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:

>>

Pesqueiro Energia Small Hydroelectric Project (hereafter referred to as PESHP).

PDD Version Number: 6

Date: 07/03/2012

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

>>

The primary objective of the PESHP 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 Latin America and the Caribbean region countries have expressed their commitment towards achieving a target of 10% renewable energy of the total energy use in the region. Through an initiative of the Ministers of the Environment in 2002 (UNEP-LAC[1]), a preliminary meeting of the World Summit for Sustainable Development (WSSD) was held in Johannesburg in 1992. In the WSSD final Plan of Implementation no specific targets or timeframes were stated, however, their importance was recognized for achieving sustainability in accordance with the Millennium Development Goals[2].

The PESHP is located in the south of Brazil, where the largest coal reserves are located as well as the most of thermo power plants using this fuel. The project consists of a small-hydro power plant (12.44 MW) located in the Jaguariaíva River, in the city of Jaguariaíva, state of Paraná (Figure 1). According to the Brazilian Institute for Geography and Statistics (from the Portuguese *Instituto Brasileiro de Geografia e Estatística* - IBGE) Jaguariaíva is a city with 32,606 inhabitants located next to the agricultural region of Ponta Grossa[3].

[1] **UNEP-LAC (2002).** *Final Report of the 7th Meeting of the Inter-Sessional Committee of the Forum of Ministers of Environment of Latin America and the Caribbean.* United Nations Environment Programme, Regional Office for Latin America and the Caribbean. 15 to 17 May, 2002, São Paulo (Brazil).

2 WSSD Plan of Implementation, Paragraph 19 (e): "Diversify energy supply by developing advanced, cleaner, more efficient, affordable and cost-effective energy technologies, including fossil fuel technologies and renewable energy technologies, hydro included, and their transfer to developing countries on concessional terms as mutually agreed. With a sense of urgency, substantially increase the global share of renewable energy sources with the objective of increasing its contribution to total energy supply, recognizing the role of national and voluntary regional targets as well as initiatives, where they exist, and ensuring that energy policies are supportive to developing countries' efforts to eradicate poverty, and regularly evaluate available data to review progress to this end."

[3] **IBGE.** *Banco de dados Cidades@,*. Instituto Brasileiro de Geografia e Estatística (http://www.ibge.gov.br/).

Figure 1 - View of PESHP (on the left the power housed, on the right the turbines)

Pesqueiro Energia S.A is a special purpose company (SPC) which includes a run-of-river small hydro power plant and a very small reservoir (0.33km²) with minor environmental impact. The entrepreneurship is a joint venture owned by three agricultural cooperatives. These agricultural cooperatives control three smaller cooperatives created specifically to commercialize the electricity. These three controlled cooperatives specialize in agricultural electrification have 2,500km in transmission lines and commercialize more than 100,000MWh per year. The number of associates is approximately 3,000 and the number of customers is over 7,000. PESHP delivers about 80,000 MWh/year (with an estimated minimum capacity factor of 74.3%) to the South-Southeast-Midwest interconnected grid since February 2003.

This indigenous and cleaner source of electricity will also have an important contribution to environmental sustainability by reducing carbon dioxide emissions that would have occurred otherwise in the absence of the project. The project activity reduces emissions of greenhouse gas (GHG) by avoiding electricity generation by fossil fuel sources (and CO_2 emissions), which would be generating (and emitting) in the absence of the project.

The PESHP Project improves the supply of electricity with clean, renewable hydroelectric power while contributing to the regional/local economic development. Small-scale hydropower run-of-river plants provide local distributed generation, site-specific reliability and transmission and distribution benefits including:

- increased reliability and shorter and less extensive outages
- lower reserve margin requirements
- improved power quality
- reduced lines losses
- reactive power control
- mitigation of transmission and distribution congestion, and
- increased system capacity with reduced T&D investment.

It can be said that fair income distribution is achieved from job creation and an increase in people’s wages, however better income distribution in the region where the PESHP Project is located is obtained from less expenditures and more income in the local municipalities. The surplus of capital that these

municipalities will have could be translated into investments in education and health which will directly benefit the local population and indirectly impact a more equitable income distribution. The lower expenditure is generated 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 would stay in the region and be used for providing the population better services which would improve the availability of basic needs. The local population will receive economic benefits from royalties paid to the municipalities for the water rights granted to PESHP.

A strong indication that PESHP contributes to the country's sustainable development goals is that the project is in accordance with the April 2002 law # 10,438 Proinfa (Programa de Incentivo as Fontes Alternativas de Energia Elétrica). Proinfa is a Brazilian federal program that gives incentive to alternative sources of electricity (wind energy, biomass cogeneration, and a small scale hydropower plant). Among other factors, this initiative's goal is to increase the renewable energy source share in the Brazilian electricity matrix in order to contribute to a greater environmental sustainability through giving these renewable energy sources better economic advantages. The Brazilian government has committed significant funding in order to develop this plan.

Although PESHP is in accordance with Proinfa once it is an alternative source of energy, it was not eligible to access the advantages of the program because the plant was already constructed when the law was finally approved in 2002. Besides it is also important to mention that the Brazilian Decree nr. 5,025 dated March 30th, 2004[1], which regulates the Law nr. 10,438 dated April 26th, 2002[4] that created PROINFA, states that the program 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[5] and need not be taken into account in developing a baseline scenario.

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

[5] Type E- policies are defined as "*national and/or sectoral policies or regulations that give comparative advantages to less emissions-intensive technologies over more emissions-intensive technologies*", in accordance to Annex 3, EB 22, available at http://cdm.unfccc.int/Reference/Guidclarif/meth/meth_guid08_v02.pdf.

A.3. Project participants:

>>

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

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 whishes to be considered as project participant (Yes/No)
Brazil (host)	Pesqueiro Energia S.A (private entity)	No
United Kingdom of Great Britain and Northern Ireland	Ecopart Assessoria em Negócios Empresariais Ltda. (private entity)	No
Japan	The Chugoku Electric Power Co. Inc. (private entity)	No
Switzerland	CM Capital Markets Holding S.A. (private entity)	No
	Trading Emissions PLC (private entity)	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.		

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

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

The Pesqueiro project utilizes water from the Jaguariaíva River to generate electricity (installed power, 12.44MW). The facility contains a small dam (reservoir area = 0.33km^2, power density = 37.70W/m^2) which stores water in order to generate electricity for short periods of time. Run-of-River schemes do not include significant water storage, and must therefore make complete use of the water flow. A typical run-of-river scheme involves a low-level diversion dam and is usually located on swift flowing streams (Figure 2).

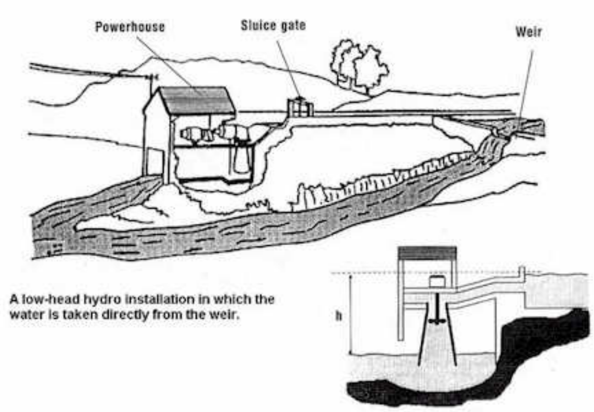


Figure 2 - Schematic view of a run-of-river power plan

According to Eletrobrás[6] (1999), run-of-river projects are defined as "*the projects where the river's dry season flow rate is the same or higher than the minimum required for the turbines*".

A low-level diversion dam raises the water level in the river sufficiently to enable an intake structure to be located on the side of the river. The intake consists of a trash screen and a submerged opening with an intake gate.

Water from the intake is normally taken through a pipe (called a penstock) downhill to a power station constructed downstream of the intake and at as low a level as possible to gain the maximum head on the turbine.

The technology employed at Pesqueiro project is established in the industry. The Francis turbine (Figure 3) is the most widely used among water turbines. This turbine is a type of hydraulic reactor turbine in which the flow exits the turbine blades in the radial direction. Francis turbines are common in power generation and are used in applications where high flow rates are available at medium hydraulic head. Water enters the turbine through a volute casing and is directed onto the blades by wicket gates. The low momentum water then exits the turbine through a draft tube. In the model, water flow is supplied by a variable speed centrifugal pump. A load is applied to the turbine by means of a magnetic brake, and torque is measured by observing the deflection of calibrated springs. The performance is calculated by comparing the output energy to the energy supplied.

Figure 3 - Francis Turbine (Source: Alstom, http://www.alstom.com.br/**)**

[6] **Eletrobrás (1999).** *Diretrizes para estudos e projetos de pequenas centrais hidrelétricas.* Centrais Elétricas Brasileiras S.A.

The equipment and technology used in the PESHP Project has been successfully applied to similar projects in Brazil and around the world. The below table presents a description of the equipments installed in the plant.

Table 2 - Specifications of the equipment used at PESHP

Turbines	
Type	Simple Francis
Quantity	2
RPM	514,3
Power(MW)	6.22
Nominal Liquid Head(m)	86
Generators	
Type	SPA 1250
Quantity	2
Frequency (HZ)	60
Power (MVA)	6.8
Nominal Voltage (kW)	6.9

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 Paraná (South of Brasil)

A.4.1.3. City/Town/Community etc:

>>
Jaguariaíva

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 south of Brazil, state of Paraná, city of Jaguariaíva (latitude 24º07'58" South and longitude 49º38'09" West, Figure 4), and uses using the hydro potential of the Jaguariaíva River. The Jaguariaíva River is part of the Paraná River basin (Figure 5).

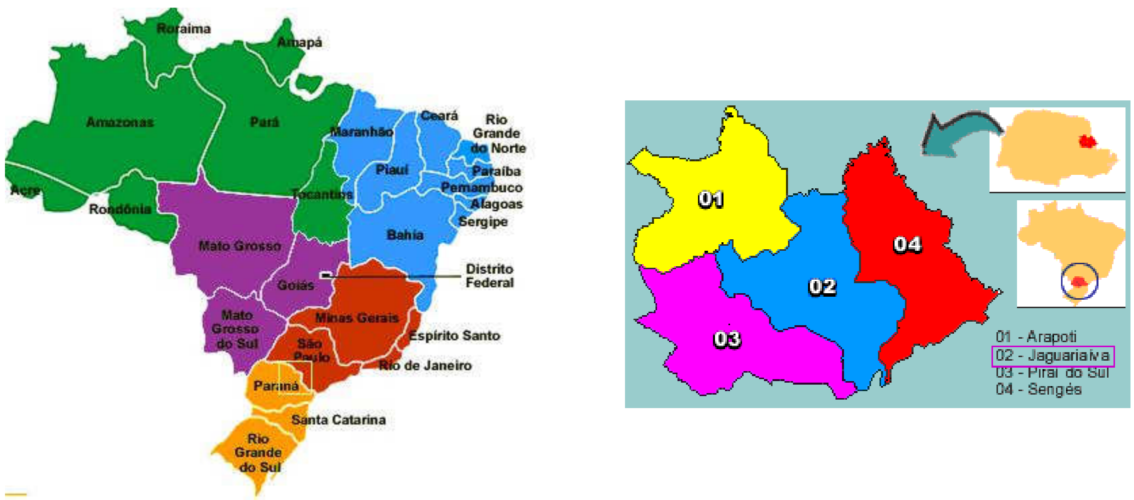


Figure 4 - Political division of Brazil showing the Paraná State and the city of Jaguariaíva (Sources: http://www.citybrazil.com.br/).

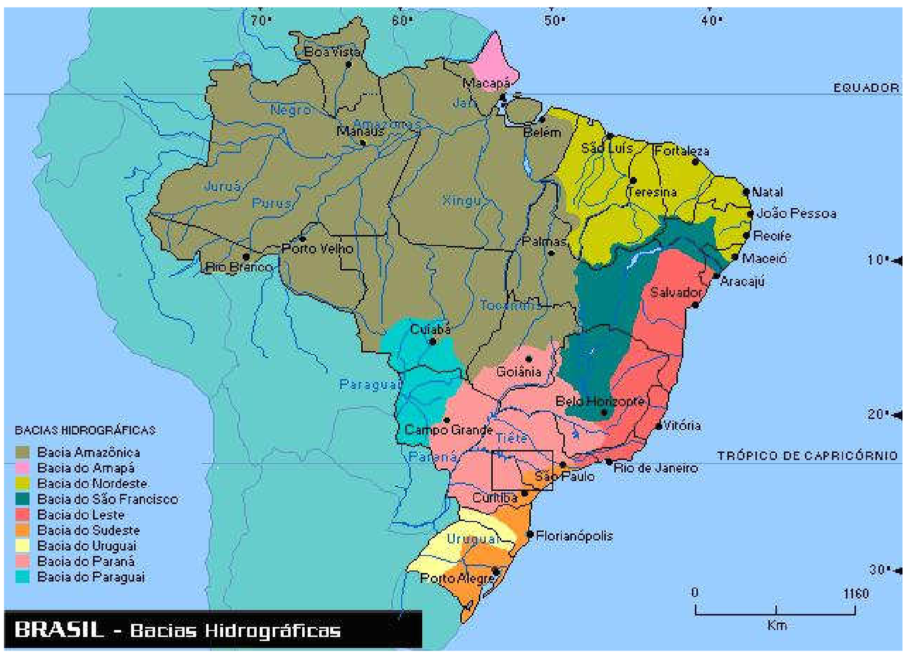


Figure 5 - Major Brazilian river basins (Source: http://www.portalbrasil.net/)

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

>>

Type 1: Renewable energy projects

Category I.D.: Electricity generation for a system. PESHP uses the renewable hydro potential of the Jaguariaíva River to supply electricity to a distribution system (Brazilian South-Southeast-Midwest interconnected grid) that is supplied by at least one fossil fuel fired generating unit and has an installed capacity of 12.44MW (below the eligibility limit of 15MW for small scale projects). The equipment used in the project was developed and manufactured locally.

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

>>

Considering the estimated baseline emission factor equal to 0.2215tCO_2e/MWh, which is applicable to grid-connected renewable power generation project activities in Brazil[7], the full implementation of the small hydropower plant connected to the Brazilian Interconnected System will generate the estimated annual reduction as in Table 3 below.

Table 3 - Project Emission Reductions Estimation

Years	Annual estimation of emission reductions in tonnes of CO2e
2010 (Starting in January 27th)	16,650
2011	17,927
2012	17,927
2013	17,927
2014	17,927
2015	17,927
2016	17,927
2017 (Until January 26th)	1,277
Total Estimated Emissions Reductions (tonnes of CO2e)	**125,492**
Total number of crediting years	7
Annual average over the crediting period of estimated reductions (tonnes of CO2e)	17,927

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

>>

There is no recourse to any public funding by the PPs in the proposed project activity. The project proponents hereby confirm that there is no divergence of Official Development Assistance (ODA) to the proposed project activity.

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 projects activities debundling is defined as the fragmentation of a larger 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:

[7] At the time of submission of the request for renewal of the crediting period to the DOE.

- 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.

Considering there are no CDM project registered within 1km from the PESHP, the proposed project activity shall not be considered as a part of a larger 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:

>>

AMS-I.D – *"Grid connected renewable electricity generation"* (version 17)

In addition to the methodology, the following methodology/tools are used:

– *"Consolidated baseline methodology for grid-connected electricity generation from renewable sources"* (version 12.2.0) – used with the purpose of estimating possible emissions from the reservoir.

– *"Tool to calculate the emission factor for an electricity system"* (version 2.2.1)

– *"Validity of the original/current baseline and to update the baseline at the renewal of a crediting period"* **(**version 3.0.0)

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

>>

This CDM project activity corresponds to Category I.D. because it complies with the following applicability conditions:

1. *This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass:*

    (a) *Supplying electricity to a national or a regional grid; or*

    (b) *Supplying electricity to an identified consumer facility via national/regional grid through a contractual arrangement such as wheeling.*

    The project activity consists of a small-hydro power plant connected to the grid (option a).

2. *Illustration of respective situations under which each of the methodology (i.e. AMS-I.D, AMS-I.F and AMS-I.A) applies is included in Table 2.*

As described above, the Pesqueiro Small Hydro Power Plant supplies electricity to Brazilian grid. Therefore, as described in Table 2 of the methodology, AMS-I.D. is suitable to the proposed project activity.

3. *This methodology is applicable to project activities that: (a) Install a new power plant at a site where there was no renewable energy power plant operating prior to the implementation of the project*

activity (Greenfield plant); (b) Involve a capacity addition; (c) Involve a retrofit of (an) existing plant(s); or (d) Involve a replacement of (an) existing plant(s).

The proposed project activity corresponds to option a) above, *i.e.* a Greenfield plant.

4. *Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology:*
   - *The project activity is implemented in an existing reservoir with no change in the volume of reservoir;*
   - *The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the project emissions section, is greater than $4W/m^2$;*
   - *The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the project emissions section, is greater than $4W/m^2$.*

The power density of the plant is $37.70MW/km^2$ (as determined below in section B.6.3.). Therefore, the proposed project activity satisfies this applicability condition.

5. *If the new unit 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 new unit co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15MW.*

The proposed project activity has not non-renewable components. Hence, it does not co-fire fossil fuels. The maximum output capacity of Pesqueiro Small Hydro Power Plant is 12.44MW and which will not increase beyond 15MW.

6. *Combined heat and power (co-generation) systems are not eligible under this category.*

Not applicable. The proposed project activity does not correspond to a combined heat and power system.

7. *In the case of project activities that involve the addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15MW and should be physically distinct from the existing units.*

Not applicable. As discussed above, the proposed project activity corresponds to a Greenfield plant.

8. *In the case of retrofit or replacement, to qualify as a small-scale project, the total output of the retrofitted or replacement unit shall not exceed the limit of 15MW.*

Not applicable. As discussed above, the proposed project activity corresponds to a Greenfield plant.

B.3. Description of the project boundary:

>>

According to AMS-I.D methodology "*The spatial extent of the project boundary includes the project power plant and all power plants connected physically to the electricity system that the CDM project power plant is connected to*".

Also, the project boundaries are defined by the emissions targeted or directly affected by the project activities, construction and operation. Hence, it encompasses the physical, geographical site of the

hydropower generation source, which is represented by the Jaguariaíva River basin close to the power plant facility and the interconnected grid.

On May 26th, 2008, the Brazilian Designated Authority published Resolution #8 defining the Brazilian Interconnected Grid as a single system covering all five geographical regions of the country (North, Northeast, South, Southeast and Midwest)[8].

B.4. Description of baseline and its development:

>>

According to paragraph 10 of the selected methodology, "*the baseline scenario is that the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources into the grid*".

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:

In accordance with the "*Procedure for renewal of the crediting period of a registered CDM Project Activity*" (version 6.0), the "*Tool to assess the validity of the original/current baseline and to update the baseline at the renewal of a crediting period*" will be applied to determine whether the original project baseline is still valid or it has been updated taking account of new data where applicable.

Step 1: Assess the validity of the current baseline for the next crediting period:

The "Procedures for the renewal of the crediting period of a registered CDM project activity" approved by the CDM Executive Board requires an assessment of the impacts of new relevant national and/or sectoral policies and circumstances on the baseline. The validity of the current baseline is assessed using the following Sub-steps:

Step 1.1: Assess compliance of the current baseline with relevant mandatory national and/or sectoral policies

There are no new relevant national and/or sectoral policies and/or circumstances in the electricity generation sector applicable to the Project Activity, in comparison to the time of the Project's start date, which would affect the compliance of the current baseline scenario.

[8] Comissão Interministerial de Mudança Global do Clima (CIMGC). Available at: <http://www.mct.gov.br/upd_blob/0024/24719.pdf>.

Step 1.2: Assess the impact of circumstances

There are no new relevant national and/or sectoral policies and/or circumstances in the electricity sector applicable to the Project Activity, in comparison to the time of the Project's start date, which could impact the validity of the current baseline for the next crediting period.

Step 1.3: Assess whether the continuation of the use of current baseline equipment(s) or an investment is the most likely scenario for the crediting period for which renewal is requested

The current baseline scenario is the continuation of the current practice. In the absence of the project, the electricity produced by SHPP would have been generated by the National Interconnected System (**SIN, from the Portuguese "Sistema Interligado Nacional"**). The **SIN** is composed by over 2.200 plants[9] with different energy sources, such as: hydro, oil, natural gas, biogas, cane bagasse, wood, rice husk, coal, wind and nuclear), each one with specific characteristics and equipments. Thus this step does not apply, since the whole system would continue to supply energy independently of the lifetime of individual equipments.

Step 1.4: Assessment of the validity of the data and parameters

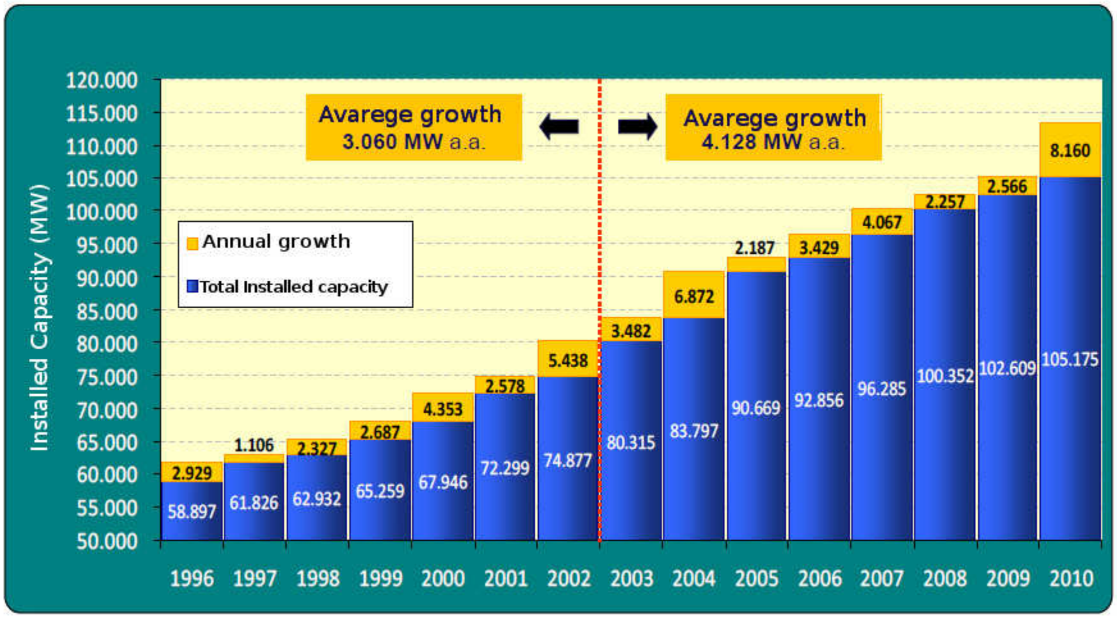
According to the tool "*Validity of the original/current baseline and to update the baseline at the renewal of a crediting period*", updates should be undertaken in the following cases:

- *Where IPCC default values are used, the values should be updated if any new default values have been adopted and published by the IPCC, for example, in guidelines for national GHG inventories, IPCC assessment report or special reports by the IPCC;*
- *Where emission factors, values or emission benchmarks are used and determined only once for the crediting period, they should be updated, except if the emission factors, values or emission benchmarks are based on the historical situation at the site of the project activity prior to the implementation of the project and cannot be updated because the historical situation does not exist anymore as a result of the CDM project activity.*

As mentioned above, the current baseline scenario is the electricity generation by the **SIN**, which have been enlarged to attend the increasing demand for electrical energy supply, fact that can be verified by the increase of the SIN´s installed capacity[10] (Table 4).

[9] Source ANEEL, 2010 available at http://www.aneel.gov.br/aplicacoes/capacidadebrasil/capacidadebrasil.asp
[10] Data obtained from a EPE´s presentation (from Portuguese "Empresa de Pesqueisa Energética") (available at http://www.senado.gov.br/web/comissoes/ci/ap/AP20091210_Dr_Mauricio_Tolmasquin.pdf, accessed on 09/04/2010)

Table 4 - Increase of the installed capacity of SIN



Source: CMSE – SIN (considering a projection for 2010)

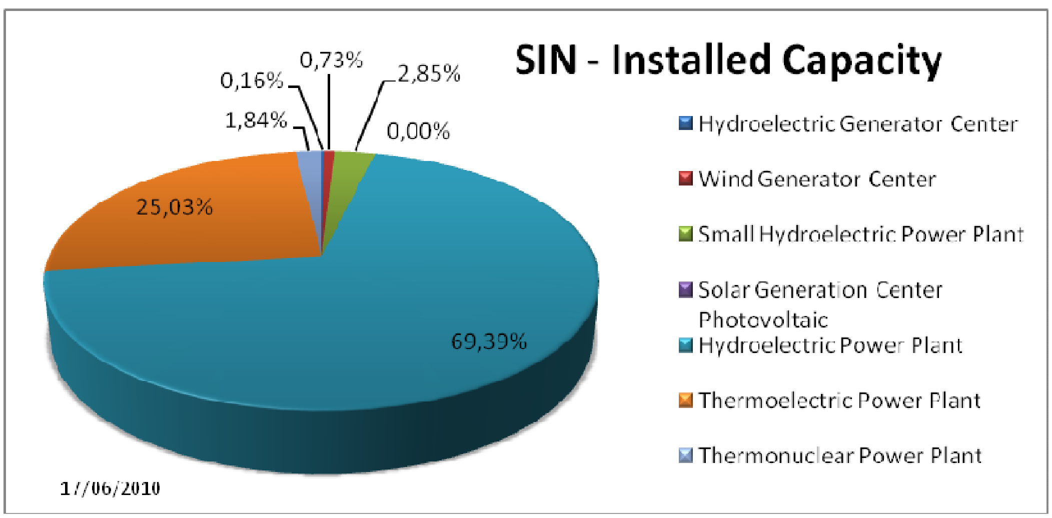


Figure 6 - Operational types of project (% installed capacity) - Source: ANEEL, 2010[11]

The dispatch of new energy plants altered the energy matrix profile. According to ANEEL latest data: 69.39% of Brazil's installed capacity is composed by large hydropower plants and 25.03% by thermal power stations (Figure 6), during the time of the first registration, the profile was: 74.1% large hydropower

[11] Agência Nacional de Energia Elétrica (ANEEL). Banco de Informações de Geração (BIG). Available at: < http://www.aneel.gov.br/aplicacoes/capacidadebrasil/capacidadebrasil.asp> (accessed on 17/06/2010).

plants, and 12.3% by thermal power station[12]. As can be noticed, the profile of the energy plants that dispatche energy to the **SIN** have altered, increasing the amount of fossil fuel participation in it. These facts reflect on the emission factor value, which must be recalculated.

An article prepared by three professors from Universidade de São Paulo[13] in May 2009 analyzes the expansion of Brazilian electricity system and considers that the technical-economic limit of hydropower projects related to the socially acceptable issues is almost reached. In this context, the study points as a trend the implementation of fossil fuel thermal power plants or large projects in the Amazon region. The study states that although investment in renewable energy in a long-term planning is being made, the Brazilian energy supply tends towards a more intensive use of fossil fuels, mainly to the insertion of natural gas and coal thermal power plants.

The article concludes that, besides of the optimization of the initiatives that already exist, barriers for the renewable energy generation shall be removed through:

a) A reduction of subsidy for conventional electricity generation, as the so-called Fuel Consumption Account (in a free translation from the Portuguese *Conta Consumo de Combustíveis – CCC*), created to finance the use of diesel oil for energy generation;

b) A revision of incentives for industries that for a long period received fiscal incentives to be installed in certain regions of the country;

c) An alteration in the rules of energy auctions considering that the current model privilege thermoelectric generation from fossil fuel.

Considering the item (c) mentioned above, in the energy auctions, which took place between 2005 and 2007 from the total of 9,594MW sold, 5,888MW (61.3%) will come from fossil fuel fired thermal power plants, from which 2,152 MW come from natural gas and 2,514 MW fuel oil fired thermal power plants, *i.e.*, 22.4% and 26.2% of the total sold respectively[14]. Considering the energy auctions which took place from 2008 to 2009[15], from the total 4,212MW sold, 4,045MW (96.0%) will come from fossil fuel fired thermal power plants. Only 3.96% will come from renewable energy projects: 45MW from sugarcane bagasse and 122MW from hydropower plant sources.

As can be concluded by the analysis, renewable energy projects similar to the project activity are not common practice at the Brazilian energy market, barriers for small renewable energy generation projects still exist, the current baseline scenario is still valid and the related data must be updated.

[12] Source MME, Brazilian National Energy Balance, available at http://www.mme.gov.br/mme/galerias/arquivos/publicacoes/BEN/8_-_Edicoes_Anteriores_BEN_e_Resenhas_-_pdf/1_-_BEN_Anteriores/4_-_BEN_2007_-_Ano_Base_2006.pdf

[13] Mitigação de gases de efeito estufa: a experiência setorial e regional no Brasil / coordenado por Jacques Marcovitch. -- São Paulo: FEA/USP, 2009. Link to this article: <http://www.usp.br/mudarfuturo/2009/cap4.htm>.

[14] ESPARTA, A. R. J. (2008). Redução de emissões de gases de efeito estufa no setor elétrico brasileiro: a experiência do Mecanismo de Desenvolvimento Limpo do Protocolo de Quioto e uma visão futura. PhD Thesis, Universidade de São Paulo.

[15] 6th, 7th and 8th energy auctions for new projects (from the Portuguese leilão de energia nova) held on September 17th/30th, 2008 and August 27th, 2009. Information available at: <http://www.ccee.org.br/cceeinterdsm/v/index.jsp?vgnextoid=d3caa5c1de88a010VgnVCM100000aa01a8c0RCRD>.

Step 2: Update the current baseline and the data and parameters

Step 2.1: Update the current baseline

As already mentioned, the current scenario still valid, thus there is no need to be updated.

Step 2.2: Update the data and parameters

Considering the changes registered in the Brazilian energy matrix as commented in step 1.1 above, CO_2 emission factor of the grid has to be up-dated. In this second crediting period the emission factor of the grid was up-dated following procedures of the latest version of the *"Tool to calculate the emission factor for an electricity system"*. See section B.6.1 and B.6.3 of this PDD for the calculations.

B.6. Emission reductions:

B.6.1. Explanation of methodological choices:

>>

<u>*Baseline Emissions*</u>

Baseline emissions are calculated using the annual generation (project annual electricity dispatched to the grid) times the CO_2 average emission rate of the estimated baseline and correspond to the CO_2 emissions that are displaced as a consequence of the project activity, calculated as follows:

$$BE_y = EG_{BL,y} * EF_{CO2,grid,y}$$ **Equation 1**

Where,

BE_y = Baseline emissions in year y (tCO2/yr)

$EG_{BL,y}$ = Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year y (MWh)

$EF_{CO2,grid,y}$ = CO_2 emission factor of the grid in year y (t CO_2/MWh).

According to the selected approved methodology CO_2 emission factor of the grid ($EF_{CO2,grid,y}$) is calculated using the methodological tool "*Tool to calculate the emission factor for an electricity system*" (paragraph 12.a). According to this tool Project Participants shall apply six steps to calculate the grid emission factor as further detailed below.

- **STEP 1 -** Identify the relevant electricity systems

According to the tool, "*If the DNA of the host country has published a delineation of the project electricity system and connected electricity systems, these delineations should be used. If such delineations are not available, project participants should define the project electricity system and any connected electricity system and justify and document their assumptions in the CDM-PDD*".

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). Hence, this figure will be used to calculate the baseline emission factor of the grid.

- **STEP 2 -** Choose whether to include off-grid power plants in the project electricity system (optional).

  Option I of the tool is chosen, which is to include in the calculation only grid power plants.

- **STEP** 3 **-** Select a method to determine the operating margin (OM)

The calculation of the operating margin emission factor ($EF_{grid,OM,y}$) is based on one of the following methods:

(a) Simple OM, or

(b) Simple adjusted OM, or

(c) Dispatch data analysis OM, or

(d) Average OM.

The Brazilian DNA made available the operating margin emission factor calculated using option c – Dispatch data analysis OM. Detailed information on the methods and data applied can be obtained in the DNA's website (http://www.mct.gov.br/index.php/content/view/317399.html#ancora), site accessed on June 2010).

In accordance with the tool, for the dispatch data analysis, the emission factor shall be up-dated annually, i.e. the *ex-post* data vintage is chosen.

- **STEP 4 -** Calculate the operating margin emission factor according to the selected method

The dispatch data analysis OM emission factor ($EF_{grid,OM-DD,y}$) is determined based on the power units that are actually dispatched at the margin during each hour *h* where the project is displacing electricity. This approach is not applicable to historical data and, thus, requires annual monitoring of $EF_{grid,OM-DD,y}$. As consequence it will be calculated ex-post.

The $EF_{grid,OM-DD,y}$ will be calculated using the below formula:

$$EF_{grid,OM-DD,y} = \frac{\sum_{h} EG_{PJ,h} \cdot EF_{EL,DD,h}}{EG_{PJ,y}} \qquad \textbf{Equation 2}$$

Where,

$EF_{grid,OM-DD,y}$ = Dispatch data analysis operating margin CO_2 emission factor in year *y* (tCO_2/MWh);

$EG_{PJ,h}$ = Electricity displaced by the project activity in hour *h* of the year *y* (MWh);

$EF_{EL,DD,h}$ = CO_2 emission factor for power units in the top of the dispatch order in hour *h* in year *y* (tCO_2/MWh);

$EG_{PJ,y}$ = Total electricity displaced by the project activity in year *y* (MWh);

h = Hours in year *y* in which the project activity is displacing grid electricity;

y = Year in which the project activity is displacing grid electricity.

Calculation of hourly CO_2 emission factor for grid power units ($EF_{EL,DD,h}$)

As mentioned above, the host country's DNA will provide $EF_{EL,DD,h}$ in order to Project Participants to calculate the operating margin emission factor. However, the project participants neither have access to the decisions that the Brazilian DNA took in order to calculate the hourly CO_2 emission factor nor to the spreadsheet used. Only final values are available for public consultation. Hence, the project participants are not able to describe which method has been used to calculate the hourly emission factor.

Nevertheless, this data will be updated annually applying the official number published by the Brazilian DNA. For estimative purposes and to be consistent with the option used to determine the build margin, the data used is the most recent information available on units already built (2008) and available in the DNA website at the time of submission of the request for renewal of the crediting period to the DOE (May, 2009).

Calculation to determine the set of grid power units n in top of the dispatch

The Brazilian DNA made available the calculation of the operating margin emission factor based on option (c) dispatch data analysis. Therefore, the project participants used this figure for the proposed project activity calculation of the grid emission factor.

However, the project participants neither have access to the decisions that the Brazilian DNA took in order to determine the set of power units *n* nor to the spreadsheet used. Only final values for the hourly emission factor ($EF_{EL,DD,h}$) are available for public consultation. Hence, the project participants are not able to describe which method has been used to determine the set of power units *n*.

- **STEP 5 –** Calculate the build margin (BM) emission factor

The build margin emissions factor is the generation-weighted average emission factor (tCO_2/MWh) of all power units *m* during the most recent year *y* for which electricity generation data is available, calculated as follows:

$$EF_{grid,BM,y} = \frac{\sum_{m} EG_{m,y} \times EF_{EL,m,y}}{\sum_{m} EG_{m,y}} \qquad \textbf{Equation 3}$$

Where,

$EF_{grid,BM,y}$ = Build margin CO_2 emission factor in year *y* (tCO_2/MWh)

$EG_{m,y}$ = Net quantity of electricity generated and delivered to the grid by power unit *m* in year *y* (MWh)

$EF_{EL,m,y}$ = CO_2 emission factor of power unit *m* in year *y* (tCO_2/MWh)

m = Power units included in the build margin

y = Most recent historical year for which electricity generation data is available

During the first crediting period of the proposed project activity, the build margin emission factor was determined ex-ante. Therefore, the provision of Option 1 applies, which is "*for the second crediting period, the build margin emission factor should be updated based on the most recent information available on units already built at the time of submission of the request for renewal of the crediting period to the DOE. (…) This option does not require monitoring the emission factor during the crediting period.*"

The build margin was also calculated by the DNA. The number was published in the website and the data from 2008 is used, since it was the most recent available information by the time the renewal of the crediting period was request to the DOE.

However, the project participants neither have access to the decisions that the Brazilian DNA took in order to determine the set of power units *m* and their CO_2 emission factor nor to the spreadsheet used. Only final values are available for public consultation. Hence, the project participants are not able to describe which method has been used to determine the set of power units *m*.

- **STEP 6 –** Calculate the combined margin (CM) emissions factor

The calculation of the combined margin (CM) emission factor may be based on one of the following methods:

(a) Weighted average CM; or

(b) Simplified CM.

The weighted average CM method (option A) should be used as the preferred option.

The simplified CM method (option b) is not applicable since it can only be used if:

- The project activity is located in a Least Developed Country (LDC) or in a country with less than 10 registered CDM projects at the starting date of validation; and
- The data requirements for the application of step 5 above cannot be met.

(a) *Weighted average CM*

Under this option, the combined margin is calculated as follows:

$$EF_{grid,CM,y} = w_{OM} \cdot EF_{grid,OM,y} + w_{BM} \cdot EF_{grid,BM,y}$$ **Equation 4**

The following default values should be used for w_{OM} and w_{BM}:

- Wind and solar power generation project activities: w_{OM} = 0.75 and w_{BM} = 0.25 (owing to their intermittent and non-dispatchable nature) for the first crediting period and for subsequent crediting periods;
- All other projects: w_{OM} = 0.5 and w_{BM} = 0.5 for the first crediting period, and w_{OM} = 0.25 and w_{BM} = 0.75 for the second and third crediting period, unless otherwise specified in the approved methodology which refers to this tool.

Therefore, in accordance with the tool, the weights w_{OM} and w_{BM}, for the second crediting period, by default, are w_{BM} = 0.75 and w_{OM} = 0.25.

Project Emissions

According to the SSC methodology, emissions from reservoirs, if there is any, shall be estimated considering the procedure described in the most recent version of ACM0002. According with to methodology, for *hydro power project activities that result in new single (…) reservoirs (…),* as it is the case of the proposed project activity, *project proponents shall account for CH_4 and CO_2 emissions from the reservoirs, estimated as follows*:

a) if the power density of the single or multiple reservoirs (*PD*) is greater than 4W/m^2 and less than or equal to 10W/m^2:

$$PE_{HP,y} = \frac{EF_{Res} \cdot TEG_y}{1000}$$ **Equation 5**

Where,

$PE_{HP,y}$	=	Project emissions from water reservoirs (tCO_2e/yr)
EF_{Res}	=	Default emission factor for emissions from reservoirs of hydro power plants in year *y* ($kgCO_2e$/MWh)
TEG_y	=	Total electricity produced by the project activity, including the electricity supplied to the grid and the electricity supplied to internal loads, in year *y* (MWh)

b) If power density of the project is greater than 10W/m^2, PE_y = 0.

The power density of the project activity (*PD*) is calculated as follows:

$$PD = \frac{Cap_{PJ} - Cap_{BL}}{A_{PJ} - A_{BL}}$$ **Equation 6**

Where:

PD = Power density of the project activity (W/m^2)

Cap_{PJ} = Installed capacity of the hydro power plant after the implementation of the project activity (W)

Cap_{BL} = Installed capacity of the hydro power plant before the implementation of the project activity (W). For new hydro power plants, this value is zero

A_{PJ} = Area of the single or multiple reservoirs measured in the surface of the water, after the implementation of the project activity, when the reservoir is full (m^2)

A_{BL} = Area of the single or multiple reservoirs measured in the surface of the water, before the implementation of the project activity, when the reservoir is full (m^2). For new reservoirs, this value is zero

Leakage Emissions

Estimation of leakage emissions is not required because the energy generating equipment wasn't transferred from another activity nor the existing equipment was transferred to another activity.

Emission Reductions

The total emission reductions are baseline emissions minus leakage and project emissions, as described in the below formula.

$$ER_y = BE_y - PE_y - LE_y$$ **Equation 7**

Where,

ER_y = Emission Reductions in year "*y*", in tCO_2/year

BE_y = Baseline Emissions in year "*y*", in tCO_2/year

PE_y = Project Emissions in year "*y*", in tCO_2/year

LE_y = Leakage Emissions in year "*y*", in tCO_2/year

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

Data / Parameter:	$EF_{grid,BM,y}$
Data unit:	tCO_2/MWh
Description:	Build margin CO2 emission factor in year y
Source of data used:	
Value applied:	0.1458
Justification of the	This information is published by the Brazilian Designated Authority.

choice of data or description of measurement methods and procedures actually applied :	
Any comment:	

Data / Parameter:	***Cap_{BL}***
Data unit:	W
Description:	Installed capacity of the hydro power plant before the implementation of the project activity
Source of data used:	ACM0002
Value applied:	0
Justification of the choice of data or description of measurement methods and procedures actually applied :	In accordance with the ACM0002 methodology, for new hydropower plants, this value is zero.
Any comment:	-

Data / Parameter:	***A_{BL}***
Data unit:	m^2
Description:	Area of the single or multiple reservoirs measured in the surface of the water, before the implementation of the project activity, when the reservoir is full
Source of data used:	ACM0002
Value applied:	0
Justification of the choice of data or description of measurement methods and procedures actually applied :	In accordance with the ACM0002 methodology, for new hydropower plants, this value is zero.
Any comment:	-

B.6.3 Ex-ante calculation of emission reductions:

>>

<u>*Baseline Emissions*</u>

As described in section B.6.1, baseline emissions (BE_y) are calculated directly from net electricity supplied by the project to the grid ($EG_{BL,y}$) multiplied by the emission factor ($EF_{CO2,grid,,y}$).

Future electricity supplied by the project to the grid is estimated multiplying the installed capacity of the plant by its capacity factor and the hours that it is going to be operational in the year.

Additionally, the calculation of the combined margin CO_2 emission factor for grid connected power generation ($EF_{grid,CM,y}$) follows the steps established in the "*Tool to calculate the emission factor for an electricity system*". The results are presented below.

- **STEP 1 -** Identify the relevant electricity systems

Following Resolution #8, issued by the Brazilian DNA on 26th May, 2008, the Brazilian Interconnected Grid (from the Portuguese *Sistema Interligado Nacional – SIN*) corresponds to the system to be considered. It covers all the five macro-geographical regions of the country (North, Northeast, South, Southeast and Midwest) as presented in the figure below.

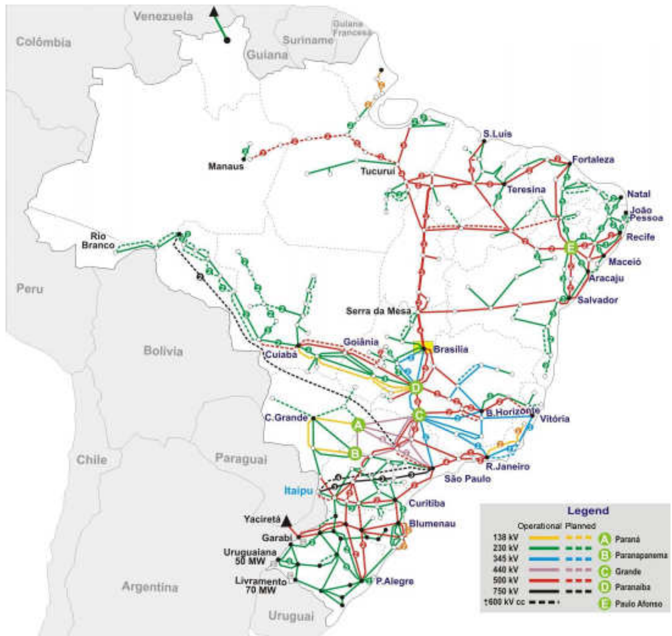


Figure 7 – Brazilian Interconnected System. (*Source:* Electric System National Operator)

- **STEP 2** – *Choose whether to include off-grid power plants in the project electricity system (optional)*

Option I was chosen and only grid connected power plants are considered.

- **STEP 3 -** *Select a method to determine the operating margin (OM)*

The Brazilian DNA made publicly available the OM through the dispatch data analysis OM (option C). Therefore, this method was used for the proposed project activity. Please refer to section B.6.1. for explanation of the methodological choices.

- **STEP 4 -** Calculate the operating margin emission factor according to the selected method

For estimation purposes, data provided by the Brazilian DNA for the year 2008 were applied in the calculation of the operating margin CO_2 emission factor[16]. Please refer to section B.6.1. for explanation of the methodological choices. When applying the published numbers in the formula presented in step 3 of section B.6.1., the $EF_{grid,OM\text{-}DD,2008}$ obtained was:

$$\boxed{EF_{grid,OM\text{-}DD,\ 2008} = 0.4487\ tCO_2e/MWh.}$$

- **STEP 5 -** Calculate the build margin (BM) emission factor

[16] The most recent data available at the time of submission of the request for renewal of the crediting period to the DOE (May, 2009, i.e., 2008 vintage) was used.

The building margin was determined using data for the year of 2008, as published by the DNA. As explained above in section B.6.1, this value will not be monitored. The result is:

$$EF_{grid,BM,2008} = 0.1458 \text{ tCO}_2\text{e/MWh.}$$

- **STEP 6 –** Calculate the combined margin (CM) emission factor

Applying the results presented above in STEPS 4 and 5 above to the formula presented in step 6 of section B.6.1. and considering the weights $w_{OM} = 0.75$ and $w_{BM} = 0.25$, we obtain:

$$EF_{grid,CM,2008} = 0.25 \times 0.4487 + 0.75 \times 0.1458$$

$$EF_{grid,CM,2008} = 0.2215 \text{ tCO}_2\text{e/MWh.}$$

The electric energy generated by the plant can be estimated considering the assured energy authorized by ANEEL, which is 9.24 MW on average per year.

Hence, $EG_{BL,y}$ = 9.24 * 365 * 24 = 80,942 MWh/year.

Substituting the numbers described above in Equation 1 of section B.6.1 we have:

$$BE_{BL,y} = 80{,}942 * 0.2215 = 17{,}927 \text{ tCO}_2\text{/year}$$

Project Emissions

The reservoir area as established in the environmental license of the plant is equal to 330,000 m^2. The installed capacity is 12,440,000 MW. Hence, the power density of the plant is 37.70 W/m^2.

Therefore option b) described in section B.6.1. above is applicable and no project emissions are to be calculated, $\boxed{PE_y = 0}$.

Leakage Emissions

As described above in section B.6.1., there are no leakage emissions associated with the implementation of the proposed CDM project activity. Hence, $\boxed{LE_y = 0}$.

Emission Reductions

When applying the results presented above in Equation 7 of section B.6.1 we have:

$$ER_y = 17{,}927 - 0 – 0 = 17{,}927 \text{ tCO}_2\text{/year}$$

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

>>

Table 5 - tCO2 total estimation reduction of the project

Year	**Estimation of project activity emissions (tones of CO_2e)**	**Estimation of baseline emissions (tones of CO_2e)**	**Estimation of leakage (tones of CO_2e)**	**Estimation of overall emission reductions (tones of CO_2e)**
2010 (*)	0	16,650	0	16,650
2011	0	17,927	0	17,927
2012	0	17,927	0	17,927
2013	0	17,927	0	17,927
2014	0	17,927	0	17,927
2015	0	17,927	0	17,927
2016	0	17,927	0	17,927
2017 (**)	0	1,277	0	1,277
Total (tonnes of CO_2e)	**0**	**125,492**	**0**	**125,492**

** from January 27th, 2010.*
*** Until January 26th, 2017.*

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 or the last issuance of CERs for this project activity, whichever occurs later.

Data / Parameter:	$EG_{BL,y}$
Data unit:	MWh
Description:	Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year *y*
Source of data to be used:	Local measurements
Value of data applied for the purpose of calculating expected emission reductions in section B.5	80,942
Description of measurement methods and procedures to be applied:	The electricity delivered to the grid is monitored both by the project owner (seller) as well as by the energy buyer. A Brazilian government entity, CCEE – *Câmara Comercializadora de Energia Elétrica* - controls and monitors the electricity available on the national interconnected grid. The amount of electricity delivered to the grid by the project activity shall be cross-checked

	with the Reports issued by CCEE (records for sold electricity). This parameter is hourly measured and monthly recorded by the project owner. The CCEE reports presents this information consolidated on a weekly basis.
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 extremely low level of uncertainty).
Any comment:	This parameter is equivalent to the parameter $EG_{PJ,y}$ used to calculate the operating margin CO_2 emission factor of the grid, as mentioned in the "*Tool to calculate the emission factor for an electricity system*"

Data / Parameter:	$EG_{PJ,h}$
Data unit:	MWh
Description:	Electricity displaced by the project activity in hour *h* of the year *y*
Source of data to be used:	Local measurements
Value of data applied for the purpose of calculating expected emission reductions in section B.5	9.24
Description of measurement methods and procedures to be applied:	The electricity delivered to the grid is monitored by the project owner. Hourly aggregated information will be used to determine the operating margin CO_2 emission factor.
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 extremely low level of uncertainty). Hourly information provided by project participants can be weekly aggregated and crosschecked with the Reports issued by CCEE.
Any comment:	For the purpose of estimative, it was considered a constant energy generation by the plant. Hourly generation of electricity by the plant will be monitored and used to calculate the operating margin CO_2 emission factor.

Data / Parameter:	$EF_{EL,DD,h}$
Data unit:	tCO_2/MWh
Description:	CO_2 emission factor for power units in the top of the dispatch order in hour *h* in year *y*
Source of data to be used:	Brazilian DNA website (http://www.mct.gov.br/index.php/content/view/317399.html#ancora)
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Large amount of data. Please refer to the ERs calculation spreadsheet attached to the PDD.
Description of measurement methods and procedures to be 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 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*".
QA/QC procedures to	-

be applied:	
Any comment:	For the purpose of the emission reductions estimation 2008 data was. This was the most recent publicly available information at the time the request for renewal of the crediting period was submitted to the DOE.

Data / Parameter:	Cap_{PJ}
Data unit:	W
Description:	Installed capacity of the hydro power plant after the implementation of the project activity
Source of data to be used:	ANEEL Resolution nr. 410 dated June 29th, 2001 available at http://www.aneel.gov.br/cedoc/dsp2001410.pdf
Value of data applied for the purpose of calculating expected emission reductions in section B.5	12,440,000
Description of measurement methods and procedures to be applied:	-
QA/QC procedures to be applied:	-
Any comment:	-

Data / Parameter:	A_{PJ}
Data unit:	m^2
Description:	Area of the single or multiple reservoirs measured in the surface of the water, after the implementation of the project activity, when the reservoir is full
Source of data to be used:	ANEEL's Geo-referenced Information Systems of the Electric Sector
Value of data applied for the purpose of calculating expected emission reductions in section B.5	330,000
Description of measurement methods and procedures to be applied:	-
QA/QC procedures to be applied:	-
Any comment:	-

B.7.2 Description of the monitoring plan:

>>

The monitoring plan of the emission reductions by the project activity is in accordance with the procedures set by the methodology "AMS-I.D - *Grid connected renewable electricity generation*".

The project will proceed with the necessary measures for the power control and monitoring. Together with the information produced by CCEE, it will be possible to monitor the power generation of the project and the grid power mix. Information about power generation and energy supplied to the grid are controlled by the Chamber of Electric Energy Commercialization CCEE (from the Portuguese *Câmara de Comercialização de Energia Elétrica*). CCEE makes feasible and regulates the electricity energy commercialization. Hence, the energy monitored by the project owner can be cross checked using the Reports issued by CCEE.

There are two energy meters (principal and backup) model SAGA 1000, used for electricity measurement, which are in accordance with the specifications of the regulatory agencies of the country and are located at the substation. Meters are bidirectional. The measurement is redundant, so that, in case the first meter fails, the second automatically replaces it. These meter´s recalibration are scheduled to occur every two years, the recalibration procedures will be executed by a specialized metrology company that will be hired to this specific purpose.

Pesqueiro Energia S.A. is also be responsible for the maintenance of the monitoring equipments located at the plant (the ones located in the substation, that are under the local concessionary responsibility[17]), for dealing with possible monitoring data adjustments and uncertainties, for review of reported results/data, for internal audits of GHG project compliance with operational requirements and for corrective actions. Yet, it is also responsible for the project management, as well as for organising and training of the staff in the appropriate monitoring, measurement and reporting techniques.

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

>>

Date of completing the final draft of this baseline section *(DD/MM/YYYY): 30/09/2010.*

Name of person/entity determining the baseline:

Company: ECOPART ASSESSORIA EM NEGÓCIOS EMPRESARIAIS LTDA.
Address: Rua Padre João Manoel, 222
São Paulo - SP
ZIP code 01411-000
Brazil
Tel: +55 (11) 3063-9068
Fax: +55 (11) 3063-9069

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:

>>

27/01/2003

[17] COPEL, from Portuguese “Companhia Paranaense de Energia”.

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

>>
25 y – 0m

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

C.2.1. Renewable crediting period

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

>>
27/01/2010

Note: This Project Design Document corresponds to the *second* crediting period of the proposed CDM project activity, being the *first* crediting period from 27/01/2003 to 26/01/2010.

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:

>>

The proponent of any project that involves the construction, installation, expansion, and operation of any polluting or potentially polluting activity or any activity capable of causing environmental degradation is required to secure a series of permits from the respective state environmental agency. In addition, any such activity requires the preparation of an environmental assessment report, prior to obtaining construction and operation permits. Three types of permits are required. The first is the preliminary permit (*Licenca Prévia* or L.P.) issued during the planning phase of the project and which contains basic requirements to be complied with during the construction, and operating stages. The second is the construction permit (*Licença de Instalação* or L.I.) and, the final one is the operating permit (*Licenca de Operação* or L.O.).

Pesqueiro Energia S/A has the authorization issued by ANEEL to operate as an independent power producer (resolution nº476 – 06/12/2000) and has also the exploitation right of the small hydro Pesqueiro.

The preparation of an Environmental Impact Assessment is compulsory to obtain the construction and the operation licenses. In the process a report containing an investigation of the following aspects was prepared:

- Impacts to climate and air quality.
- Geological and soil impacts.
- Hydrological impacts (surface and groundwater).
- Impacts to the flora and animal life.
- Socio-economical (necessary infra-structure, legal and institutional, etc.).

The project has the necessary environmental and construction licenses. The operating permit/license were issued by the state environmental institute, IAP (Instituto Ambiental do Paraná), on February 05th, 2009. L.O. nº 17892, valid until February 05th, 2013.

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:

>>

No major environmental impacts were identified as a consequence of the construction and operation of the plant. As mentioned in the previous section the plant posses all the necessary environmental permits.

SECTION E. Stakeholders' comments

>>

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

>>

For the renewal of the crediting period this procedure is not applicable.

E.2. Summary of the comments received:

>>

For the renewal of the crediting period this procedure is not applicable.

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

>>

For the renewal of the crediting period this procedure is not applicable.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Organization:	Pesqueiro Energia S. A.
Street/P.O.Box:	Estrada Geral Ponta Grossa- Itararé
Building:	
City:	Jaguariaíva
State/Region:	Paraná
Postfix/ZIP:	84200-000
Country:	Brazil
Telephone:	+55 (43) 535-6764
FAX:	
E-Mail:	pesqueiro@eletrorural.com.br
URL:	
Represented by:	
Title:	Economic Coordinator
Salutation:	Mr.
Last Name:	Oliveira
Middle Name:	César
First Name:	Rosmir
Department:	
Mobile:	
Direct FAX:	
Direct tel:	+55 (42) 2341134
Personal E-Mail:	rosmir@eletrorural.com.br

Organization:	Ecopart Assessoria em Negócios Empresariais Ltda.
Street/P.O.Box:	Rua Padre João Manoel 222
Building:	
City:	São Paulo
State/Region:	São Paulo
Postfix/ZIP:	01411-000
Country:	Brazil
Telephone:	+55 (11) 3063-9068
FAX:	+55 (11) 3063-9069
E-Mail:	
URL:	
Represented by:	Mrs. Melissa Sawaya Hirschheimer
Title:	
Salutation:	Mrs.
Last name:	Hirschheimer
Middle name:	Sawaya
First name:	Melissa
Department:	
Mobile:	
Direct FAX:	+55 (11) 3063-9069

Direct tel:	+55 (11) 3063-9068
Personal e-Mail:	focalpoint@eqao.com.br

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. Koji Ikeda
Title:	-
Salutation:	Mr.
Last name:	Ikeda
Middle name:	-
First name:	Koji
Department:	Environmental Group, Corporate Social Responsibility Div.
Mobile:	-
Direct FAX:	+(81 82) 523-6185
Direct tel:	-
Personal e-Mail:	TGLOENV@pnet.energia.co.jp / 476434@pnet.energia.co.jp

Organization:	CM Capital Markets Holding S.A.
Street/P.O.Box:	Calle Ochandiano, 2
Building:	-
City:	Madrid
State/Region:	-
Postfix/ZIP:	28.023
Country:	Spain
Telephone:	-
FAX:	-
E-Mail:	-
URL:	www.capi.es
Represented by:	Mr. Alberto Pérez Antuña
Title:	Director Energy and Carbon Department
Salutation:	Mr.
Last name:	Antuña
Middle name:	Pérez
First name:	Alberto
Department:	-
Mobile:	-
Direct FAX:	-
Direct tel:	+(34) 915 096 260

Personal e-Mail:	Alberto.Perez@cmcapitalmarkets.es

Organization:	Trading Emissions PLC
Street/P.O.Box:	Hope Street
Building:	-
City:	-
State/Region:	Douglas
Postfix/ZIP:	IM1 1AP
Country:	Isle of Man, British Isles
Telephone:	-
FAX:	-
E-Mail:	-
URL:	-
Represented by:	Mr. Philip Scales
Title:	-
Salutation:	Mr.
Last name:	Scales
Middle name:	-
First name:	Philip
Department:	-
Mobile:	-
Direct FAX:	+44 - 1624 - 681392
Direct tel:	+44 - 1624 - 681250
Personal e-Mail:	eb@tradingemissionsplc.com

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

No public funding was and will be used in the present project.

Annex 3

BASELINE INFORMATION

This section was intentionally left blank. For baseline information, please refer to sections B.4. and B.5. above.

Annex 4

MONITORING INFORMATION

This section was intentionally left blank. For details about the monitoring plann of the proposed project activity, please refer to section B.7.2. above.