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

CONTENTS

Annexes

Revision history of this document

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

SECTION A. General description of small-scale project activity

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

Nobrecel fuel switch in black liquor boiler Project
PDD Version Number 05
25 February 2007

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

The Nobrecel fuel switch in black liquor boiler Project (hereafter, the "Project") developed by Nobrecel Celulose e Papel (hereafter referred to as the "Project Developer") and EcoSecurities consists of improvements to a Black-liquor recovery boiler (CRQ – from Portuguese – "Caldeira de Recuperação Química") resulting in a decrease in fuel oil consumption. The project is located in a cellulose and paper mill, situated in Pindamonhangaba, São Paulo, Brazil, hereafter referred to as the "Host Country".

The Project consists of improvements in the structure and operation of the CRQ. The boiler has an installed capacity of 45 tonnes of steam per hour, consuming fuel oil and black-liquor from the process as fuel. The improvements will allow the boiler to almost exclusively use black-liquor as fuel. Black liquor is an organic by-product of pulp and paper production, therefore a renewable fuel.

The project is helping the Host Country fulfill its goals of promoting sustainable development. Specifically, the project:

- Increases employment opportunities in the area where the project is located;
- Uses clean and efficient technologies, and conserves natural resources, thus the project will be meeting the Agenda 21 and Sustainable Development Criteria of Brazil.
- Contributes to local environmental sustainability since it will decrease the use of fossil fuels, and replace them with an alternative renewable source. Therefore, the project contributes to the better use of natural local resources.
- Contributes towards better revenue distribution since the use of a renewable fuel decreases dependence on fossil fuels, and decreases pollution and therefore the social costs related to this. In addition the project diversifies sources of steam generation.
- Contributes to technological and capacity development – all technology, labour and technical maintenance will be provided inside Brazil.

Contributes to regional integration and connection with other sectors – the project may encourage other similar companies that want to replicate the Project experience.

A.3. Project participants:

Table 1 - 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)	Nobrecel Celulose e Papel	No
United Kingdom of Great Britain and Northern Ireland	EcoSecurities Ltd.	No

(*) In accordance with the CDM modalities and procedures, at the time of making the CDM-PDD public at the stage of validation, a Party involved may or may not have provided its approval. At the time requesting registration, the approval by the Party(ies) involved is required.

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

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

A.4.1.1. Host Party(ies):

Brazil. (the "Host Country")

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

Southeast region, São Paulo State.

A.4.1.3. City/Town/Community etc:

Pindamonhangaba City

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

Rodovia Vereador Abel Fabrício Dias, s/nº, Km 155, Distrito de Moreira César, Caixa Postal 1, Zipcode 2400-970, in the municipality of Pindamonhangaba, São Paulo State.
GPS location: S 22° 54' 07.7 " W 45° 23'35.3 "

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

The Project applies to the sectoral scope number 1 – Energy Industry (Renewable energy projects). According to the Small Scale simplified procedures the project fits in Type I category I.C.

The Project applies to category I.C because the project activity is a renewable technology (uses only Black liquor) and has an installed capacity smaller than 45MW thermal.

The Project Activity consists of the installation of new equipments that will enable an increase in the black-liquor solid mass concentration and the use of this new fuel in the boiler. This procedure will elevate the specific calorific value of the black liquor, allowing it to be burned reducing the fuel oil amount. The total installed capacity after all these improvements will be 45 tonnes of steam per hour, with steam enthalpy of 0.93 MWthermal per tonne of steam, representing less than 45MWthermal.

Black liquor is a byproduct formed during the Kraft process, the sulfate method of chemical pulping of wood in the papermaking industry. In this process, lignin is separated from cellulose, with the latter forming the paper fibers. Black liquor is the combination of the lignin residue with water and the chemicals used for the extraction. Given the amount of water, the calorific value is very low. To increase the concentration of solid mass, and consequently increase the calorific value, it is required to remove the moisture content.

In the Baseline scenario, steam was used to increase the concentration of solid mass in the black liquor up to 40%. Compared to the baseline process, The project activity will improve the use of steam, allowing an increase in the concentration of solid mass up to 70% (the remaining 30% are water), and make modifications in the boiler to allow the burning of concentrated black liquor. To reach this result, the process is divided in three phases:

Phase 1: Improvement on three evaporation reservoirs. The evaporation reservoirs are composed of black liquor and steam pipelines. Under vacuum conditions, the heat from steam boils the water from black liquor, increasing the solid mass concentration. These improvements are related to changes on the pipelines and new design on pipes. It will not lead to an increase in steam consumption, but more efficient use (please note that no carbon credits are requested through this isolated improvement).

Phase 2: Installation of new equipment called "Cristalizador". The Cristalizador even further improves the utilization of steam for drying the black liquor. The "Cristalizador" is heat exchanger equipment. Together with the actions from Phase 1, this equipment will lead to an increase in the efficiency of steam use, from 2 tonnes of water removed/ ton of steam, to 6 tonnes of water removed/ton of steam. This new process includes an increase in the electricity consumption as a result of the installation of 2 pumps of 250 HP (0.186 MW) for black liquor recirculation (please note that no carbon credits are requested through this isolated improvement).

Phase 3: Retrofit in the CRQ boiler. This action allows the consumption of concentrated black liquor as fuel, instead of a mix of fuels (black liquor and fuel oil). The retrofit includes modifications on the air feeding system, fuel feeding system and water feeding system. All these modifications do not increase the lifetime from equipments (boiler installed in 1999).

All these three phases will be implemented by the end of 2006. The technology and know-how being promoted by this project is environmentally safe and sound, and will further promote such activities in the future.

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

Annual estimation of emission reductions over the chosen crediting period

Years	Annual estimation of emission reductions over the chosen crediting period
2007	33 330
2008	33 330
2009	33 330
2010	33 330
2011	33 330
2012	33 330
2013	33 330
Total estimated reductions (tonnes of CO_2)	233 312*

Total number of crediting years	7
Annual average over the crediting period of estimated reductions (tonnes of CO_2)	33 330

* Inconsistency due to rounding.

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

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

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

The Project Developer is developing another large-scale CDM project: "NOBRECEL Biomass Project", using methodology to ACM0006. However, this other project is significantly different and could not be considered as part of the same project as the one being considered here. The other PDD involves different equipments and technologies.

According to Appendix C of the Simplified Modalities and Procedures for Small-Scale CDM project, the project is not a debundling. The reduction of fossil fuel usage presents the same sectoral scope but is not the same technology since this project activity consists of technical improvements on black-liquor recovery boiler while the other project is a wood residue co-generation plant.

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:

The project uses approved methodology AMS-I.C. (Thermal energy for the user), Version 9, Dated 23 December 2006.

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

According to the sectoral scope list presented by the UNFCCC (http://cdm.unfccc.int/), the project is related with the sectoral scope 1 Energy industries (renewable - / non-renewable sources).

The CRQ boiler will present an installed capacity less than 45MWthermal and will use the renewable black-liquor (organic by-product from pulp production), thus the project is applicable to methodology I.C.

B.3. Description of the project boundary:

For thermal energy, the physical, geographical site of the renewable energy generation delineates the project boundary. It means that the project boundary is restricted to the CRQ boiler, and equipments to improve the black liquor calorific value. For conservativeness, emissions associated with fuel oil transportation will be excluded. The only emission source considered for the emission reduction calculation is the CO2 from fossil fuel burning and additional electricity consumption.

B.4. Description of baseline and its development:

Two alternatives to the project scenario are considered:

- Alternative 1 - The continuation of current activities – This scenario represents the continuation of current practices, which is continuation of current fuel oil consumption in the black-liquor recovery boiler.
- Alternative 2 - The improvements in the CRQ without CDM – In this scenario, improvement will be done in the boiler allowing consumption of black-liquor only, implemented without considering CDM revenues.

Assessment of Alternatives:

Alternative 1: Continuation of the current situation would require no investments on the part of the project developer, and would not face any technological or other barriers. The black liquor would continue to be burned with a low calorific value and high water content, needing a large amount of fuel oil to produce heat in the boiler.

Alternative 2: This alternative would face investment and other barriers outlined in section B.5 below, therefore is not considered viable.

Therefore Alternative 2, improvements in the boiler to consume black liquor only, faces the largest number of barriers when compared with Alternative 1, and therefore is unlikely to be implemented in the absence of the CDM (i.e. is not the baseline scenario). The investments necessary to implement the project activities are very high. Due to capital access constraints, and technological innovations required, the project activity faces barriers to its implementation. The detailed barrier analysis is presented in section B.5.

Alternative 1, continuation of the current situation, would face the least barriers, and is therefore identified as the baseline scenario.

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

Variable	Unit	Data Source
Fuel oil emission factor	ton CO2/ton	Calculated based on IPCC 2006 data
Project cash flow	Text	Project developer
Steam produced from fuel oil	MWh	Historical direct measurement - Project developer
Steam produced from black liquor	MWh	Historical direct measurement - Project developer

B.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered small-scale CDM project activity:

According to Attachment A to Appendix B of the simplified modalities and procedures for CDM small-scale project activities, evidence as to why the proposed project is additional can be produced by conducting an analysis of the following: (a) investment barriers, (b) technological barriers, and (c) prevailing practice. The result is a matrix that summarizes the analysis, providing an indication of the barriers faced by each scenario. The most plausible scenario will be the one with the fewest barriers.

The first step in the process is to list the likely future scenarios. Two scenarios were considered:

- Scenario 1 - The continuation of current activities – This scenario represents the continuation of current practices, which is continuation of current fuel oil consumption in the black-liquor recovery boiler.
- Scenario 2 - The improvements in the CRQ – In this scenario, improvement will be done in the boiler allowing consumption of black-liquor only.

The barriers are as follows:

- Financial/economic – This barrier evaluates the viability, attractiveness and financial and economic risks associated with each scenario, considering the overall economics of the project and/or economic conditions in the country.

- Technical/technological – This barrier evaluates whether the technology is currently available, if there are indigenous skills to operate it, if the application of the technology is a regional, national or global standard, and generally if there are technological risks associated with the particular project outcome being evaluated.

- Prevailing business practice – This barrier evaluates whether the project activity represents prevailing business practice in the industry. In other words, this barrier assesses whether in the absence of regulations it is a standard practice in the industry, if there is experience to apply the technology and if there tends to be high-level management priority for such activities.

With respect to **financial/economic** barriers:

- The continuation of current practices (Scenario 1) does not pose any financial/economic barrier to the project developer, and requires no further financing.

- The improvements in CRQ (Scenario 2) faces specific financial/economic barriers.

As a consequence of a long period of inflation, the Brazilian currency experienced high volatility coupled with strong devaluation, effectively precluding commercial banks from providing any long-term debt financing to local companies. The lack of a long-term debt market caused a severe negative impact on the financing of energy projects in Brazil. Real interest rates have been extraordinarily high since the Real plan stabilized inflation in 1994.

Interest rates for local currency financing are significantly higher than US Dollar rates. The National Development Bank – BNDES is the only supplier of long-term loans. Debt financing from BNDES are made primarily through commercial banks. The credit market is dominated by shorter maturities (90-days to 1-year) and long-term credit lines are available only to the strongest corporate borrowers and for special government initiatives. Credit is restricted to the short-term in Brazil or the long-term in dollars offshore.

Financial domestic markets with maturity of one year or greater practically do not exist in Brazil. Experience has shown that in moments of financial stress the duration of savings instruments contracted drops to levels close to one day with a massive concentration in overnight banking deposits. Savers do not hold long-term financial contracts due to the inability to price-in the uncertainty involved in the preservation of purchasing power value (Arida et al., 2004).

The lack of local long-term financing resulted from the reluctance of creditors and savers to lengthen the term of their investments. It has made savers opt for the most liquid investments and to place their money in short-term government bonds instead of investing in long-term opportunities that could finance infrastructure projects.

The most liquid government bond is the LFT (floating rate bonds based on the daily Central Bank reference rate). As of January 2004, 51.1% of the domestic federal debt was in LFTs that has duration of one day. This bond rate is almost the same as the CDI - Interbank Deposit Certificate rate that is influenced by the SELIC rate, defined by the Monetary Policy Committee COPOM.

The SELIC Rate has been very volatile ranging in 2003 from a maximum of 26,35% p.a. in February 2003 to a minimum of 16,3% p.a. in December 2003. The average SELIC rate in 2003 was 23,29% p.a.(http://www.bacen.gov.br/?SELICDIA)

The average SELIC rate in 2003 (year when decision for the project activity has been taken) has been chosen to the financial analysis. The project's IRR is also lower than SELIC rate even though it corresponds to a riskier investment compared to a Brazilian government bonds.

The capital costs involved in the project pose a barrier (investments of R$ 18.26 million), especially considering the above mentioned. It is worth noting that there are no direct subsidies or promotional support for the implementation of independent renewable energy plants. The financial barrier is demonstrated through a financial analysis, the results of which are presented in table below. The financial analysis is considering the investments related to the project activity, and revenues related to non purchase of fuel oil. As it can be seen, the costs of implementing the project without carbon are greater than the costs of maintaining current practices (business as usual) i.e. the baseline scenario. The carbon revenues increase the returns of the project to an acceptable level compared to the baseline.

Table: Financial Analysis Results

Carbon Credits Impacts	
	R$
NPV without credits	**(3.539.105)**
Carbon NPV	**3.570.664**
NPV considering Carbon Credits	**31.559**

Table: Sensitive Analysis Results

Sensitive Analysis	**Modification**	**NPV without CERs (R$)**	**NPV with Carbon (R$)**
Decrease on investments	10%	**(1.030.382)**	**2.540.282**
Increase on fuel price	10%	**(1.384.293)**	**2.186.371**
Decrease on Discount Rate	20%	**(1.270.698)**	**2.863.306**

With respect to the **technical/technological** barrier:

- In the case of Scenario 1 (continuation), there are no technical/technological issues as this simply represents a continuation of current practices and does not involve any new technology or innovation.

- In the case of Scenario 2, there is a small, but for conservativeness, not significant, technical/technological barriers. All the technologies involved in this scenario are available in the market, and have been used effectively in the Host Country. The only concern regarding it is the fact that it is largely applicable in big company papers (with production of more than 1500 tons of paper per day). Nobrecel is a small producer (250 tons per day), and therefore has restricted access to these technologies that require high operation and maintenance costs, because of a lack of the scales of economies available in larger companies.

With respect to the analysis of **prevailing business practice**:

- The continuation of current practices (Scenario 1) presents no particular obstacles. This practice has been used effectively in the past with good results, and the continued operation of existing facilities and actual practices presents no real barriers.

- The improvement in the CRQ plant (Scenario 2) represents a deviation from the prevailing business practices.

The Black liquor is a by-product that must be recovered after the pulp preparation. There are three different technologies to recover the black liquor: (1) combustion chamber, (2) boiler (generating low pressure steam) and (3) cogeneration plant (generating high pressure steam). The first technology is the cheapest one, requiring low investments compared to construction of a simple boiler. The cogeneration plant is the most expensive option.

In countries such as Brazil, where the capital costs are very high (loan rates up to 10% above the inflation rate), usually industry prefers less capital intensive options. The is especially true for smaller companies, which have more difficult access to capital. It is corroborated by the fact that according to BRACELPA (Brazilian association of pulp and paper producers), there are 44 associated producers in Brazil (some of them with more than one plant), and according to ANEEL (National Agency for electric sector) only 12 plants producing electricity (cogeneration plants, producing steam and electricity at once).

The recovery of black liquor in these three technologies can be done with the help of fossil fuels (i.e. mixing fuel oil), or treating it to improve the solid mass, allowing the use of black liquor as the only fuel. The second option requires high investments and high operational costs, representing the state of art of technology.

It is clearly demonstrated that a Black liquor cogeneration plant is not the business as usual practice in Brazil, especially for small producers. According to ANEEL, from the 12 Black Liquor cogeneration plants operating in Brazil, Nobrecel is the only small scale plant (smaller than 10 MW). Nine from the twelve plants are bigger than 30 MW.

Installed Capacity (kW)	Number of plants	Names
0 – 10 000	**1**	**Nobrecel**
10 000 – 20 000	1	Bacell
20 000 – 30 000	1	Lençois Paulista
30 000 – 50 000	4	Igaras; Celucat; Riocell; Klabin
50 000 – 100 000	3	Jari Celulose; Bahia Sul; Cenibra
100 000 – 200 000	1	Veracel
200 000 – 500 000	1	Aracruz

Source: www.aneel.gov.br

The process of use (in boiler or cogeneration plants) and improvements of black liquor (increase the solid mass) aiming to use it as only fuel is very expensive, requiring scale to dilute the high costs and complex operational structure, thus it clearly faces a barrier for small producers.

The table below summarizes the results of the analysis regarding the barriers faced by each of the plausible scenarios. As the table indicates, Scenario 1 faces no barriers, whereas Scenario 2 faces two important barriers – the financial/economic and the prevailing business practice barriers.

Table: Summary of Barriers Analysis

	Scenario 1	**Scenario 2**

Barrier Evaluated		Continuation of current activities	The improvement in CRQ
1.	Financial / Economical	No	**Yes**
2.	Technical / Technological	No	No
3.	Prevailing Business Practice	No	**Yes**

To conclude, the barrier analysis above has clearly shown that the most plausible scenario is the continuation of current practices. Therefore, the scenario 2 is not the same as the baseline scenario, and these are defined as follows:

- The **Baseline Scenario** consists of the continuation of fossil fuel consumption in the black-liquor recovery boiler. This boiler currently consumes 41.9 kg of fuel oil / MWh of steam.

- The **Project Scenario** is represented by improvements that will reduce fuel oil consumption in CRQ to almost zero.

The Project Scenario is additional in comparison to the baseline scenario, and helps promote sustainability, and therefore is eligible to receive Certified Emissions Reductions (CERs) under the CDM. This is based on full consideration of CDM from an early stage in project planning and development.

B.6. Emission reductions:

B.6.1. Explanation of methodological choices:

The emission reduction source is the reduction of fossil fuel consumption that would be burned in the black-liquor recovery boiler before the improvements. The fossil fuel used in the baseline is the average fuel oil consumption per MWh of steam generated based on the previous years: 41.9 kg of fuel oil / MWh steam. In the project scenario the fuel oil consumption per MWh of steam is expected to be around 3 kg of fuel oil / MWh steam.

The Methodology used in this document is applicable to the proposed project activity, as it is applicable to renewable energy technologies that supply individual households or users with thermal energy that displaces fossil fuels.

As this project activity is an energy generation system, it qualifies in this category as the energy output shall exceed 45 $MW_{thermal}$. The total installed capacity after all these improvements will be 45 tonnes of steam per hour, with steam enthalpy of 0.93 MW per tonne of steam, representing less than 45$MW_{thermal}$.

The Project therefore fulfils the conditions of small scale and falls into category I (renewable energy projects), and thus AMS-I.C. was considered the most appropriate methodology for the Project.

Project emissions:

For this project activity, were considered as project emissions the emissions from fuel oil co-fired mainly as startup at the black liquor boiler and the electricity consumed by the new black liquor dehydration system.

However, as Nobrecel produces the electricity consumed by its plant with biomass residues, the electricity consumed by the new CRQ system is from a renewable source, being considered as zero emissions from this source.

In conclusion, the only component, that will account for all project emissions in this project activity, is the emission of CO_2 during the burning of fuel oil in the CRQ. It is calculated as the amount of fuel burned times the fuel oil emission factor. IPCC default value is used for this emission factor.

Baseline emissions:

As stated in the methodology, for renewable energy technologies that displace technologies using fossil fuels, the simplified baseline is the fuel consumption of the technologies that would have been used in the absence of the project activity times an emission coefficient for the fossil fuel displaced.

However, as also stated in the methodology, For project activities that seek to retrofit or modify an existing facility for renewable energy generation the baseline scenario is, in the absence of the CDM project activity, the existing facility would continue to provide thermal energy at historical average levels, until the time at which the thermal energy facility would be likely to be replaced or retrofitted in the absence of the CDM project activity. From that point of time onwards, the baseline scenario is assumed to correspond to the project activity, and baseline thermal energy production is assumed to equal project thermal energy production, and no emission reductions are assumed to occur.

Baseline emissions then correspond to the difference of the thermal energy supplied by the project activity minus the baseline thermal energy supplied in the case of modified or retrofit facilities.

In order to estimate the point in time when the existing equipment would need to be replaced in the absence of the project activity, option (a) was chosen, meaning that the typical average technical lifetime of the equipment type was determined and documented, taking into account common practices in the sector and country. As the boiler involved in this project activity was installed in 1999, and the regular lifetime of such equipment is, at least, 40 years, there is enough lifetime left in the boiler to keep it working properly for the entire renewable crediting period of 21 years. Therefore, as this part of calculations is not applicable to this project activity, it was excluded.

Leakage emissions:

As the energy generating equipment is not transferred from another activity and the existing equipment is not transferred to another activity, leakage is not considered.

Emission reductions:

The greenhouse gas emission reductions achieved by the project activity during a given year "y" (ER_y) shall be estimated as follows:

$$\mathbf{ERy = BE(boiler)y - (PE(boiler)y + Leakage)}$$

Where:

ER_y Emission reduction during a year *y*, in tonnes of CO_2 equivalents (t CO_2e);

PE(boiler)y Project emission due to fuel oil consumption in the black liquor boiler during a year *y*, in tonnes of CO_2 equivalents (t CO_2e);

BE(boiler)y Baseline emission due to energy produced by historic fuel oil consumption minus the energy produced by the renewable fuel, during a year *y*, in tonnes of CO_2 equivalents (t CO_2e).

All equations applied to obtain the emission reduction from the project activity are listed in Section B.6.3.

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

Data / Parameter:	**EGhistoric**
Data unit:	MWh
Description:	3-year average of historical thermal energy from renewable source delivered by the existing facility
Source of data used:	Project developer
Value applied:	184 211
Justification of the choice of data or description of measurement methods and procedures actually applied :	Data monitored by appropriate equipment and the average was calculated according to the methodology.
Any comment:	

Data / Parameter:	**EFy,fuel**
Data unit:	tonnes CO_2 per tonne fuel
Description:	CO_2 emission factor for the combustion of the fuel
Source of data used:	Calculated based on IPCC 2006 data
Value applied:	3.127
Justification of the choice of data or description of measurement methods and procedures actually applied :	Conservative values was used for this calculation.
Any comment:	

Data / Parameter:	**Qhistoric**
Data unit:	ton of fuel/MWh steam
Description:	Quantity of fuel that would be used to generate one megawatt-hour based on the 3 years previous to project starting date.
Source of data used:	Calculated based on project developer data
Value applied:	0.084
Justification of the choice of data or description of measurement methods and procedures actually applied :	The historical fuel consumption was monitored by stock and the steam produced monitored by appropriate meter. All data were consolidated and used for the calculation of this parameter.
Any comment:	

Data / Parameter:	**Enthalpy**
Data unit:	MWh/ tonnes of steam
Description:	Steam enthalpy
Source of data used:	Project developer
Value applied:	0.93
Justification of the choice of data or description of measurement methods and procedures actually applied :	This value calculated based on temperature and pressure from the input and output steam, and based on international technical material.
Any comment:	

B.6.3 Ex-ante calculation of emission reductions:

Project activity emissions consist of carbon dioxide emissions during the co-firing of fuel oil at the black liquor boiler, as discussed in section B.6.1. The formula used to calculate project emissions is:

PE(boiler)y = Qy,fuel * EFy,fuel+ Qy,electricity * EFy

Where:

Qy,fuel Quantity of fuel used in the year "y" (tonnes)
EFy,fuel CO_2 emission factor for the combustion of the fuel (tonnes CO_2 per tonne fuel)
Qy,electricity Quantity of electricity used in the year "y" (MWh)
EFy CO_2 emission factor from electricity generation source. Since the electricity will come from internal sources (The Biomass plant or CRQ) it will be assumed as zero. (tonnes CO_2 per MWh)

The $EF_{y,fuel}$ was calculated based on National specific data (From Brazilian Energy Balance, 2003) and IPCC values.

If at any moment, the electricity consumed in the project activity comes from the grid, the emission factor shall be calculated according the methodology AMS 1.D applicable at the moment of registration.

The average project emissions are:

3 127 Tonnes of CO2e per year

As a 3-year historic steam production from the renewable fuel should be discounted from the baseline total steam production, the baseline emissions are calculated as follows:

BE(boiler)y = (EGbaseline – EGhistoric) * Qhistoric * EFy,fuel

Where

EGbaseline total thermal energy provided by the project activity facility (MWh)
EGhistoric 3-year average of historical thermal energy from renewable source delivered by the existing facility (MWh)
Qhistoric Quantity of fuel that would be used to generate one megawatt-hour based on the 3 years previous to project starting date (ton of fuel/MWh steam).

EFy,fuel CO_2 emission factor for the combustion of the fuel (tonnes CO_2 per tonne fuel)

The average baseline emissions are:

36 457 Tonnes of CO2e per year

As the project activity presents no leakage, emissions reduction is the baseline emissions minus the project emissions, as follows:

ER = BE(boiler)y - PE(boiler)y

The average emission reduction is:

33 330 Tonnes of CO2e per year

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

Table – Forecasted values for each type of emissions.

Years	Estimation of project activity emissions (tonnes of CO2 e)	Estimation of baseline emissions (tonnes of CO2 e)	Estimation of leakage (tonnes of CO2 e)	Estimation of overall emission reductions (tonnes of CO2 e)
2008	36 457	3 127	0	33 330
2009	36 457	3 127	0	33 330
2010	36 457	3 127	0	33 330
2011	36 457	3 127	0	33 330
2012	36 457	3 127	0	33 330
2013	36 457	3 127	0	33 330
2014	36 457	3 127	0	33 330
Total (tonnes of CO_2)	255 201	21 889	0	233 312

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

B.7.1 Data and parameters monitored:

Data / Parameter:	**EGbaseline**
Data unit:	MWh
Description:	Steam produced by CRQ boiler by year
Source of data to be used:	Direct measurements
Value of data	323 000
Description of measurement methods and procedures to be applied:	Measured in tones, and if required, converted to MWh.
QA/QC procedures to be applied:	Steam production data used from process control. All the measuring equipments will be well maintained.
Any comment:	

Data / Parameter:	**Qy,fuel**

Data unit:	tonnes
Description:	Quantity of fuel used in the year "y"
Source of data to be used:	Direct measurements
Value of data	1000
Description of measurement methods and procedures to be applied:	Fuel oil data used from stock control.
QA/QC procedures to be applied:	For consistency assurance it will be double checked by crosschecking with receipts.
Any comment:	No fuel oil consumption is expected.

Data / Parameter:	**Qy,electricity**
Data unit:	MWh
Description:	Quantity of electricity used in the year "y"
Source of data to be used:	Direct measurements
Value of data	3 259
Description of measurement methods and procedures to be applied:	Electricity consumed will be produced on-site.
QA/QC procedures to be applied:	Electricity data used from process control. All the measuring equipments will be well maintained.
Any comment:	

B.7.2 Description of the monitoring plan:

The requirements of the Monitoring Plan are in line with the kind of information routinely collected by similar companies in the sector, thus, internalizing the procedures should be simple and straightforward. If necessary, the Monitoring Plan can be updated and adjusted to meet operational requirements.

All data to be monitored were collected electronically in baseline scenario. The data will be collected and managed by the Quality Assurance management division, known as "Ecoeficiência" sector. The data have been achieved electronically, and data will be kept for the full crediting period, plus two years.

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

The baseline determination and monitoring plan was concluded on 21 august 2006. The entity determining the monitoring methodology and participating in the project as the Carbon Advisor is EcoSecurities Brasil. For further details, contact:

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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:

30/06/2004

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

More than 20 years

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

C.2.1. Renewable crediting period

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

01/07/2007

C.2.1.2. Length of the first crediting period:

7 years

C.2.2. Fixed crediting period:

C.2.2.1. Starting date:

Not applicable

C.2.2.2. Length:

Not applicable

SECTION D. Environmental impacts

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

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

Given that the project activity will not induce significant impacts, no impact assessment was undertaken.

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:

Not applicable.

SECTION E. Stakeholders' comments

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

According to the Resolution #1 dated on December 2nd, 2003, from the Brazilian Inter-Ministerial Commission of Climate Change (Comissão Interministerial de Mudança Global do Clima -CIMGC), decreed on July 7th, 1999[1], any CDM projects must send a letter with description of the project and an invitation for comments by local stakeholders. In this case, letters were sent to the following local stakeholders:

- City Hall of Pindamonhangaba, SP
- Chamber of Pindamonhangaba, SP
- Environment agencies from the State and Local Authority;
- Brazilian Forum of NGOs;
- District Attorney (known in Portuguese as Ministério Público, i.e. the permanent institution essential for legal functions responsible for defending the legal order, democracy and social/individual interests) and;
- Local communities associations.

Local stakeholders were invited to raise their concerns and provide comments on the project activity for a period of 30 days after receiving the letter of invitation. EcoSecurities Ltd. and the Nobrecel addressed questions raised by stakeholders during this period.

E.2. Summary of the comments received:

To date no formal comments have been received from stakeholders.

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

Not applicable, given that no comments were received.

1 Source: http://www.mct.gov.br/clima/comunic/pdf/Resolução01p.pdf

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Project sponsor contact information:

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E-Mail:	nobrecel@nobrecel.com.br
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Represented by:	
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Annex 2

INFORMATION REGARDING PUBLIC FUNDING

This project will not receive any public funding from Annex 1 parties.

Annex 3

BASELINE INFORMATION

Data for emission reduction calculation

Data used for calculations	unit	value
Steam production (EGbaseline-EGhistoric)	MWh	138 789
Amount of fuel oil per MWh	tonne/MWh	0.084
Fuel oil emission factor	ton CO2/ton	3.127
Electricity consumed	MWh	3 259
Electricity emission factor	ton CO2/MWh	0

Annex 4

MONITORING INFORMATION

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