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:

Project title: Koblitz - Piratini Energia S. A - Biomass Power Plant – Small Scale CDM Project (hereafter referred to simply as “Piratini SSC-CDM Project”) – SECOND CREDITING PERIOD

PDD version number: 3

Date (DD/MM/YYYY): 29/01/2010

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

The primary objective of the Piratini Project is to help meet Brazil’s rising demand for energy due to economic growth and to improve the supply of electricity, while contributing to the environmental, social and economic sustainability by increasing renewable energy’s share of the total Brazilian (and the Latin America and the Caribbean region’s) electricity consumption

The project consists in the generation of electricity with a thermoelectric power plant using wood residues from wood processing companies situated mostly in the region of the city of Piratini, in the State of Rio Grande do Sul, Brazil. The power plant, at full capacity, consumes around 100,000 tons of wood residues per year.

The electricity is generated with a high-pressure boiler and a multiple stage condensing steam turbine coupled with a 10 MW_{el} power generator.

For the electric energy output, a Power Purchase Agreement (PPA) with the local power utility (*CEEE* – “*Companhia Estadual de Energia Elétrica do Estado do Rio Grande do Sul*”) is signed, with validity through 2015, with the possibility to be extended until 2017.

A second component of the project is related to the reductions in methane emissions from the wood waste, which, in the absence of the project, would be disposed in a solid waste disposal site, generating methane.

This indigenous and cleaner source of electricity also has an important contribution to environmental sustainability by reducing carbon dioxide emissions that occurs otherwise in the absence of the project. The project activity reduces emissions of greenhouse gas (GHG) by avoiding electricity generation by fossil fuel sources (and CO_2 emissions), which generates (and emits) in the absence of the project.

Better income distribution is derived from this project due to job creation, employees’ salaries and package of benefits such as social security and life insurance, and credits of emission reductions. Additionally, lower expenditure is achieved due to the fact that money will no longer be spent in the same amount to “import” electricity from other regions in the country through the grid. This money stays in the region and is used for providing the population better services which improves the availability of basic needs. This surplus of capital can be translated in investments in education and health that directly benefits the local population and indirectly in a more equitable income distribution.

A.3. Project participants:

Detailed contact information on party(ies) and private/public entities involved in the project activity is listed in Annex 1.

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)	Private entity: *Piratini Energia S.A.*	No
Japan	Private entity: *Sumitomo Mitsui Banking Corporation*	No
	Private entity: *The Chugoku Electric Power Co., Inc.*	
United Kingdom of Great Britain and Northern Ireland	Private entity: *Toray International U.K. Ltd*	No
	Private entity: *Deutsche Bank AG*	No
(*) In accordance with the CDM modalities and procedures, at the time of making the CDM-PDD public at the stage of validation, a Party involved may or may not have provided its approval. At the time of requesting registration, the approval by the Party(ies) involved is required.		

Table 1 – Party(ies) and private/public entities involved in the project activity

Credit owner and project operator, the special purpose company *Piratini Energia S.A.*, is author and the responsible for all activities related to the project management, registration, monitoring, measurement and reporting.

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

Biomass power conversion technologies for electricity production can be broadly categorized into direct combustion technologies, gasification technologies, and pyrolysis. Direct combustion technologies, as applied in the Piratini facility are the most widely known option for simultaneous power generation and heat production from biomass. It involves the oxidation of biomass with excess air in a process that yields hot flue gases that are used to produce steam in boilers. The steam is used to produce electricity in a Rankine cycle Steam Turbine. The Rankine cycle is a heat engine with a steam power cycle. The working fluid is water. Typically, electricity is only produced in a “condensing” steam cycle, while electricity and steam are co-generated in an “extracting” steam cycle.

The technology and equipment used in the project were developed and manufactured locally and has been successfully applied to similar projects in Brazil and around the world.

The project will use wood-processing residues from sustainable renewable sources as a fuel to power the thermal facility through a high-pressure boiler and a multiple stage condensing steam coupled with a power generator.

Specification of the main equipments follows:

- Acqua tubular boiler, manufactured in 2001 by *Equipalcool Sistemas Ltda*., model 50-V-2-S, serial number 050/00. Operating conditions, pressure, *42 kgf/cm^2*; steam temperature, *440 ± 10 °C*; steam production *50,000 kg/h* (maximum *55,000 kg/h*); feed water at 45 kgf/cm^2 and *110 ± 10 °C*; fuel, wood residues.
- Multiple stage condensing steam turbine with 3 points of extraction, manufactured in 1973 by *Westinghouse*, retrofitted in 2001 by *Engeturb Turbinas a Vapor Ltda.* Operating conditions, steam input pressure, 42 *kgf/cm^2* and *440 °C*; exhaust condensate at *0.083 kgf/cm^2* and *46 °C.*
- The turbo-generator manufactured in 1973 by *Westinghouse*, retrofitted in 2001 by *Engeturb Turbinas a Vapor Ltda.*, installed power *10,000 kW$_{el}$* (*12,500 kVA*), *3,600 rpm*, *60 Hz*, *13.8 kV*.

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

A.4.1.1. Host Party(ies):

Brazil.

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

State of Rio Grande do Sul.

A.4.1.3. City/Town/Community etc:

Piratini.

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

The project is located in the city of Piratini, state of Rio Grande do Sul, South region of Brazil (Figure 1).

Piratini is a city with 20,225 inhabitants, 3,561 km² of territorial extension a GDP per capita of BRL 5,075 (IBGE, 2008).

Piratini geographical coordinates are: latitude 31º 26' 53'' South, longitude 53º 06' 15'' West.

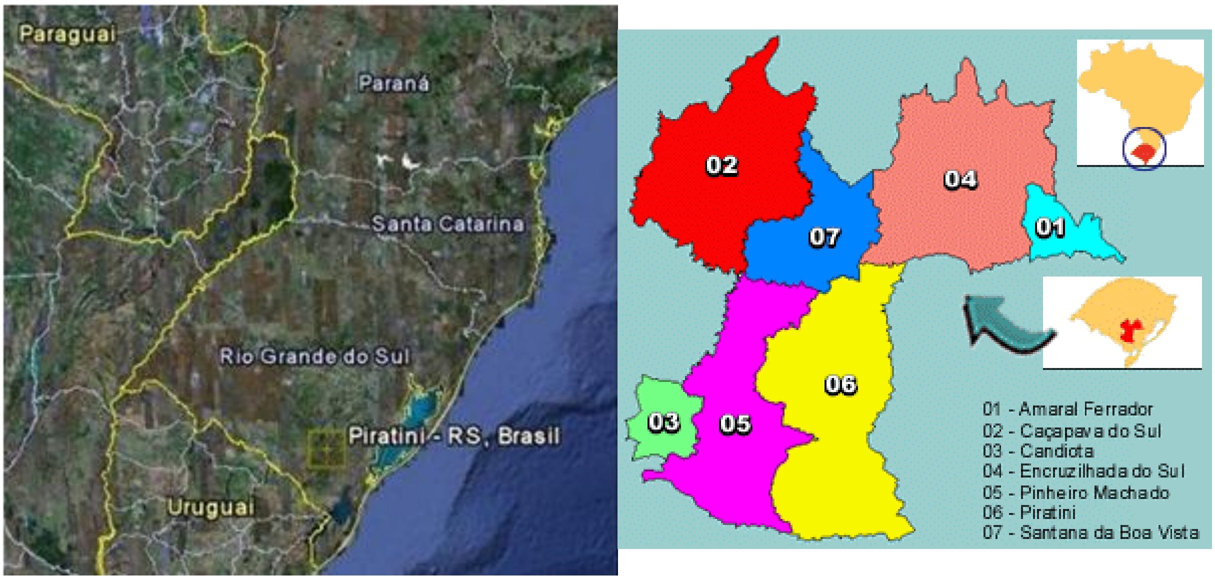


Figure 1 – Partial map of South America showing the State of Rio Grande do Sul and, on the right side, the Piratini municipality (source: www.citybrazil.com.br)

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

Small-scale project activity.

Component 1, power-generation: scope 1, energy industries (renewable-/non-renewable sources), type I.

Component 2, methane-emissions-avoidance: scope 13, waste handling and disposal, type III.

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

Years	**Annual estimation of emission reductions in tonnes of CO_2e**
2009 (starting on February 1st)	4,830
2010	8,714
2011	13,807
2012	20,497
2013	28,738
2014	38,484
2015	49,691
2016 (until January 31st)	5,193

Total estimated reductions (tonnes of CO_2e)	**169,954**
Total number of crediting years	7
Annual average over the crediting period of estimated reductions (tonnes of CO2e)	**24,279**

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

This project does not receive any public funding and it is not a diversion of ODA.

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

According to Appendix C of the Simplified Modalities and Procedures for Small-Scale CDM project activities, debundling is defined as the fragmentation of a large project activity into smaller parts.

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.

Since the project activity does not correspond to any of the above-mentioned points, it shall be considered as a small scale CDM project activity.

The PPs confirms that none of the above mentioned conditions is applicable to the 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:

Component 1, power-generation:

- AMS - I.D – Grid connected renewable electricity generation (version 13), EB36.

- Tool to calculate the emission factor for an electricity system (version 1.1), EB35.

Component 2, methane-emissions-avoidance:

- AMS III.E – Avoidance of methane production from decay of biomass through controlled combustion, gasification or mechanical/thermal treatment (version 15.1), EB36.

- Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site (version 04), EB 41.

- Attachment C of appendix B - General guidance on leakage in biomass project activities, version 02.

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

Piratini Project is a small scale project activity and falls under the categories I.D and III.E according to the Appendix B of the Simplified Modalities and Procedures for Small-Scale CDM project activities. Both components (power generation and methane emissions avoidance) are eligible under the simplified procedures for small-scale CDM project activities.

For component 1, the power plant has 10 MW of nominal installed capacity (below the eligibility limit of 15 MW).

From AMS I.D: "*If the unit added has both renewable and non-renewable components (e.g.. a wind/diesel unit), the eligibility limit of 15MW for a small-scale CDM project activity applies only to the renewable component. If the unit added co-fires fossil fuel1, the capacity of the entire unit shall not exceed the limit of 15MW*". Considering the General Guidance to SSC CDM methodologies: "*For biomass, biofuel and biogas project activities, the maximal limit of 15MW(e) is equivalent to 45 MW thermal output of the equipment or the plant (e.g. boilers). For thermal applications of biomass, biofuels or biogas (e.g., the cookstoves), the limit of 45 MWth is the installed/rated capacity of the thermal application equipment or device/s (e.g. biogas stoves). For electrical or mechanical applications, the limit of 15 MW installed/rated output shall be used. In case of co-firing renewable and fossil fuels, the rated capacity of the system when using fossil fuel shall apply*".

This project complies with the applicability criteria of AMS-III.E, as shown below:

1. This project category comprises measures that avoid the production of methane from biomass or other organic matter that would have otherwise been left to decay under clearly anaerobic conditions throughout the crediting period in a solid waste disposal site without methane recovery;

2. Due to the project activity, decay of the wastes is prevented through controlled combustion;

3. For the methane emissions component, annual emissions reductions from the project activity are limited to 60,000 tCO_2e.

B.3. Description of the project boundary:

According to the chosen methodology AMS-III.E, the project boundary is the physical, geographical sites:

(a) Where the solid waste would have been disposed or is already deposited and the avoided methane emission occurs in absence of the proposed project activity.

(b) Where the treatment of biomass through controlled combustion, gasification or mechanical/thermal treatment takes place.

(c) Where the final residues of the combustion process will be deposited (this parcel is only relevant to controlled combustion activities).

(d) And in the itineraries between them, where the transportation of wastes and combustion residues and/or residues of gasification and mechanical/thermal treatment process occurs.

However, the Simplified modalities and procedures for small–scale clean development mechanism project activities further explain: The project boundary shall encompass all anthropogenic emissions by sources of greenhouse gases (GHG) under the control of the project participants that are reasonably attributable to the small-scale CDM project activity.

The proposed project activity is a special purpose company dedicated to electricity generation from renewable wood residues. The project activity is responsible for the biomass residues burned in the power plant.

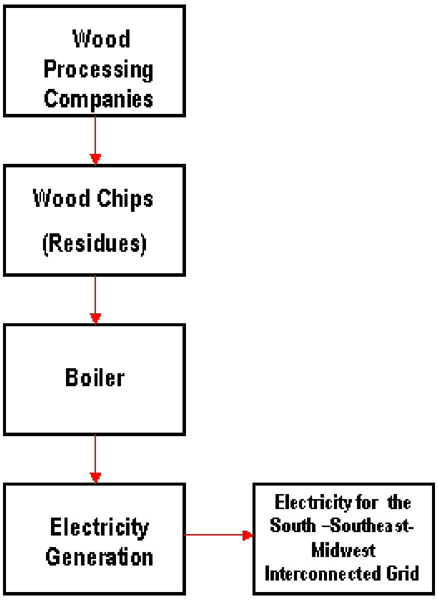


Figure 2 - Project Boundary

B.4. Description of baseline and its development:

The project, a greenhouse (GHG) gas-free power generation project activity, results in GHG emissions reductions as the result of the displacement of generation from fossil-fuel thermal plants that has otherwise been delivered to the South-Southeast-Midwest interconnected grid.

For the renewable energy generation component, the emission reductions by the project activity (ER_y) during a given year y are the product of the baseline emissions factor (EF_y, in tCO_2e/MWh) times the electricity supplied by the project to the grid (EG_y, in MWh). According to the "*Tool to calculate the emission factor for an electricity system"* (version 1.1), the emission factor is calculated as a combined margin, consisting of the operating margin and the build margin of the relevant electricity system.

For the purpose of the emission factor calculation Brazilian DNA has published the Resolution nr. 8 issued on 26th May, 2008 that defines the Brazilian Interconnected Grid as a single system that covers all the five macro-geographical regions of the country (North, Northeast, South, Southeast and Midwest). Also, the DNA made available the operating margin and build margin factors. Hence, Brazilian DNA information will be used to calculate the baseline emission factor of the grid.

The project activity also avoids the methane emissions given that the biomass used for electricity generation would otherwise be disposed with controlled placement, generating methane. This component will use the baseline listed in Type III.E, as defined in Appendix B of the simplified modalities and procedures for small-scale CDM project activities.

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:

For the second crediting period, project participants are required to evaluate the possible impact of new relevant national and/or sectoral policies and circumstance on the baseline scenario.

There are no new relevant national and/or sectoral policies and circumstances in this sector, in comparison to the time of the Project's start, which could alter the baseline scenario at the time of requesting renewal of crediting period. As shown in the editorial of one of the main Brazilian newspaper, Folha de S. Paulo, on 10/01/2008[1]: "*Energy conservation program (Procel) and Renewable sources program (Proinfa) are little more than just 'ecologically correct window dressing'. There is little use from the wind energy potential in Brazilian Northeast region as well as from the energy generation with biomass (sugarcane bagasse) in Brazilian Southeast region, because of lack of regulation and compensating prices. There is a lot to be done*".

An article written in 2004 by two professors of Energy Planning at the Universidade Federal do Rio de Janeiro analyzes Brazilian energy regulations and identifies four fragilities that can undermine their suitable implementation[2]. Those fragilities refer to:

1) The guarantee of the purchase of electricity. Some points are still to be clarified, regarding:

   a) Minimum and maximum limits for the purchase of energy;
   b) the possibility of the ONS - Electrical System Operator to determine production increase or decrease, depending on the demand variation;

---

[1] http://www1.folha.uol.com.br/fsp/opiniao/fz1001200801.htm

[2] http://www.seeds.usp.br/pir/arquivos/congressos/CBPE2004/Artigos/PROINFA%20E%20CDE%20-%20QUESTIONAMENTOS%20SOBRE%20A%20LEGISLA%C7%C3O%20E%20REGULA.pdf

c) Payment for the availability of production capacity, in periods when there is abundant energy offer.

2) The definition of the role of the three different regulatory agents: MME – Ministry of Mines and Energy, ANEEL - Brazilian power regulatory agency - *Agência Nacional de Energia Elétrica* and Eletrobrás – Brazilian Electricity Company – *Centrais Elétricas Brasileiras*. There are coordinated functions among the three agents, what leads to investor's insecurity, because they have three different interlocutors, instead of one.

3) Juridical problems in the public calls legislation. Some rules are not totally compatible with the legislation, what might even lead to contract annulations.

4) The way the energy price is presently established, through the calculation of an average price for each type of energy source, penalizes projects with a lower cost-benefit rate. The authors suggest that the prices should be set according to the characteristics of each project.

There is a rising demand for energy in Brazil, but it is not being attended by biomass plants. In the most recent energy auctions in Brazil, the results were the following: in an auction which took place on July 26, 2007, there was in an increase of 1.781,8 MW into National Electric System, all of them from oil thermo plants[3]; in an auction which took place on October 16, 2007, there was in an increase of 4,353 MW into National Electric System, from which 69% originated from fossil fuel (oil, coal and natural gas) plants[4].

In the energy auction for alternative energy sources, that took place on June 18, 2007, 2,803 MW were qualified, but only 638.64 MW were negotiated[5], what shows the lack of interest by most of the participants, due to the price and conditions presented. From the estimated 2,000 to 3,000 MW available from sugarcane bagasse plants, only 542 MW were sold.

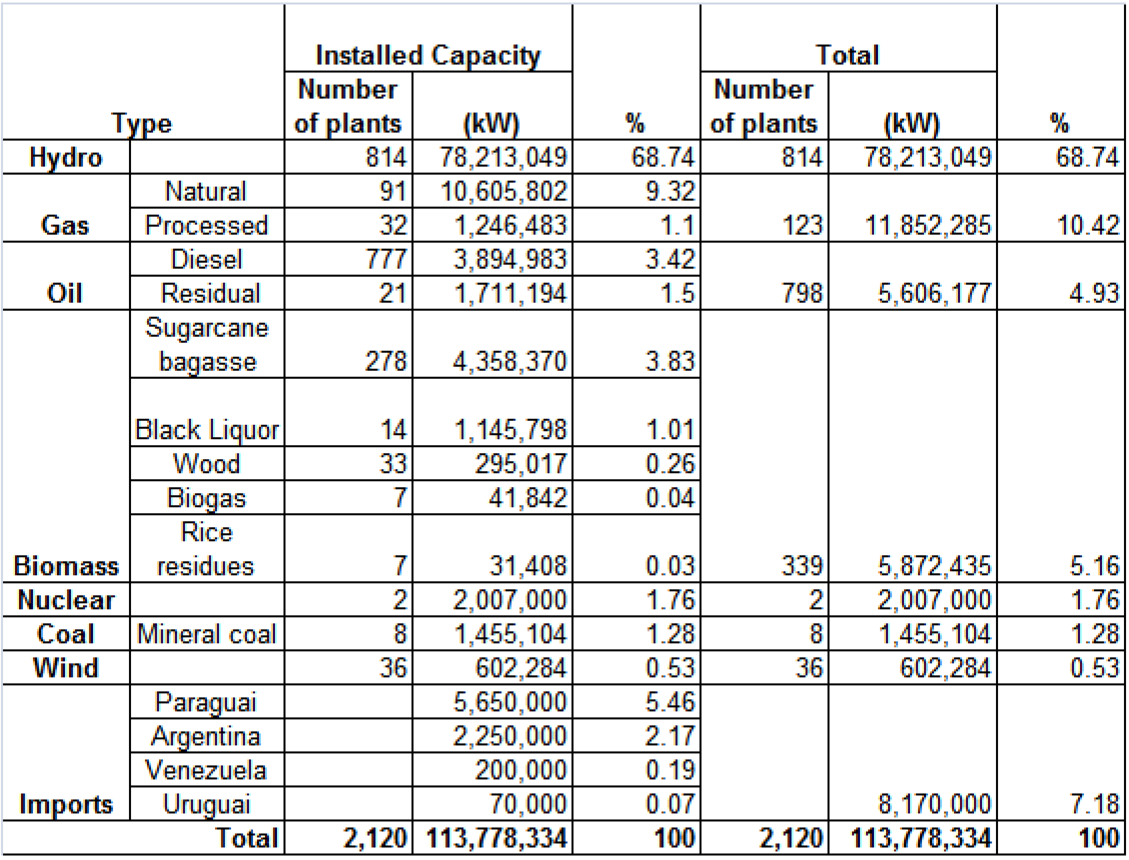
Due to the barriers mentioned above, the generation of electrical energy from wood biomass represents only 0.26% of the total generation of electricity in Brazil (see table below).

---

[3] Source: http://www.epe.gov.br/Lists/LeilaoA32007/DispForm.aspx?ID=44

[4] Source: Folha de S. Paulo, 17/10/2007, http://www1.folha.uol.com.br/fsp/dinheiro/fi1710200730.htm

[5] Source: http://www.epe.gov.br/PressReleases/20070618_1.pdf

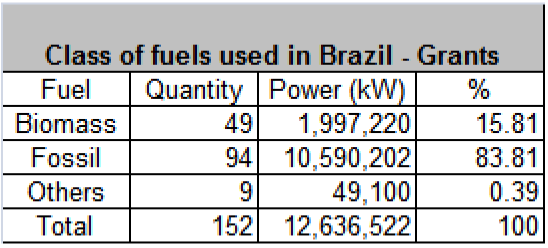


		Installed Capacity			Total		
Type		**Number of plants**	**(kW)**	**%**	**Number of plants**	**(kW)**	**%**
Hydro		814	78,213,049	68.74	814	78,213,049	68.74
Gas	Natural	91	10,605,802	9.32	123	11,852,285	10.42
	Processed	32	1,246,483	1.1			
Oil	Diesel	777	3,894,983	3.42	798	5,606,177	4.93
	Residual	21	1,711,194	1.5			
Biomass	Sugarcane bagasse	278	4,358,370	3.83	339	5,872,435	5.16
	Black Liquor	14	1,145,798	1.01			
	Wood	33	295,017	0.26			
	Biogas	7	41,842	0.04			
	Rice residues	7	31,408	0.03			
Nuclear		2	2,007,000	1.76	2	2,007,000	1.76
Coal	Mineral coal	8	1,455,104	1.28	8	1,455,104	1.28
Wind		36	602,284	0.53	36	602,284	0.53
Imports	Paraguai		5,650,000	5.46		8,170,000	7.18
	Argentina		2,250,000	2.17			
	Venezuela		200,000	0.19			
	Uruguai		70,000	0.07			
	Total	**2,120**	**113,778,334**	**100**	**2,120**	**113,778,334**	**100**

Operating Plants, as of 19/10/2009

Source: http://www.aneel.gov.br/aplicacoes/capacidadebrasil/OperacaoCapacidadeBrasil.asp

This trend is about to continue, as shown by the huge difference between biomass thermal plants and fossil fuel plants power capacity granted by ANEEL, as of 19/10/2009:



Class of fuels used in Brazil - Grants			
Fuel	Quantity	Power (kW)	%
Biomass	49	1,997,220	15.81
Fossil	94	10,590,202	83.81
Others	9	49,100	0.39
Total	152	12,636,522	100

The only sectoral policy/program release in the period was the Proinfa Program. Law # 10,438 dated April 26th, 2002[6], created PROINFA (from the Portuguese "Programa de Incentivo às Fontes Alternativas de Energia Elétrica", in a free translation, Alternative Electricity Sources Incentive

---

[6] Available at: http://www.eletrobras.com/elb/data/Pages/LUMISABB61D26PTBRIE.htm#Legislação.

Program). Brazilian Decree # 5,025 dated March 30th, 2004, which regulates the Law nr. 10,438, states that PROINFA aims for the reduction of greenhouse gases as established by the United Nations Framework Convention on Climate Change (UNFCCC) under Kyoto Protocol, contributing to the sustainable development. Therefore, the program is clearly a "Type E-" policy.

B.6. Emission reductions:

B.6.1. Explanation of methodological choices:

For the component 1, power-generation:

The emission reduction of the electricity generation is simply emissions in the baseline scenario (BE_y, in tCO_2e), i.e., the annual electricity supplied to the grid (EG_y, in MWh) times the baseline emission factor of the grid.

$$BE_y = EG_y \times EF_y$$

According to the selected approved methodology (AMS.I-D, version 13), the baseline emission factor (EF_y) is calculated using the methodological tool "Tool to calculate the emission factor for an electricity system" (version 1.1).

The Brazilian DNA made available the operating margin emission factor calculated using option c, of this tool: dispatch data analysis OM. The Brazilian DNA has published the resolution number 8, issued on 26/05/2008, which defines the Brazilian Interconnected Grid as a single system**,** which covers all the five macro-geographical regions of the country (North, Northeast, South, Southeast and Midwest). More information of the methods applied can be obtained in the DNA's website (http://www.mct.gov.br/index.php/content/view/72764.html) and vintage will be used in the project activity.

The baseline emission factor of the grid for this project will be estimated based on the values for build margin and operating margin presented by the Brazilian DNA for 2007, since no complete data for 2008 were available in the beginning of 2009 (see at http://www.mct.gov.br/index.php/content/view/74691.html).

The combined margin is calculated as follows:

$$EF_y = w_{OM} \cdot EF_{OM,y} + w_{BM} \cdot EF_{BM,y}$$

Where weights are w_{OM} = 0.25 and w_{BM} = 0.75, for the second crediting period.

For the component 2, methane-emissions-avoidance (AMS-III.E, version 15.1):

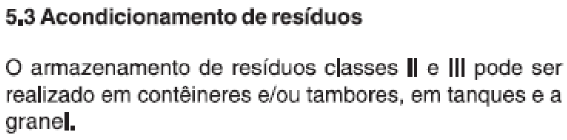
The project activity combusts only freshly generated wastes. There are no methane emissions to be removed to comply with national or local safety requirement or legal regulations.

Regarding the final disposition of wood processing industries (sawmills), the following is based on official documents[7] and private communications with the Rio Grande do Sul Environmental Agency[8]. Sawmills in the regions would have the following alternative to manage wood residues: a) final disposition in municipal landfills; b) final disposition in industrial landfills; c) Final disposition in licensed specific disposal facilities; d) incineration; e) open field burning and f) disposition in open field stockpiles. From the five alternatives, only (c)[9] would be applicable in the region[10].

FEPAM (http://www.fepam.rs.gov.br/consema/Res_009-2000_Nor_Tec_An.asp) recommends the use of ABNT Brazilian Standards NBR 10.004 and NBR 11.174, regarding the final disposition of solid residues in licensed specific disposal facilities. *NBR 10.004 - Classificação de Resíduos Sólidos* (Classification of Solid Waste) classifies the types of residues. According to it, wood residues are non dangerous and are classified as class II (non inert – because they are combustible). Residues Class II must be disposed according to *NBR 11.174 – Armazenamento de Resíduos Classe II – Não Inertes e III – Inertes* (Storage of Waste Class II – Non Inert and III- Inert).

Regarding the disposition of the residues, NBR 11.174 states that waste must be directed to specific deposition areas and stored in containers and/or drums. This is an anaerobic managed solid waste disposal, with controlled placement, which includes: (i) material coverage; (ii) mechanical compacting; (iii) control of scavenging; (iv) levelling of the waste; (v) fire control.

See below the reproduction of parts of the original NBR 11.174, in Portuguese, with a translation into English below, as evidence of the above written:



5.3 Acondicionamento de resíduos

O armazenamento de resíduos classes II e III pode ser realizado em contêineres e/ou tambores, em tanques e a granel.

Translation: storage of class II and III residues can be done in containers and/or drums, in tanks and in pulk.

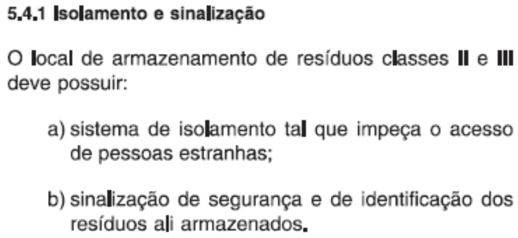
---

[7] *Inventário Nacional de Resíduos Sólidos Industriais – Etapa Rio Grande do Sul* (FEPAM, 2002), and *Relatório sobre a Geração de Resíduos Sólidos Industriais no Estado do Rio Grande do Sul* (FEPAM, 2003).

[8] *Fundação Estadual de Proteção Ambiental Henrique Luis Roessler*, FEPAM (URL: http://www.fepam.rs.gov.br/).

[9] The environmental body of the state of Rio Grande do Sul released in April 1, 1998, decree number 38.356, allows the disposition of some specific solid residues, for example, wood-processing industry residues, in licensed disposal facilities under the observance of special requirements, which includes preparing and monitoring the soil to avoid contamination.

[10] Consema Federal Resolution 073/2004 prohibits the disposition in municipal landfills (option a). Rio Grande do Sul State Decree 38.356/1998 banned open field burning (alternative e). Alternative “f” does not comply with FEPAM legislation and Brazilian Standards NBR 10.004 and NBR 11.174. Alternatives “b” and “d” are not economically feasible due to either the cost of treatment (incineration) or transportation (the closest industrial landfill is located in Pelotas, around 120 km away, 100 km of paved roads plus 20 km of unpaved roads).



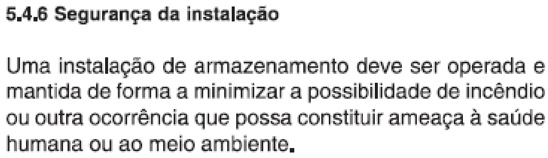
5.4.1 Isolamento e sinalização

O local de armazenamento de resíduos classes II e III deve possuir:

a) sistema de isolamento tal que impeça o acesso de pessoas estranhas;

b) sinalização de segurança e de identificação dos resíduos ali armazenados.

Translation: The local of storage for class II and II residues must have: a) isolation system to block people’s access; b) safety signalization and identification of sstored residues.



5.4.6 Segurança da instalação

Uma instalação de armazenamento deve ser operada e mantida de forma a minimizar a possibilidade de incêndio ou outra ocorrência que possa constituir ameaça à saúde humana ou ao meio ambiente.

Translation: A storage installation must be operated and kept so that the possibility of fire or any other threat to human health or to the environment is minimized.

In this way, the baseline scenario is to comply with local legislation: FEPAM (http://www.fepam.rs.gov.br/consema/Res_009-2000_Nor_Tec_An.asp) and Brazilian Standards NBR 10.004 and NBR 11.174. Some sawmills in the region of the city of Rio Grande are not operating because they could not comply with this legislation. The sawmills of this region which sell wood residues to Usina Piratini declared that they would have no other destination for the residues which are sold to the Project. Besides, Usina Piratini is the only buyer of wood residues in the region of the city of Piratini. Hence, 100% of the residues used by the Project would have been disposed in a solid waste disposal site without methane recovery and would decay anaerobically in the disposal site throughout the crediting period, in the absence of the Project. Anyway, according to the DOE’s orientation, and for conservativeness reasons, PPs will consider that the baseline scenario is the disposition in open field stockpiles, which was the common practice before the implementation of the project.

Under these conditions, the baseline emissions at any year “y” during the crediting period is calculated using the amount and composition of wastes combusted, since the beginning of the project activity (year “x=1”) up to the year “y”, using the first order decay model as referred to in the “Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site”.

The formula used is:

$$BE_y = BE_{CH4,SWDS,y}$$ **Equation 1**

Where,

BE_y	Baseline emissions at year “y” during crediting period (tCO_2e)
$BE_{CH4,SWDS,y}$	Yearly Methane Generation Potential of the wastes diverted to be disposed in the disposal site from the beginning of the project (x=1) up to the year “y”,

calculated according to the “Tool to determine methane emissions avoided from disposal waste at a solid waste disposal site” (version 04) (tCO_2e).

According to the above mentioned tool:

$$BE_{CH4,SWDS,y} = \varphi \cdot (1-f) \cdot GWP_{CH4} \cdot (1-OX) \cdot \frac{16}{12} \cdot F \cdot DOC_f \cdot MCF \cdot \sum_{x=1}^{y} \sum_{j} W_{j,x} \cdot DOC_j \cdot e^{-k_j \cdot (y-x)} \cdot (1-e^{-k_j}) \qquad \textbf{Equation 2}$$

Where:

$BE_{CH4,SWDS,y}$	Methane emissions avoided during the year y from preventing waste disposal at the solid waste disposal site (SWDS) during the period from the start of the project activity to the end of the year y (tCO2e)
φ	Model correction factor to account for model uncertainties
f	Fraction of methane captured at the SWDS and flared, combusted or used in another manner
GWP_{CH4}	Global Warming Potential (GWP) of methane, valid for the relevant commitment period
OX	Oxidation factor (reflecting the amount of methane from SWDS that is oxidized in the soil or other material covering the waste)
F	Fraction of methane in the SWDS gas (volume fraction)
DOC_f	Fraction of degradable organic carbon (DOC) that can decompose
MCF	Methane correction factor
$W_{j,x}$	Amount of organic waste type j prevented from disposal in the SWDS in the year x (tons)
DOC_j	Fraction of degradable organic carbon (by weight) in the waste type j
k_j	Decay rate for the waste type j (0.02 for wood and wood products)
j	Waste type category (index)
x	Year during the crediting period: x runs from the first year of the first crediting period (x = 1) to the year y for which avoided emissions are calculated (x = y)
y	Year for which methane emissions are calculated

For $W_{j,x}$, the following equation is used at the time of the project verification:

$$W_{j,x} = W_x \cdot \frac{\sum_{n=1}^{z} p_{n,j,x}}{z} \qquad \textbf{Equation 3}$$

Where:

$W_{j,x}$	Amount of organic waste type j prevented from disposal in the SWDS in the year x (tons)
W_x	Total amount of organic waste prevented from disposal in year x (tons)
$p_{n,j,x}$	Weight fraction of the waste type j in the sample n collected during the year x
z	Number of samples collected during the year x

Leakage

1) Methodology AMS-III.E states that if the controlled combustion technology is equipment transferred from another activity or if the existing equipment is transferred to another activity, leakage effects at the site of the other activity are to be considered. The turbo-generator used in the project plant came from a fuel oil thermo power plant which was switched off by another company (*Centrais Elétricas do Norte do Brasil S/A - Eletronorte*) in Manaus, Amazonas. As this thermo plant used to operate with fuel oil, no emission increase was caused.

Above and beyond, it must be clearly understood that the shutdown of the thermo power plant was not caused by the conception of the project activity. Also, the project activity bought a turbo-generator with specified technical specifications but, of course, with no influence to specify from where it should come from. Then, no net change of anthropogenic emissions of greenhouse gases which occurs outside the project boundary and which is measurable and reasonably attributable to the CDM project activity exists. Hence, there is no leakage in this case. (Note: this is the same text used in the PDD of the first crediting period).

2) According to “Indicative Simplified Baseline and Monitoring Methodologies for Selected Small-Scale CDM Project Activity Categories”, potentially significant sources of leakage and project emissions for renewable biomass projects must be identified in the following situations:

A. Shifts of pre-project activities. Decreases of carbon stocks, for example as a result of deforestation, outside the land area where the biomass is grown, due to shifts of pre-project activities.

B. Emissions related to the production of the biomass.

C. Competing uses for the biomass. The biomass may in the absence of the project activity be used elsewhere, for the same or a different purpose.

A and B do not apply for this project, since there were no pre-project activities which used the wood residues, nor there are additional emissions to produce the wood residues because of the project activity. Regarding competing uses for the biomass, the project uses biomass residues from the region of the city of Piratini. All the biomass residues produced in the region are used by the project activity. The City Hall of Piratini declared (copy of the document under request), that the project activity is the only consumer of biomass residues in the city, so that there is no surplus of biomass in the region of the project activity, which is not utilized. The project activity also purchased, in the first crediting period, a small amount of residues from wood producers located in the city of Rio

Grande, 190 km away from the plant. These producers declared (copy under request) that the project activity uses 50% of their wood residues and that there would be no other uses for these residues, in the absence of the project activity.

Hence, there is no leakage due to the project activity.

Project emissions

For project emissions calculation, the following formula is used:

$$PE_y = PE_{y,com} + PE_{y,\ transp} + PE_{y,\ power}$$

Equation 4

Where:

$PE_{y,comb}$	Emissions through combustion and gasification of non-biomass carbon of waste and RDF/SB in the year "y"(tCO_2e)
$PE_{y,transp}$	Emissions through incremental transportation in the year "y"(tCO_2e)
$PE_{y,power}$	Emissions through electricity or diesel consumption in the year "y"(tCO_2e)

$PE_{y,comb}$ and $PE_{y,power}$ are zero. There is no consumption of non biomass waste nor from auxiliary fossil fuels. Neither there is consumption of electricity generated outside the project plant or from diesel.

In this way, $PE_y = PE_{y,\ transp}$

$PE_{y,transp}$ calculation is given through the formula below:

$$PE_{y,transp} = \left(Q_y / CT_y\right) * DAF_w * EF_{CO2} + \left(Q_{y,ash} / CT_{y,ash}\right) * DAF_{ash} * EF_{CO2} + \left(Q_{y,RDF/SB} / CT_{y,RDF/SB}\right) * DAF_{RDF/SB} * EF_{CO2}$$

Equation 5

Where:

Q_y	Quantity of waste combusted, gasified or mechanically/thermally treated in the year "y" (tonnes)
CT_y	Average truck capacity for waste transportation (tonnes/truck)
DAF_w	Average incremental distance for waste transportation (km/truck)
EF_{CO2}	CO_2 emission factor from fuel use due to transportation (tCO_2/km, IPCC default values or local values)

$Q_{y,ash}$	Quantity of combustion and gasification residues and residues from mechanical/thermal treatment produced in the year "y" (tonnes)
$CT_{y,ash}$	Average truck capacity for residues transportation (tonnes/truck)
DAF_{ash}	Average distance for residues transportation (km/truck)
$Q_{y,RDF/SB}$	Quantity of RDF/SB produced in the year "y" (tonnes)
$CT_{y,RDF/SB}$	Average truck capacity for RDF/SB transportation (tonnes/truck)
$DAF_{RDF/SB}$	Aggregate average distance for RDF/SB transportation to the storage in the production site as well as to the end user sites (km/truck)

For this project, $Q_{y,ash}$, $CT_{y,ash}$, $Q_{y,RDF/SB}$, $CT_{y,RDF/SB}$, and $DAF_{RDF/SB}$ are zero.

In this way,

$$PE_{y,transp} = \left(Q_y / CT_y\right) * DAF_w * EF_{CO2}$$

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

Data / parameter:	φ
Data unit:	-
Description:	Model correction factor to account for model uncertainties
Source of data used:	Methodological tool: "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site (Version 04)"
Value applied:	0.9
Justification of the choice of data or description of measurement methods and procedures actually applied :	The data used is in accordance with the methodological tool, recommended at paragraph 4 of AMS III.E.
Any comment:	Oonk et el. (1994) have validated several landfill gas models based on 17 realized landfill gas projects. The mean relative error of multi-phase models was assessed to be 18%. Given the uncertainties associated with the model and in order to estimate emission reductions in a conservative manner, a discount of 10% is applied to the model results.

Data / parameter:	OX
Data unit:	-

Description:	Oxidation factor (reflecting the amount of methane from SWDS that is oxidized in the soil or other material covering the waste)
Source of data used:	Conduct a site visit at the solid waste disposal site in order to assess the type of cover of the solid waste disposal site. Use the IPCC 2006 Guidelines for National Greenhouse Gas Inventories for the choice of the value to be applied.
Value applied:	0.
Justification of the choice of data or description of measurement methods and procedures actually applied :	The data used is in accordance with the methodological tool ("Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site (Version 04)") recommended at paragraph 4 of AMS III.E.
Any comment:	Use 0.1 for managed solid waste disposal sites that are covered with oxidizing material such as soil or compost. Use 0 for other types of solid waste disposal sites.

Data / parameter:	F
Data unit:	-
Description:	1. Fraction of methane in the SWDS gas (volume fraction)
Source of data used:	IPCC 2006 Guidelines for National Greenhouse Gas Inventories
Value applied:	0.5
Justification of the choice of data or description of measurement methods and procedures actually applied :	The data used is in accordance with the methodological tool ("Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site (Version 04)") recommended at paragraph 4 of AMS III.E.
Any comment:	This factor reflects the fact that some degradable organic carbon does not degrade, or degrades very slowly, under anaerobic conditions in the SWDS. A default value of 0.5 is recommended by IPCC.

Data / parameter:	DOC_f
Data unit:	-
Description:	Fraction of degradable organic carbon (DOC) that can decompose
Source of data used:	IPCC 2006 Guidelines for National Greenhouse Gas Inventories
Value applied:	0.5
Justification of the choice of data or description of measurement methods and procedures actually	The data used is in accordance with the methodological tool ("Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site (Version 04)") recommended at paragraph 4 of AMS III.E.

applied :	
Any comment:	

Data / parameter:	MCF
Data unit:	-
Description:	Methane correction factor
Source of data used:	IPCC 2006 Guidelines for National Greenhouse Gas Inventories
Value applied:	0.28
Justification of the choice of data or description of measurement methods and procedures actually applied :	The data used is in accordance with the paragraph 22 of AMS III.E.
Any comment:	

Data / parameter:	DOC_j
Data unit:	-
Description:	Fraction of degradable organic carbon (by weight) in the waste type *j*
Source of data used:	IPCC 2006 Guidelines for National Greenhouse Gas Inventories (adapted from Volume 5, Tables 2.4 and 2.5)
Values applied:	Apply the following value for wet wood waste type:
Justification of the choice of data or description of measurement methods and procedures actually applied :	The data used is in accordance with the methodological tool (“Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site (Version 04)”) recommended at paragraph 4 of AMS III.E.
Any comment:	

Waste type	**DOC (% wet waste)**
Wood and wood products	43

Data / parameter:	k_j
Data unit:	-
Description:	Decay rate for the waste type *j*
Source of data used:	IPCC 2006 Guidelines for National Greenhouse Gas Inventories (adapted from Volume 5, Table 3.3)
Values applied:	0.03.

<table>
<tr><td></td><td>
<table>
<tr><th colspan="2" rowspan="2">Waste type <i>j</i></th><th colspan="2">Boreal and Temperate (MAT≤20°C)</th><th colspan="2">Tropical (MAT>20°C)</th></tr>
<tr><th>Dry (MAP/PET <1)</th><th>Wet (MAP/PET >1)</th><th>Dry (MAP< 1000mm)</th><th>Wet (MAP> 1000mm)</th></tr>
<tr><td>Slowly degrading</td><td>Wood, wood products and straw</td><td>0.02</td><td>0.03</td><td>0.025</td><td>0.035</td></tr>
</table>
NB: MAT – mean annual temperature, MAP – Mean annual precipitation, PET – potential evapotranspiration. MAP/PET is the ratio between the mean annual precipitation and the potential evapotranspiration.</td></tr>
<tr><td>Justification of the choice of data or description of measurement methods and procedures actually applied :</td><td>The data used is in accordance with the methodological tool (“Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site (Version 04)”) recommended at paragraph 4 of AMS III.E.</td></tr>
<tr><td>Any comment:</td><td>Document in the CDM-PDD the climatic conditions at the SWDS site (temperature, precipitation and, where applicable, evapotranspiration). Use long-term averages based on statistical data, where available. Provide references. See justification (calculation of the rate MAP/PET) for the use the value 0.03 in section B.6.3 and in annexed spreadsheet “Piratini_Second Period_CERs estimation_revalidation_2009.11.17.xls”.</td></tr>
</table>

Data / parameter:	CT_y
Data unit:	Tonnes/truck
Description:	Average truck capacity for waste transportation
Source of data used:	Usina Piratini
Value applied:	20 tonnes
Justification of the choice of data or description of measurement methods and procedures actually applied :	The trucks used to the biomass transportation are identified by license number, driver and biomass type. They are weighted at the entrance, full loaded, and weighted again after unloading the biomass at the exit of the power plant.
Any comment:	

Data / parameter:	EF_{CO2}
Data unit:	CO_2 emission factor from fuel use due to transportation
Description:	tCO_2/km
Source of data:	IPCC default values

Value applied:	Diesel E.F: 74,100 kg CO2/TJ (IPCC) Diesel NCV: 43 MJ/kg (IPCC) = 36.12 MJ/liter Diesel density: 0.84 kg/l (IEA) Resulting in: Diesel NCV = 36.12 MJ/liter = 36.12*10e-6 TJ/liter; and Diesel E.F. = 2.68 $kgCO_2$/liter 2.68 $kgCO_2$/liter of diesel, with a maximum consumption of 40 liters of diesel per 100 km, for diesel heavy trucks, equals 1.1 kgCO2/km, or 0.001 tCO2/km.
Justification of the choice of data or description of measurement methods and procedures actually applied :	The data used is in accordance with the paragraph 19 of AMS III.E.
Any comment:	

Data / Parameter:	***$EF_{BM,y}$***
Data unit:	tCO_2/MWh
Description:	Build margin CO_2 emission factor for grid connected power generation in year *y* published by the Brazilian DNA.
Source of data:	Brazilian DNA website (http://www.mct.gov.br/index.php/content/view/303073.html)
Value applied:	0.0775
Justification of the choice of data or description of measurement methods and procedures actually applied :	The data used is in accordance with the “Tool to calculate the emission factor for an electricity system ”.
Any comment:	-

Justification of the choice of the data above is presented in sections B.6.1 and B.6.3.

B.6.3 Ex-ante calculation of emission reductions:

For the component 1, power-generation, the emission reduction is simply emissions in the baseline scenario (BE_y, in tCO_2e), i.e., the annual electricity supplied to the grid (EG_y, *in MWh*) times the baseline emission factor of the grid (**Erro! Fonte de referência não encontrada.**6).

$$BE_y = EG_y \times EF_y \quad \textbf{Equation 2}$$

For the estimated purposes, data provided by the Brazilian DNA for the year 2007 was applied. When applying the published numbers in the formula presented in step 3 of section B.6.1., the $EF_{grid,OM-DD,y}$ obtained was:

$$\boxed{EF_{grid,OM\text{-}DD,\,2007} = 0.2909\ tCO_2e/MWh.}$$

The building margin for the year of 2007 published by the DNA is:

$$\boxed{EF_{BM,2007} = 0.0775\ tCO_2e/MWh.}$$

With these numbers, applying in the formula presented in step 6 of section B.6.1., we have:

$$\boxed{EF_y = 0.25 \times 0.2909 + 0.75 \times 0.0775}$$

$$\boxed{EF_y = 0.1308\ tCO_2e/MWh.}$$

For the purpose of estimated emission reductions calculations, the total capacity of energy generation by the power plant is considered 28,800 MWh/year, average value in the first crediting period.

For the component 2, methane-emissions-avoidance (AMS-III.E, version 15.1), the emission reductions are given through the equation below:

$$ER_y = BE_y - \left(PE_y + Leakage_y\right)$$ **Equation 7**

The baseline is calculated through the “Tool to determine methane emissions avoided from disposal waste at a solid waste disposal site” (version 4) as described in section B.6.1 – Explanation of methodological choices of the PDD. Parameters to calculate the baseline were based on the IPCC 2006 Guidelines for National Greenhouse Gas Inventories, waste type at the project site and waste disposal site.

According to the above mentioned tool:

$$BE_{CH4,SWDS,y} = \varphi \cdot (1-f) \cdot GWP_{CH4} \cdot (1-OX) \cdot \frac{16}{12} \cdot F \cdot DOC_f \cdot MCF \cdot \sum_{x=1}^{y} \sum_{j} W_{j,x} \cdot DOC_j \cdot e^{-k_j \cdot (y-x)} \cdot \left(1-e^{-k_j}\right)$$ **(Equation 2)**

Definition of parameter values

φ	**0.9**	Model correction factor to account for model uncertainties (default value=0.9)
f	**0**	(0, if methane is not generated). Fraction of methane captured at the SWDS and flared, combusted or used in another manner
GWP_{CH4}	**21**	Global Warming Potential (GWP) of methane, valid for the relevant commitment period

OX	**0**	Oxidation factor (reflecting the amount of methane from SWDS that is oxidized in the soil or other material covering the waste)
F	**0.5**	Fraction of methane in the SWDS gas (volume fraction) (default value=0.5)
DOCf	**0.5**	Fraction of degradable organic carbon (DOC) that can decompose (default value=0.5)
MCF	**0.28**	Methane correction factor.
$W_{j,x}$	**78,000**	$W_{j,x} = W_x$, since 100% of the wood residues combusted are controlled. For the total amount of organic waste prevented from disposal, biomass collected from clearing roads will not be accounted. Based on the average annual value of the first crediting period, $W_{j,x}$= 78,000 tonnes.
DOC_j	**0.43**	Fraction of degradable organic carbon (by weight) in the waste type j (0.43 for wet wood waste)
k_j	**0.03**	Decay rate for the waste type j Piratini is located in the region of Serra do Sudeste, in the state of Rio Grande do Sul, for which ETP=1428.8 mm and MAP=1570.2 mm (source: *Análise mensal da evapotranspiração para o Rio Grande do Sul usando o Modelo Complementar de Morton* - Monthly analysis of evapotranspiration for Rio Grande do Sul, using the Complementary Model of Morton , Master Thesis presented by Edmir dos Santos Jesus at the Universidade Federal de Pelotas, state of Rio Grande do Sul- http://www.ufpel.edu.br/tede/tde_busca/arquivo.php?codArquivo=69 – Appendix A), so that MAP/PET >1 and kj=0.03.

$BE_y = BE_{CH4,SWDS,y}$ = 49,691 tonnes of CO2e in the end of the second crediting period.

For the complete calculation, see annexed spreadsheet “Piratini_SecondPeriod_CERs estimation_revalidation_2009.11.17.xls”.

Project emissions

$$PE_{y,transp} = \left(Q_y / CT_y\right) * DAF_w * EF_{CO2}$$

Most of the sawmills delivering residues to the power plant are located in a maximum distance of 5 km, but one of them is located 190 km away from the plant. In this way, a weighted average distance will be estimated.

This are the parameters used for the estimation:

- Q_y = 78,000 tonnes (average of the first crediting period);

- CT_y = 20 tonnes of residues;

- DAF_w = average round trip distance = 63.4 km (this value was calculated for the verification of credits between 01/08/2007 and 31/07/2008, in the first crediting period, and will be used here for estimation purposes).

EF_{CO2} (diesel emission factor, in tCO_2/km)

2.68 $kgCO_2$/liter of diesel, with a maximum consumption of 40 liters of diesel per 100 km, equals 1.1 kgCO2/km, or 0.001 tCO2/km.

Hence, $PE_{y,\ transp}$ = 78,000/20*63.4*0,001 = 247.3 tones

Leakage

As shown in section B.6.1, leakage is zero.

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

Years	Estimation of project activity emissions reductions (tonnes of CO2e)	Estimation of baseline emissions reductions (tonnes of CO2e)	Estimation of leakage (tonnes of CO2e)	Estimation of emissions reductions (tonnes of CO2e)
2009 (after Feb 1st)	227	5,057	0	4,830
2010	247	8,962	0	8,714
2011	247	14,054	0	13,807
2012	247	20,744	0	20,497
2013	247	28,985	0	28,738
2014	247	38,732	0	38,484
2015	247	49,938	0	49,691
2016 (until Jan 31st)	21	5,214	0	5,193
Total (tonnes of CO2e)	**1,731**	**171,685**	**0**	**169,954**

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

B.7.1 Data and parameters monitored:

Data monitored and required for verification and issuance will be kept for two years after the end of the crediting period.

Data / Parameter:	***GWP_{CH4}***

Data unit:	tCO_2e / tCH_4
Description:	Global Warming Potential (GWP) of methane, valid for the relevant commitment Period
Source of data to be used:	Decisions under UNFCCC and the Kyoto Protocol (a value of 21 is to be applied for the first commitment period of the Kyoto Protocol)
Description of measurement methods and procedures to be applied:	The data will be annually monitored.
QA/QC procedures to be applied:	-
Any comment:	

Data / Parameter:	W_X
Data unit:	Tons
Description:	Total amount of organic waste prevented from disposal in year x (tons)
Source of data to be used:	Measurements by project participants
Value of data applied:	78,000 tons
Description of measurement methods and procedures to be applied:	On-site mechanical scale. Monitoring frequency: Continuously, aggregated at least annually
QA/QC procedures to be applied:	-
Any comment:	For the methane avoidance component, the biomass collected from clearing roads will not be accounted.

Data / Parameter:	EF_y
Data unit:	tCO_2/MWh
Description:	Combined margin CO_2 emission factor for grid connected power generation in year *y* calculated using the values published by the Brazilian DNA.
Source of data to be used:	Brazilian DNA website (http://www.mct.gov.br/index.php/content/view/4016.html)
Value of data applied:	The selected option to calculate the operating margin was the dispatch analysis which does not permit the vintage of *ex-ante* calculation of the emission factor. Hence, this value will be calculated annually *ex-post*, applying the numbers published by the Brazilian DNA and following the steps provided in the “Tool to calculate the emission factor for an electricity system”. The value of 0.1308 tCO_2/MWh, calculated ex-ante, is used as an estimative.
Description of	The data will be annually monitored.

measurement methods and procedures to be applied:	
QA/QC procedures to be applied:	-
Any comment:	-

Data / Parameter:	***EGy***
Data unit:	MWh
Description:	Electricity generation of the Project delivered to grid.
Source of data to be used:	Estimation of Usina Piratini
Value of data applied:	28,800 MWh
Description of measurement methods and procedures to be applied:	Electricity supplied by the project activity to the grid. Double checked by project sponsors internal control and sales receipt or evidences from Câmara Comercializadora de Energia Elétrica – CCEE, a Brazilian government entity which monitors the electricity on the national interconnected grid. Hourly measurement and monthly recording. The data will be continuosly monitored.
QA/QC procedures to be applied:	Energy metering QA/QC procedures are explained in section B.7.2 (the equipments used have by legal requirements an extremely low level of uncertainty).
Any comment:	-

Data / Parameter:	**DAF**
Data unit:	km
Description:	Average round trip distance for residues transportation
Source of data to be used:	Data provided by Usina Piratini
Value of data applied:	63.4 km
Description of measurement methods and procedures to be applied:	The data will be daily monitored.
QA/QC procedures to be applied:	
Any comment:	-

Data / Parameter:	**Leakage (Biomass surplus)**
Data unit:	

Description:	Monitoring of competing uses for the biomass
Source of data to be used:	Data provided by Usina Piratini
Value of data applied:	
Description of measurement methods and procedures to be applied:	PPs will monitor whether there is competing need for the use of wood residues elsewhere, for the same or a different purpose. The data will be annually monitored.
QA/QC procedures to be applied:	
Any comment:	-

B.7.2 Description of the monitoring plan:

According to AMS-I.D (version 13), the monitoring shall consist of metering the electricity generated by the renewable technology.

The project owner is the main responsible for generating, monitoring, measuring and reporting data regarding electricity exportation to the grid. Then, project sponsors measure the total amount of electricity generation, electricity exported to the grid and electricity consumed by the project through an electronic supervisory system. This system keeps historical data that can be accessed when necessary. Data from the supervisory system is the one kept by the meter installed from the local power utility CEEE (from the Portuguese "*Companhia Estadual de Energia Elétrica do Estado do Rio Grande do Sul*", which has a PPA with the Piratini SSC-CDM Project).

According to the Brazilian legislation[11], electricity metering is responsibility of the power utility (CEEE, in the case of the Piratini Project). Therefore, the calibration of the instruments is carried out by CEEE. According to CEEE, calibration validity period is not regulated by Brazilian norm, and there is no specification of the maximum time for replacement of the instruments. The Piratini Project has a backup meter (also regularly verified) used to cross check the data monitored by CEEE.

After measurement, CEEE issues a report of electricity exported to the grid in electronic format and sends it to Piratini power plant. After receiving spreadsheets, the manager of the power plant checks values and sends a final report to the commercial department. The commercial department issues invoices to CEEE.

According to AMS.III-E (version 15.1), the amount of biomass combusted by the project activity in a year shall be monitored. For the methane avoidance component, the biomass collected from clearing roads will not be accounted.

---

[11] Agência Nacional de Energia Elétrica, Resolução 344, 25 de Junho de 2002. Operador Nacional do Sistema & Mercado Atacadista de Energia Elétrica, Sistema de Medição para Faturamento de Energia: Especificação Técnica (2002).

Biomass delivered to the power plant is either wood chips from fresh wood chips processed in sawmills or wood residues from forest/road clearing. The trucks utilize for biomass transportation are identified by license number, driver and biomass type, weighted at the entrance and weighted again after unloading the biomass at the exit of the power plant. The driver keeps a copy of the delivery records. The information is also archived in the computers of the power plant for later payment procedures.

All biomass residues used in the power plant are monitored during both weighting and unloading in the project activity site. Only fresh processed biomass from local sawmills operation (wood chips and sawdust) and a collection of residues from roads and forest clearing (mainly trees branches) are used as fuel in the power plant (as described in the contracts for biomass supply). For the methane avoidance component, the biomass collected from clearing roads will not be accounted. It is important to stress that the power plant does not use rotting biomass as fuel. Rotting biomass has distinctive colour and odour and, if found in any delivered load, the whole pack is not accepted and discarded as fuel.

The project owner monitors wood residues that are burned to generate electricity. The measurement is made through the total of biomass fed into the boiler. This data is obtained through a scale used to quantify wood residues entering the site. This measurement is made manually in the field using a periodically calibrated a mechanical scale. Every day this information is electronically stored into a spreadsheet.

If any small divergence is found, both equipments are re-calibrated. The numbers that lead to the smallest electricity generation and methane avoidance will be used if the uncertainty is not considered significant (less than 1% difference). The electricity generation and methane avoidance will not be accounted for GHG emission reductions if the uncertainty is considered significant.

According to the Brazilian legislation, truck and heavy duty scales have to be annually revised and calibrated by Inmetro (stated owned National Institute of Metrology, Standardization and Industrial Quality). The inspection is always carried out without previous notice.

All relevant records for the monitoring of the Piratini Project (electricity export and biomass consumption at the boiler) are checked by at least two independent management levels. Electricity export is checked by the buyer (CEEE) and by the seller (UTE Piratini). The biomass used in the power plant is verified by the buyer (UTE Piratini) and the sellers (sawmills). All monitored data is archived (electronic and paper) at the project site (Piratini, RS) and is available for verification.

All necessary procedures to monitor emission reductions and any project emissions generated by the project activity are actually part of the business-as-usual procedures of the project, therefore, no extra operational and management structures are necessary.

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 completion of the application of the baseline and monitoring methodology (DD/MM/YYYY): 17/11/2009.

Ecopart Assessoria Ltda.

Rua Padre João Manoel 222
01411-000 São Paulo – SP
Brazil

Ricardo Esparta
ricardo.esparta@ecopart.com.br
Phone: +55 (11) 3063-9068
Fax: +55 (11) 3063-9069

Ecopart Assessoria Ltda. is the Project Advisor.

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:

02/01/2002

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

25y-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 second crediting period:

01/02/2009

C.2.1.2. Length of the first crediting period:

7y-0m

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:

Not applicable in the second crediting period.

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 in the second crediting period.

SECTION E. Stakeholders' comments

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

Not applicable in the second crediting period.

E.2. Summary of the comments received:

Not applicable in the second crediting period.

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

Not applicable in the second crediting period.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Organization:	Piratini Energia S.A.
Street/P.O.Box:	Av. Cônsul Vilares Fragoso 291 – Bongi
Building:	
City:	Recife
State/Region:	Pernambuco
Postfix/ZIP:	50760-540
Country:	Brazil
Telephone:	+55 (81) 2122-2336
FAX:	+55 (81) 2122-2301
E-Mail:	
URL:	
Represented by:	
Title:	Director
Salutation:	Mr.
Last Name:	Carvalho
Middle Name:	
First Name:	Emídio
Department:	
Mobile:	
Direct FAX:	
Direct tel:	
Personal E-Mail:	

Organization:	Toray International U.K. Ltd
Street/P.O.Box:	Verulam Gardens, 70 Gray's Inn Road
Building:	
City:	London
State/Region:	
Postfix/ZIP:	WC1X 8NH
Country:	United Kingdom
Telephone:	+ 44 20 7663-7760
FAX:	+ 44 20 7663-7770
E-Mail:	kanda@toray-intl.co.uk
URL:	
Represented by:	Mr. Mikio Kanda
Title:	
Salutation:	Mr.
Last Name:	Kanda
Middle Name:	
First Name:	Mikio
Department:	

Mobile:	
Direct FAX:	
Direct tel:	
Personal E-Mail:	

Organization:	Sumitomo Mitsui Banking Corporation
Street/P.O.Box:	1-3, Yurakucho, 1-chome
Building:	17F, Tokyo Takarazuka Building
City:	Chiyoda-Ku
State/Region:	Tokyo
Postfix/ZIP:	100-0006
Country:	Japan
Telephone:	+81-3-3592-8235
FAX:	+81-3-3501-8531
E-Mail:	carbon@zn.smbc.co.jp
URL:	
Represented by:	Ms.
Title:	Senior Vice President, Head of ECA Finance Group
Salutation:	Ms.
Last Name:	Kudo
Middle Name:	
First Name:	Teiko
Department:	Structured Finance Dept
Mobile:	
Direct FAX:	+81-3-3501-8531
Direct tel:	+81-3-3592-8235
Personal E-Mail:	Kudo_Teiko@yk.smbc.co.jp

Organization:	The Chugoku Electric Power Co., Inc.
Street/P.O.Box:	4-33 Komachi
Building:	
City:	Naka-Ku
State/Region:	Hiroshima
Postfix/ZIP:	730-8701
Country:	Japan
Telephone:	+(81 82) 523-6162
FAX:	+(81 82) 523-6185
E-Mail:	
URL:	http://www.energia.co.jp/e/index.html
Represented by:	Mr. Shin Hamamoto
Title:	

Salutation:	Mr.
Last Name:	Hamamoto
Middle Name:	
First Name:	Shin
Department:	
Mobile:	
Direct FAX:	+(81 82) 523-6185
Direct tel:	+(81 82) 523-6162
Personal E-Mail:	585988@pnet.energia.co.jp

Organization:	Deutsche Bank AG
Street/P.O.Box:	Winchester House, 1 Great Winchester Street,
Building:	
City:	London
State/Region:	
Postfix/ZIP:	EC2N 2DB
Country:	United Kingdom
Telephone:	+ 44 (207) 547 37 13
FAX:	+ 44 (207) 547 37 13
E-Mail:	milena.lopez@db.com
URL:	
Represented by:	Ms. Milena Lopez
Title:	
Salutation:	Ms.
Last Name:	Lopez
Middle Name:	
First Name:	Milena
Department:	
Mobile:	
Direct FAX:	
Direct tel:	
Personal E-Mail:	

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

No public funding is involved in the present project.

This project is not a diverted ODA from an Annex 1 country.

Annex 3

BASELINE INFORMATION

The Brazilian electricity system, for the purpose of CDM activities, was delineated as a single interconnected system comprehending the five geographical regions of the country (North, Northeast, South, Southeast and Midwest). This was determined by the Brazilian DNA through its Resolution number 8 issued on 26/05/2008.

More information is available at the Brazilian DNA website.

Annex 4

MONITORING INFORMATION

This section is intentionally left blank (see section B.7.2 for monitoring plan).