May	18.57	2,522.00	2,934.00	10.51	**770**
	June	7.22	2,196.00	2,376.00	11.83	**867**
	July	5.68	2,560.00	2,080.00	10.47	**767**
	August	21.67	3,302.00	1,728.00	11.01	**807**
	September	9.80	3,496.00	1,856.00	12.35	**904**
	October	17.55	3,928.00	1,800.00	11.33	**830**
	November	21.79	3,714.00	2,216.00	12.03	**881**
	December	5.16	4,202.00	704.00	12.17	**892**
	TOTAL					**9,789**
2008	January	12.39	3,850.00	768.00	12.58	**921**
	February	5.68	2,142.00	2,304.00	10.86	**796**
	March	7.22	3,276.00	1,536.00	12.47	**914**
	April	11.87	2,568.00	2,176.00	11.11	**814**
	May	6.19	3,788.00	832.00	12.26	**898**
	June	7.23	2,642.00	2,684.00	9.55	**700**
	July	11.35	2,956.00	2,454.00	12.32	**902**
	August	14.45	2,608.00	2,428.00	11.01	**806**
	September	28.46	2,430.00	2,362.00	11.42	**836**
	October	10.32	2,974.00	2,182.00	13.20	**967**
	TOTAL					**8,560**
	Total	**430**	**97,116**	**37,462**	**333**	**24,413**
	Number of months considered					31
	Average emission reductions per month (tCO2e)					**788**

Table 8 - Actual amount of fuel (shale oil and renewable biomass) consumed by the project activity and total emission reductions achieved by the project in Dori Alimentos Head Office.

Dori Alimentos – Subsidiary Company

	Year	Total of shale oil consumed by the project activity (ton)	Total of renewable biomass consumed by the project activity (m3) wood chips	Total energy produced by the renewable biomass (TJ)	Total Emission Reductions (tCO2e)
2006	April	4.73	2,921.60	11.75	**861**
	May	2.11	3,131.20	13.49	**988**
	June	33.91	2,312.00	10.71	**784**
	July	3.54	2,966.40	12.78	**936**
	August	7.22	3,084.80	11.99	**878**
	September	5.24	3,189.90	13.62	**998**
	October	3.04	3,055.50	11.93	**874**
	November	3.56	2,962.00	13.29	**974**
	December	23.21	2,786.50	10.70	**783**
	TOTAL				**8.076**
2007	January	60.64	2,474.00	7.91	**579**
	February	3.68	2,902.00	10.08	**738**
	March	4.30	2,781.00	11.04	**808**
	April	2.69	2,945.50	12.09	**886**
	May	2.54	3,444.00	11.33	**830**
	June	3.46	3,091.00	12.33	**903**
	July	4.09	3,403.50	11.00	**806**
	August	3.37	3,441.00	12.78	**936**
	September	3.76	3,214.50	13.84	**1.014**
	October	4.33	3,658.50	12.41	**909**
	November	15.66	3,374.00	11.75	**861**
	December	4.03	3,210.50	10.90	**798**
	TOTAL				**10.068**
2008	January	18.82	3,742.50	9.99	**732**
	February	2.06	3,768.00	10.09	**739**
	March	0.00	3,805.00	12.84	**941**
	April	23.03	3,364.20	11.00	**806**
	May	9.58	3,246.30	12.62	**925**
	June	9.54	3,469.50	13.21	**968**
	July	1.57	3,651.00	12.78	**936**
	August	65.30	2,682.00	9.39	**688**
	September	1.02	3,336.00	12.95	**949**
	October	0.00	4,245.00	13.82	**1.013**
	TOTAL				**8.697**
	Total	**330**	**99,659**	**366**	**26,841**
	Number of months considered				31
	Average emission reductions per month (tCO2e)				**866**

Table 9 — Actual amount of fuel (shale oil and renewable biomass) consumed by the project activity and total emission reductions achieved by the project in Dori Alimentos Subsidiary Company.

Year	Number of months	Head Office Emission Reductions (tCO2e)	Subsidiary Company Emission Reductions (tCO2e)
2006	9	6,064	8,076
2007	12	9,789	10,068
2008	10	8,560	8,697
total	31	**24,413.00**	**26,841.00**
Project total emission reductions (period from 1st April 2006 to 31st October 2008)		**51,254.00 tCO_2e..**	

Table 10 - Total Emission Reductions achieved by the project activity during the period between April 1st 2006 and October 31st 2008 (in tonnes of CO2eq).

B.7. Date of completion of the monitoring report and the name of the responsible person(s)/entity(ies)

The responsible for projects monitoring is Mrs. Márcia S. Cavicchioli de Oliveira.

The monitoring report was completed in October 27th 2009 by Beatriz Kiss from *CantorCO2e Brasil*.