‘CLEAN DEVELOPMENT MECHANISM
PROJECT DESIGN DOCUMENT FORM (CDM-PDD)
Version 03 - in effect as of: 28 July 2006

CONTENTS

Annexes

SECTION A. General description of project activity

A.1 Title of the project activity:

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Project title: Ceran´s 14 de Julho Hydro Power Plant CDM Project Activity (hereafter referred to as "*HPP 14 de Julho*").

PDD Version number: 1.

Date: August 27, 2007.

A.2. Description of the project activity:

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The main objective of *HPP 14 de Julho* is to help meet the growing demand of electric energy in Brazil, due to economic growth and to increase the supply of electricity, while contributing to environmental, social and economic sustainability by increasing renewable energy's share of the total Brazilian (and the Latin American and Caribbean region) electricity consumption.

The countries within the Latin American and Caribbean region expressed their commitment by achieving a target of 10% of renewable energy in relation to the total used energy in the region. Through an initiative from the Ministers of the Environment in 2002 (UNEP-LAC, 2002), a preliminary meeting was held at the World Summit for Sustainable Development in Johannesburg, also in 2002. In the final Implementation Plan, no specific targets or timeframes were stated; however, its importance was recognized for achieving sustainability in accordance with the Millennium Development Goals[1].

The Brazilian electric sector privatization process initiated in 1995 was undertaken expecting adequate tariffs and better prices for the generators. It drew the attention of investors for possible alternatives that were unavailable in the centrally planned electricity market. At the end of the 90's, a strong increase in demand coupled with a under-average increase in installed capacity caused the supply rationing/crisis from 2001/2001. One of the solutions the government offered was flexible legislation favoring small-scale independent electric energy producers. Furthermore, occasional eligibility according to the Clean Development Mechanism from the Kyoto Protocol drew investors' attention to hydropower projects.

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

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[1] 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."

The *HPP 14 de Julho* will improve the supply of electricity when dispatching through the SIN (National Integrated System) with clean and renewable hydroelectric power, while contributing to the regional/local economic development.

Background

The first studies in the hydrographic basin of the Taquari/Antas River go back to the 30's, when the presently inactive company, *Empresas Elécticas Brasileiras S.A.* (Brazilian Electric Companies Inc.), proposed the construction of three hydropower plants in the basin.

In the 90's, CEEE – *Companhia Estadual de Energia Elétrica* (State Company of Electric Energy) utility companies in the state of Rio Grande do Sul carried out several investigative studies of the basin's hydro potential, culminating in the identification of 57 sites with powers varying from one to 130 MW. On the Antas River, specifically, 20 sites were selected, among them Castro Alves, Monte Claro and *14 de Julho (figure 1)* with 130 MW, 130 MW and 100 MW of installed power, respectively.

Composed of *HPP 14 de Julho*, HPP Monte Claro and HPP Castro Alves, the Antas River Energy Complex is situated mid-stream on the Antas River, in the Northeastern region of the state of Rio Grande do Sul, serving the cities of Bento Gonçalves, Veranópolis, Cotiporã, Nova Roma do Sul, Nova Pádua, Flores de Cunha, and Antonio Prado.

Figure 1 – *HPP 14 de Julho.*, downstream works. (Source: Ceran)

1. **Escape Channel**
2. **Substation Yard**
3. **Access tunnel to the Power House – Downstream-Upstream interconnection**

HPP 14 de Julho will initiate commercial operation according to the following schedule:

Activities	**Date**
▪ Construction Beginning	01/10/2004
▪ Begin concreting the strong house	01/09/2006
▪ Lower the 1st turbine rotor	01/04/2008
▪ Begin operation of 1st hydro generator unit	01/07/2008
▪ Begin operation of 2nd hydro generator unit	01/09/2008

Table 1: *HPP 14 de Julho* Schedule (Source: CERAN and Concession Contract ANEEL)

A.3. Project participants:

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The credit owner and Project CDM´s Focal Point of *HPP 14 de Julho*, the private company *Companhia Energética Rio das Antas* is the author and responsible entity for all the project activities related to management, approving, registering, monitoring, measurement and reporting.

Name of Party involved (*) ((host) indicates a host Party)	Private and/or public entity(ies) project participants (*) (as applicable)	Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No)
Brazil (host)	Private Entity: CERAN (*Companhia Energética Rio das Antas*)	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 2 – Private and public parties and entities involved in the activity

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

This project was developed under the responsibility of CERAN. All the activities are being developed in and limited to Brazil.

The following is a brief description about CERAN:

CERAN (*Companhia Energética Rio das Antas*)

In November 2000, the Consortium consisting of CPFL - *Geração de Energia S.A., CEEE - Companhia Estadual de Energia Elétrica,* from the state of Rio Grande do Sul, and *DESENVIX S.A*. was declared the winner of the Brazilian Power Regulatory Agency (ANEEL – *Agência National de Energia Eléctrica*) acquisition contract, according to Auction Notice *Nº 03/2000*, referring to the Concession Request for implantation and operation of the hydropower sites on the Antas River in the state of Rio Grande do Sul.

Giving sequence on that process, on January 11th, 2001, CERAN - *Companhia Energética Rio das Antas*, a close corporation, was founded. Nowadays CERAN has the following shareholders´ structure:

- CPFL Geração de Energia S.A.: 65%
- CEEE – Companhia Estadual de Energia Elétrica: 30%
- Desenvix S.A.: 5%

The company's social objective is to implant and operate the hydropower sites on the Antas River Energy Complex. The Complex consists of the *Monte Claro*, *Castro Alves* and *14 de Julho* Power Plants.

The Concession Contract nº 08/2001 for the Use of Public Property was signed on March 15th, 2001. It conferred Ceran the rights to establishment and operation of the hydroelectric uses mentioned above, for 35 years.

The operation of the three Power Plants will represent an increase of 360 megawatts in the installed power of Rio Grande do Sul. This means, approximately, 10% of the current demand of electric power of the State.

In October 2001, FEPAM – State Foundation of Environmental Protection (*Fundação Estadual de Proteção Ambiental*) authorized the Preliminary License for the three *HPP 14 de Julho* enterprises. The *HPP 14 de Julho* Installment License was authorized on July 11th, 2002.

Projects as *HPP 14 de Julho* are associated to the intensive use of labor during the phase of construction of the Power Plant, besides the future operation teams and maintenance. In 2007 3.228 people's were worked in Ceran Complex´s works, of which 1,238 were allocated in *HPP 14 de Julho*.

A.4. Technical description of the project activity:

A.4.1. Location of the project activity:

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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:

>> Bento Gonçalves, Cotiporã and Veranópolis.

A.4.1.4. Detail of physical location, including information allowing the unique identification of this project activity (maximum one page):

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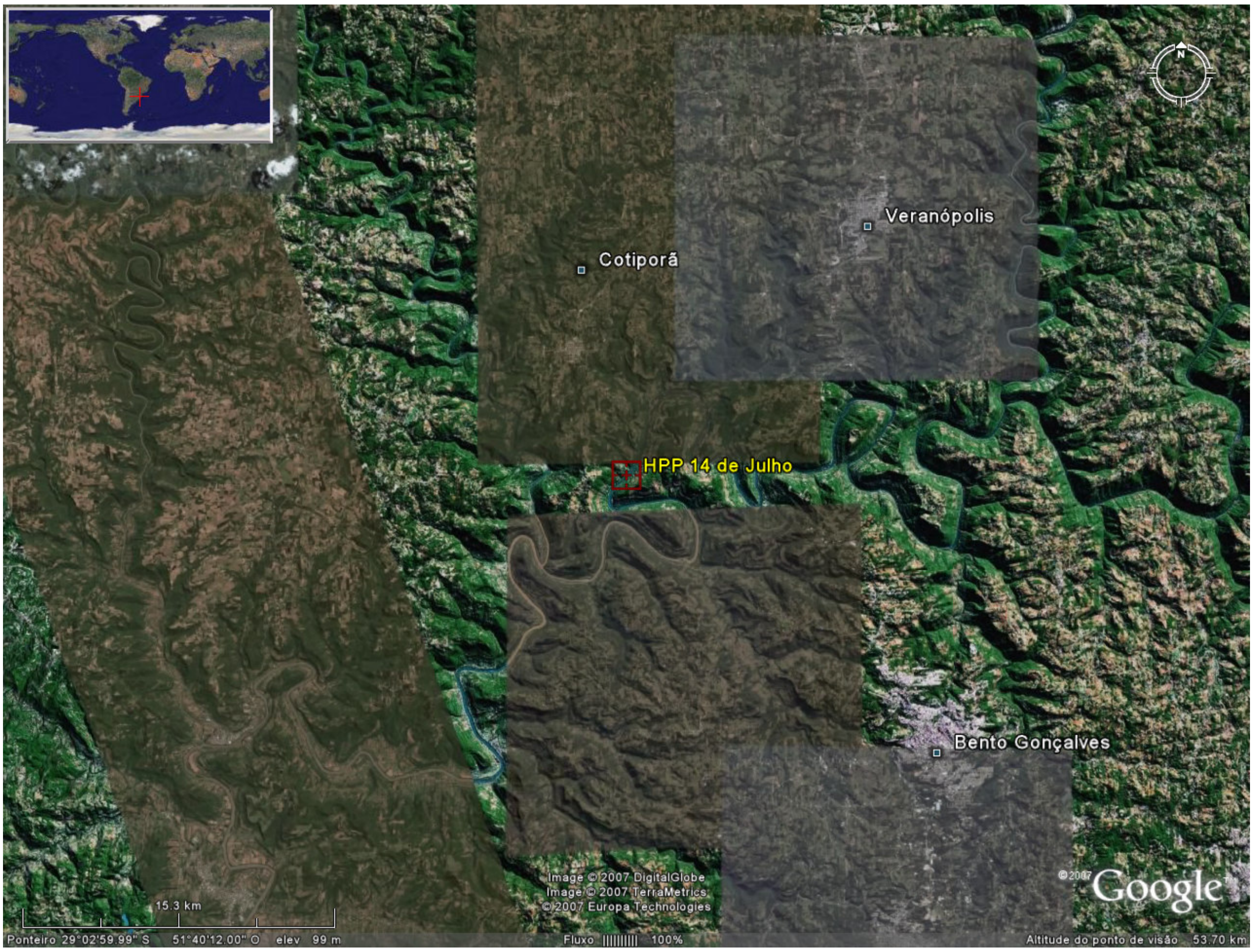

Figure 2 – Location *HPP 14 de Julho* (Source: Google Earth)

HPP 14 de Julho is located on the Antas River, the hydrographic basin of the Taquari-Antas river, between the cities of Bento Gonçalves (left bank), Cotiporã and Veranópolis (right bank) in the State of Rio Grande do Sul, South of Brazil.

The geographic coordinates of *HPP 14 de Julho* are:

- Latitude: 29°03' South
- Longitude: 51°40' West

The figure 2 shows the localization of *HPP 14 de Julho* under these coordinates.

A.4.2. Category(ies) of project activity:

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Sectoral Scope 1 – Energy Industries (Renewable Source)

A.4.3. Technology to be employed by the project activity:

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HPP 14 de Julho will exploit the Antas River water to generate electricity of 100 MW of installed capacity. This run-of-river[2] project has a small reservoir of 5.07 km^2, and complies with Brazilian regulations for HPP projects.

Below are the principal parameters of *HPP 14 de Julho*:

[redacted]

Table 3 – Technical Description of the *HPP 14 de Julho* Project

Summarizing the table 2, the facility description is as follows:

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[2] Unlike traditional hydroelectric facilities, which flood large areas of land, run of river projects do not require a big damming of water. Instead, some of the water is diverted from a river, and sent into a pipe called a penstock. The penstock feeds the water downhill to a generating station. The natural force of gravity creates the energy required to spin the turbines that in turn generate electricity. The water leaves the generating station and is returned to the river without altering the existing flow or water levels.

- 33.50 m waterfall for a total installed power of 100 MW (2 Kaplan turbines of nominal power of 51.8 MW each), and the yearly firm electric energy output of 438,000 MWh annual (assured power of 50 MW averages). The first Kaplan turbine will start its operation on July 1st, 2008. The second turbine will begin its operation on September 1st, 2008.

- Reservoir size is 5.07 km² and the gross power density is 19.72 W/m^2.

The figures 3.1 to 3.5 are detaching the work process of *HPP 14 de Julho*. (Source: CERAN).

Figure 3.1 – Power House – Suction Structure Construction – Source: CERAN

Figure 3.2 – Power House – Turbines well – Source: CERAN

Figure 3.3 – Spillway – Source: CERAN

Figure 3.4 – Water intake – Source: CERAN

Figure 3.5 – Upstream and Downstream works – Source: CERAN

A.4.4 Estimated amount of emission reductions over the chosen crediting period:

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Using the ex-post emission factor of the baseline calculated presented at the item B.7.1, the complete implementation of the *HPP 14 de Julho Project,* connected to the South Brazilian interconnected grid, will generate an yearly average estimated reduction of **245,493 tCO_{2e}** and a total reduction of **1,718,454 tCO_{2e}** during the first 7-year-period, described in the table below:

Year	**Annual estimation of emission reductions in tonnes of tCO_2e**
***2008**	106,646
2009	247,853
2010	247,853
2011	247,853
2012	247,853
2013	247,853
2014	247,853
****2015**	124,689
Total estimated reductions (tonnes of CO_2e)	**1,718,454**
Total number of crediting years	**7**
Annual average over the crediting period of estimated reductions (tonnes of CO_{2e})	**245,493**

*2008 accounts the generation from July to December (from July/1/2008 to Dec/31/2008)
**2015 accounts 6 months of generation (from Jan/1st/2015 to June/30/2015)

Table 4 – Estimation of emissions reductions of the *HPP 14 de Julho* Project

A.4.5. Public funding of the project activity:

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The parties involved in Annex I for the project activities solicited no public funding.

SECTION B. Application of a baseline and monitoring methodology

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

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- Baseline methodology: ACM0002 – "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", version 6, May 19th, 2006.
- Monitoring methodology: ACM0002 – Consolidated monitoring methodology for zero emissions grid-connected electricity generation from renewable sources", version 6, May 19th, 2006.
- Tool for Demonstration and Assessment of Additionality, Version 3.

For more information about the methodology consult the following link:

http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html

B.2 Justification of the choice of the methodology and why it is applicable to the project activity:

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The methodology ACM0002 is applicable to grid-connected renewable power generation project activities under the following conditions:

- Applies to electricity capacity addition from:
  - Run-of-river hydro power plants; hydro power projects with existing reservoirs where the volume of the reservoir is not increased.
  - New hydro electric power projects with reservoirs having power densities (installed power generation capacity divided by the surface area at full reservoir level) greater than 4 W/m^2.
  - Wind Sources;
  - Geothermal sources;
  - Solar sources;
  - Wave and tidal sources.

  The methodology ACM0002 can be applied to *HPP 14 de Julho* due to the fact it is a new hydro electric power project with reservoir having power density equals 19.72 W/m^2, greater than 4 W/m^2 (also greater than 10 W/m^2). The reservoir density calculation is showed bellow:

  - **Power Density of the Reservoir =** Installed Power Generation Capacity ÷ Surface area at full reservoir level = 100 MW ÷ 5.07 km^2 **= 19.72 W/m^2** **(Formula 1 of PDD)**

- This methodology is not applicable to project activities that involve switching from fossil fuel to renewable energy at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site;

  Not applicable.

- The geographic and system boundaries for the relevant electricity grid can be clearly identified and information on characteristics of the grid is available;

  The ACM0002 can also be applied to the project due to the geographic data and the relevant electricity grid system limits can be clearly identified, as well the available information about the grid. Sources: ONS (www.ons.org.br): ANEEL (www.aneel.gov.br).

- Applies to grid connected electricity generation from landfill gas capture to the extent that it is combined with the approved "Consolidated baseline methodology for landfill gas project activities". (ACM0001).

  Not applicable.

B.3. Description of the sources and gases included in the project boundary

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The Greenhouse gas (GHG) emissions by the project activity are equal to zero ($PE_y = 0$), according to the ACM0002: **"(II) New Hydro electric power projects with reservoir, project proponents shall account for project emissions, estimated as follow:** If the power density of project is greater than $10W/m^2$, PE_y=0."

	Source	Gas	Included?	Justification / Explanation
Baseline	Electricity Generated to the Grid	CO_2	Included	In accordance with ACM0002 only the CO_2 emissions from the electricity generation must be taken into account.
		CH_4	Excluded	
		N_20	Excluded	

	Source	Gas	Included?	Justification / Explanation
Project Activity	Hydropower Electricity Generation	CO_2	Excluded	The reservoir power density of the project is 19.72 W/m^2 (formula 1), greater than $10W/m^2$, so GHGs from the project activities must not be considered (PE_y=0).
		CH_4	Excluded	
		N_20	Excluded	

Table 5 – Project Activities GHG Emissions

Project Boundaries

The project boundaries are defined by the emissions directed or directly affected by the project activities, construction and operation. It encompasses the geographic and physical site of the hydropower generation source, which is represented by the corresponding basin to the river of each project, close to the power plant and the interconnected grid.

Brazil is a country with great territorial dimensions and it is divided in five geographical macro-areas: North, Northeast, Southeast, South and Midwest. Thus electric energy generation, and consequently, transmission are concentrated in four subsystems: South, Southeast/Midwest and Northeast. Electric energy expansion was concentrated in two specific areas:

- North/Northeast: This region's electricity is basically supplied by the São Francisco River. There are seven hydropower plants on the river, with a total installed capacity of approximately 10.5 GW. Eighty percent of the Northern region is supplied by diesel fueled power plants;

- South/Southeast/Midwest: The majority of the electricity generated in the country is concentrated in this subsystem. These regions also concentrate 70% of GDP generation in Brazil. There are more than 50 hydropower plants generating electricity for this subsystem.

From 2006 on, the Brazilian Science and Technology Ministry (MCT), Energy and Mines Ministry (MME) and the National System Operation (ONS) have divided the subsystem South/Southeast/Midwest into two subsystems, South and Southeast/Midwest, to calculate the Emission Factors; those are available since January 2006 for investors and public to be consulted.

The boundaries of the subsystems are defined by the transmission capacity. The transmission lines between the subsystems are defined by the transmission capacity. The lack of transmission lines forces the concentration of generated electricity in each of the subsystems. Thus, the South interconnected subsystem of the Brazilian grid, where the project activity is located, is considered a boundary.

The *HPP 14 de Julho* is located in the South Subsystem.

B.4. Description of how the baseline scenario is identified and description of the identified baseline scenario:

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According to ACM0002, for project activities that do not modify or remodel an existing electricity generating plant, the baseline is as follows:

- "The electricity delivered to the grid by the project would have been generated another way by the operation of a grid-connected power plant and by the addition of new generating sources, reflected in the combined margin described in the item B.6.1 of the PDD".

In the absence of a project the electricity should continue to be generated by the present mix of generation operating for the grid. The *HPP 14 de Julho* generation will avoid GHG emissions for the South Subsystem, avoiding the electric power generation starting from the use of fossil fuels of the existing Thermal Power Plants, those generated around 19% of the total generated electric energy of the South Subsystem in 2006 (source: ONS).

Three alternatives for the project scenario are considered:

- Alternative 1: The proposed project activity without CDM: construction of a new plant for grid-connected renewable generation with 100 MW of installed capacity, implemented without considering the CDM funds.
    - This alternative could present barriers according to the additionality analysis presented in this PDD.

- Alternative 2: Construction of a new Coal Thermal Power Plant grid-connected non-renewable with 100 MW of installed capacity, due to the South of Brazil has the most of the coal reservoirs of the country.

- Alternative 3: Continuation of the present situation. Electricity would continue to be generated by the present generators operating for the grid.

The project meets all the prerequisites of "additionality" (see the application of "***Tool for the demonstration and assessment of Additionality – version 3"***) and demonstrates that the project would not occur in the absence of the CDM.

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 CDM project activity (assessment and demonstration of additionality):

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The *HPP 14 de Julho* is a project for generating greenhouse gas (GHG) emission free power and will offer reductions in GHG emissions by replacing fossil fuel burning Thermo Power plant generation that, in other ways, would be supplying the interconnected grid.

As Kartha et al. (2002) affirmed: "the central issue of the challenge of the baseline for electricity projects clearly resides in determining the 'avoided generation' or that which would have occurred without the CDM or another GHG mitigation project. The fundamental question is if the avoided generation is in the 'build margin' (or rather, substituting a facility that would have otherwise been constructed) and/or in the 'operating margin' (or rather, affecting the operation of present and/or future plants)."

The baseline emission factor is calculated as a combined margin, consisting in the combination of the factors of the build margin and the operating margin. In order to determine the emission factors of the build margin, an electric system of the project is defined as being a physical extension of the plants that could be dispatched without significant restrictions in transmission. Similarly, an interconnected electric system is defined as a system that is interconnected by transmission lines to the electric system of the project and in which hydropower plants can dispatch without significant restrictions in transmission.

The approved consolidated baseline methodology ACM0002 – "Consolidated baseline methodology for grid-connected power generation from renewable sources" is applied to increases in electric capacity from run-of-river hydropower plants, included in the project activity proposal. The baseline scenario considers the electricity that would be generated in another way by grid-connected power plant operation and by the addition of new generation sources.

The reduction in CO_2 emissions by the project activity hydropower plant results from the change from fossil fuel burning Thermo Power generators, which would be supplying the interconnected grid in another way.

The ***additionality*** of the project activity should be demonstrated and evaluated using the most recent version of “Tool for Demonstration and Assessment of Additionality” accepted by the CDM – Executive Board, available on the CDM website of UNFCCC. The most recent version of this tool is the version 3.

The following steps are necessary for demonstrating and evaluating of the additionality of Project Ceran, *HPP 14 de Julho*:

- The project activity must be after January 1st 2000.

  The beginning of the *HPP 14 de Julho* construction was initiated on 01/10/2004, accomplishing this requirement;

- Evidence that the project was seriously considered in the decision of continuing with the project activity.

  The project sponsor began to evaluate the carbon market potential before the acquisition contract process for the *14 de Julho* hydropower employments. During the year 2000 the principal shareholder of Ceran, CPFL, contacted consulting companies and specialists to evaluate potential CDM revenues.

Step 1. Identification of alternatives to the project activity according to current laws and regulation

Sub-step 1a. Define alternatives to the project:

1. The realistic alternatives to the project activity are:

    - Continuation of the present situation. Electricity would continue to be generated by the present generators operating for the grid;

    - Construction of a new Coal Thermal Power Plant grid-connected non-renewable with 100 MW of installed capacity, due to the South of Brazil has the most of the coal reservoirs of the country;

    - The proposed project activity without CDM: construction of a new plant for grid-connected renewable generation with 100 MW of installed capacity, implemented without considering the CDM funds.

Sub-step 1b. Compliment with the applicable laws and norms:

1b.2. The alternative(s) shall be in compliance with all mandatory applicable legal and regulatory requirements, even if these laws and regulations have objectives other than GHG reductions.

Market Trends

The market trends show that the project activity and the alternative scenarios are widely observed in the Country and they are under the ANEEL (National Agency of Electric Energy) norms and regulation. The website of FEPAM (State Foundation of Environment) (http://www.fepam.rs.gov.br/) should also be visited. There the licenses of projects like the project activity *HPP 14 de Julho* and the alternative scenarios will be found.

According to ANEEL, the scenario of South Brazilian subsystem is the follow[3]:

The South Brazilian Subsystem is formed by three States: Rio Grande do Sul, Santa Catarina and Paraná. They have about 30% of the total of Installed Capacity of the Brazilian Electric System.

The projects activity like *HPP 14 de Julho* (HPP) represents 86.16% of the enterprises in operation, 89.85% of the enterprises under construction and 30.19% of the granted enterprises those didn't started to be constructed yet. (Source: Aneel)

The alternative scenario projects activity like Coal Thermal Power Plants (TPP) represents 11.65% of the enterprises in operation, 25.83% of the granted enterprises those didn't started to be constructed yet. (Source: Aneel)

It is worthwhile to point out that most of the reservations of mineral coal are in the south area of the Brazil.

- Coal Mines Localization: 100% in the South (Source: MME)
    - 0.28% in Paraná
    - 9.64% in Santa Catarina and
    - 90.08% in the Rio Grande do Sul

Norms and Regulation

Brazilian Electric Sector: LEGISLATION and INSTITUTIONS (Source: CCEE website[4])

The following figure presents a diagram of the institutions that are active in the Brazilian Electric Sector:

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3 http://www.aneel.gov.br/aplicacoes/ResumoEstadual/ResumoEstadual.asp

4 CCEE: http://www.ccee.org.br/cceeinterdsm/v/index.jsp?vgnextoid=15e6a5c1de88a010VgnVCM100000aa01a8c0RCRD

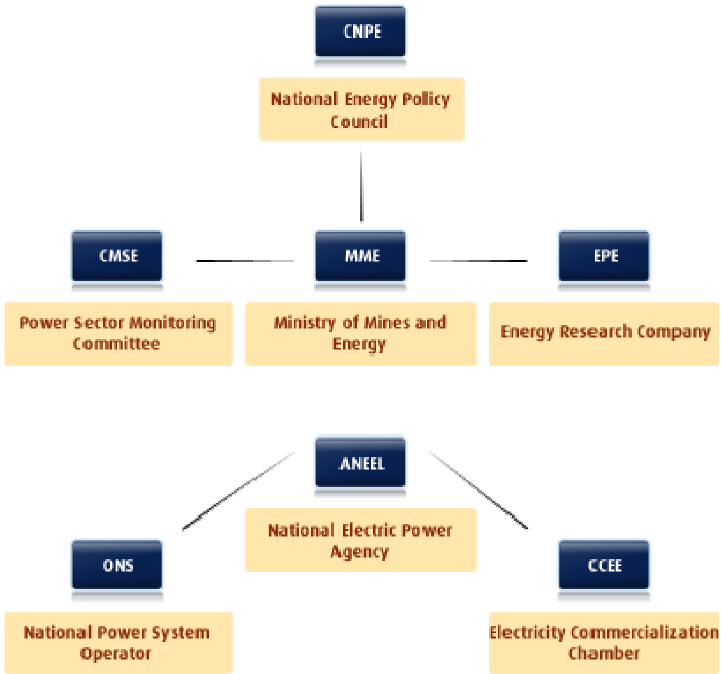

Figure 5 – Brazilian Electric Sector Institutions Chart

Legislation

Both alternatives are according to the Brazilian norms and regulations of the mentioned institutions above. There is not an imposition by any of these legislation and regulations obligating the construction of a Thermal or a Hydroelectric Power Plant.

Conclusions:

The project activity and the alternative scenarios follows all the Brazilian norms and regulations and them can also be observed as being tendencies of Brazilian market.

1b.3. If an alternative does not comply with all mandatory applicable legislation and regulations, then show that, based on an examination of current practice in the country or region in which the law or regulation applies, those applicable legal or regulatory requirements are systematically not enforced and that noncompliance with those requirements is widespread in the country. If this cannot be shown, then eliminate the alternative from further consideration.

Not applicable.

1b.4. If the proposed project activity is the only alternative amongst the ones considered by the project participants that is in compliance with mandatory regulations with which there is general compliance, then the proposed CDM project activity is not additional.

Not applicable

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SATISFIES/PASSES – Go to Step 2

Step 2. Investment analysis

Determine whether the proposed project activity is economically or financially less attractive than at least one other alternative, identified in step 1, without the revenue from the sale of certified emission reductions (CERs). To conduct the investment analysis, use the following sub-steps:

Sub-step 2a. Determine appropriate analysis method

Determine whether to apply simple cost analysis, investment comparison analysis or benchmark analysis (sub-step 2b). If the CDM project activity generates no financial or economic benefits other than CDM related income, then apply the simple cost analysis (Option I). Otherwise, use the investment comparison analysis (Option II) or the benchmark analysis (Option III).

Benchmark analysis (Option III) will be used to analyse the *HPP 14 de Julho* Project Activities.

Sub-step 2b – Option III. Apply benchmark analysis

Identify the financial indicator:

- Shareholders IRR will be used as project financial indicator and as reference to represent the standard returns in the market the Brazilian interest rate will be used, known as *SELIC* (Special System of Clearance sale and of Custody).

SELIC description

SELIC - Special System for Settlement and Custody (Sistema Especial de Liquidação e de Custódia)

SELIC is a great computerized system, under the responsibility of the Central Bank of Brazil and of the National Association of the Institutions of the Open Markets, since 1980, when it was created. The Committee of National Monetary Politics (COPOM) stipulates SELIC Target that can be defined as the average rate of the daily financings, with ballast in federal titles, select in the Selic System, which is in force for the whole period among ordinary meetings of the Committee.

The SELIC rate is cleaned in the SELIC System and obtained by the calculation of the considered and adjusted medium tax of the financing operations by one day, ballasted in federal public titles and studied in referred him system or in clearing house and clearance sale of assets. The operators of the institutions transfer SELIC, on line, the relative businesses to public titles involving banks that buy and that you/they sell those titles. Therefore, the Selic rate is the rate that remunerates the investors in the purchase business and sale of public titles.

The qualified financial institutions, such as banks, savings banks, society's brokers of titles and values furniture, distributing societies of titles and distributing societies of titles and values furniture are capable to make this kind of operation.

The most liquid government bond is the LFT (floating rate bonds based on the daily reference rate of the Central Bank of Brazil). As of January 2006, 37% of the domestic federal debt was in LFTs and had duration of one day (Source: Tesouro Nacional; www.tesouro.fazenda.gov.br). This bond rate almost follows almost the CDI rate, which is influenced by the SELIC rate, defined by COPOM.

The SELIC rate has been oscillating since 1999, from a minimum of 11.73% a.a. in July 2007 up to a maximum of 43.25% a.a. in January 2003 (Figure 5).

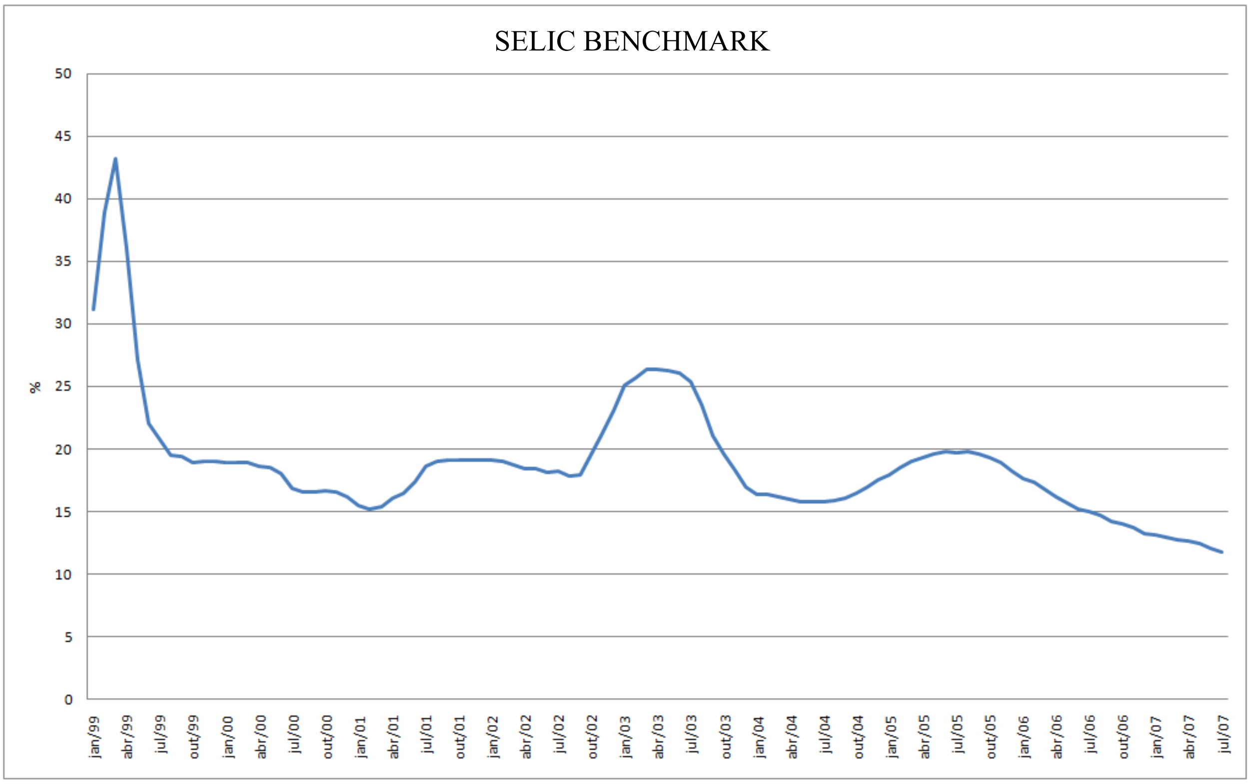


Figure 5 - SELIC rate evolution 1999 to 2007 (Source: Banco Central do Brasil)

The Ceran´s project analysis considering each Power Plant separately was made in November, 2003.

It will be considered the average average from January 1999 to October 2003 for the SELIC of 20.87%.

Sub-step 2c. Calculation and comparison of financial indicators

CDM's "Tool for the demonstration and assessment of additionality" was approved after the project started operations. In order to comply with that Tool, the financial analysis shown below was performed using the original assumptions for investment, revenues from sales of electricity and operational costs for the scenario without CDM related revenues.

For the following calculations the assumptions were:

Investment	203,307	R$ thousand	59,325.07	US$ thousand
Electricity Price	104.78	R$/MWh	30.58	US$/MWh
Operational Costs	3.6	R$/MWh	1.05	US$/MWh
Administrative Costs	1.52	R$/MWh	0.44	US$/MWh

Table 6 - Cash Flow Assumptions

Considering the following exchange quotation: 1 US$ - R$2.923, as of 25/Nov/2003 (Source: Banco Central do Brasil).

The values used here should be seen as a conservative projection of tariffs and prices. The upper limit of 438,000 GWh/year is the plant assured electric energy. During 2008, *HPP 14 de Julho* is expected to generate 191,260 GWh, because the plant will start operation on 1st July, 2008, with the start of just one turbine that will make available just 31 MW averages, and from September the second turbine will be started making available the full power 50 MW averages.

The table below show the Cash Flow, according to the assumptions on table 6:

COMPANHIA ENERGÉTICA RIO DAS ANTAS - Hydro Power Plant 14 de Julho - Balance Sheet *(R$ thousand, constants)*

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
TOTAL REVENUES	-	-	-	-		-	**42,389**	**45,251**	**45,251**	**45,251**	**45,251**	**45,251**	**45,251**	**45,251**	**45,251**	**45,251**	**45,251**
Operational total revenues					-		42,389	45,251	45,251	45,251	45,251	45,251	45,251	45,251	45,251	45,251	45,251
PIS - Social Integration Program	-	-	-	-			(699)	(747)	(747)	(747)	(747)	(747)	(747)	(747)	(747)	(747)	(747)
COFINS - Social Security Financing Contribution	-	-	-	-			(1,272)	(1,358)	(1,358)	(1,358)	(1,358)	(1,358)	(1,358)	(1,358)	(1,358)	(1,358)	(1,358)
CPMF							(161)	(172)	(172)	(172)	(172)	(172)	(172)	(172)	(172)	(172)	(172)
NET REVENUES	-	-	-	-	-	-	**40,257**	**42,975**	**42,975**	**42,975**	**42,975**	**42,975**	**42,975**	**42,975**	**42,975**	**42,975**	**42,975**
SECTORIAL CHARGES	-	-	-	-			(2,353)	(2,541)	(2,541)	(2,541)	(2,541)	(2,541)	(2,541)	(2,541)	(2,541)	(2,541)	(2,541)
RESEARCH & DEVELOPMENT	-	-	-	-			-	-	-	-	-	-	-	-	-	-	-
O&M COSTS	-	-	-	-			(1,456)	(1,555)	(1,555)	(1,555)	(1,555)	(1,555)	(1,555)	(1,555)	(1,555)	(1,555)	(1,555)
ADMINISTRATIVE COSTS	-	-	-	-			(615)	(656)	(656)	(656)	(656)	(656)	(656)	(656)	(656)	(656)	(656)
CONCESSION COSTS	-	-	-	-			(1,956)	(1,956)	(1,956)	(1,956)	(1,956)	(1,956)	(1,956)	(1,956)	(1,956)	(1,956)	(1,956)
DEPRECIATION				-			(4,047)	(4,047)	(4,047)	(4,047)	(4,047)	(4,047)	(4,047)	(4,047)	(4,047)	(4,047)	(4,047)
AMORTIZATION	-	-	-	-			(6,174)	(6,174)	(6,174)	(6,174)	(6,174)	(6,174)	(6,174)	(6,174)	(6,174)	(6,174)	0
PROFIT BEFORE INTERESTS AND INCOME TAX	-	-	-	-	-	-	**23,656**	**26,046**	**26,046**	**26,046**	**26,046**	**26,046**	**26,046**	**26,046**	**26,046**	**26,046**	**32,220**
FINANCIAL REVENUES																	
FINANCIAL EXPENSES (Loan servicing activity)	-	-	-	-			(6,550)	(18,558)	(16,547)	(14,709)	(12,824)	(10,891)	(8,909)	(6,839)	(4,742)	(2,612)	(543)
ACCRUED INTEREST	-	-	-	-			(11,878)	(3,017)	(1,872)	(1,671)	(1,462)	(1,246)	(1,023)	(699)	(456)	(235)	(45)
PROFIT BEFORE INTEREST ON OWN WORKING CAPITAL	-	-	-	-	-	-	**5,228**	**4,471**	**7,627**	**9,666**	**11,760**	**13,909**	**16,114**	**18,508**	**20,848**	**23,199**	**31,632**
INTERESTS OVER WORKING CAPITAL																	
PROFIT BEFORE INCOME TAX	-	-	-	-	-	-	**5,228**	**4,471**	**7,627**	**9,666**	**11,760**	**13,909**	**16,114**	**18,508**	**20,848**	**23,199**	**31,632**
INCOME TAX	-	-	-	-			(1,307)	(1,118)	(1,907)	(2,417)	(2,940)	(3,477)	(4,029)	(4,627)	(5,212)	(5,800)	(7,908)
SOCIAL CONTRIBUTION	-	-	-	-			(471)	(402)	(686)	(870)	(1,058)	(1,252)	(1,450)	(1,666)	(1,876)	(2,088)	(2,847)
EARNINGS	-	-	-	-	-	-	**3,450**	**2,951**	**5,034**	**6,380**	**7,762**	**9,180**	**10,635**	**12,215**	**13,760**	**15,312**	**20,877**
Shareholder - Cash Flow Assessment																	
Capital Increase	(6,659)	(1,323)	-	(15,533)	(25,036)	(20,194)	-	(992)	(282)	-	-	-	-	-	-	-	-
Dividends	-	-	-	-	-	-	#######	-	-	633.39	#######	#######	#######	#######	#######	#######	########
Capital Reduction	-	-	#######	-	-	-	#######	-	-	-	-	-	-	-	-	-	-
SHAREHOLDERS CASH-FLOW	#######	#######	#######	########	########	########	#######	(992.06)	(281.56)	633.39	#######	#######	#######	#######	#######	#######	########

	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
TOTAL REVENUES	**45,251**	**45,251**	**45,251**	**45,251**	**45,251**	**45,251**	**45,251**	**45,251**	**45,251**	**45,251**	**45,251**	**45,251**	**45,251**	**45,251**	**45,251**	**45,251**	**45,251**	**45,251**	**11,313**
Operational total revenues	45,251	45,251	45,251	45,251	45,251	45,251	45,251	45,251	45,251	45,251	45,251	45,251	45,251	45,251	45,251	45,251	45,251	45,251	11,313
PIS - Social Integration Program	(747)	(747)	(747)	(747)	(747)	(747)	(747)	(747)	(747)	(747)	(747)	(747)	(747)	(747)	(747)	(747)	(747)	(747)	(187)
COFINS - Social Security Financing Contribution	(1,358)	(1,358)	(1,358)	(1,358)	(1,358)	(1,358)	(1,358)	(1,358)	(1,358)	(1,358)	(1,358)	(1,358)	(1,358)	(1,358)	(1,358)	(1,358)	(1,358)	(1,358)	(339)
CPMF	(172)	(172)	(172)	(172)	(172)	(172)	(172)	(172)	(172)	(172)	(172)	(172)	(172)	(172)	(172)	(172)	(172)	(172)	(43)
NET REVENUES	**42,975**	**42,975**	**42,975**	**42,975**	**42,975**	**42,975**	**42,975**	**42,975**	**42,975**	**42,975**	**42,975**	**42,975**	**42,975**	**42,975**	**42,975**	**42,975**	**42,975**	**42,975**	**10,744**
SECTORIAL CHARGES	(2,541)	(2,541)	(2,541)	(2,541)	(2,541)	(2,541)	(2,541)	(2,541)	(2,541)	(2,541)	(2,541)	(2,541)	(2,541)	(2,541)	(2,541)	(2,541)	(2,541)	(2,541)	(635)
RESEARCH & DEVELOPMENT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
O&M COSTS	(1,555)	(1,555)	(1,555)	(1,555)	(1,555)	(1,555)	(1,555)	(1,555)	(1,555)	(1,555)	(1,555)	(1,555)	(1,555)	(1,555)	(1,555)	(1,555)	(1,555)	(1,555)	(389)
ADMINISTRATIVE COSTS	(656)	(656)	(656)	(656)	(656)	(656)	(656)	(656)	(656)	(656)	(656)	(656)	(656)	(656)	(656)	(656)	(656)	(656)	(164)
CONCESSION COSTS	(1,956)	(1,956)	(1,956)	(1,956)	(1,956)	(1,956)	(1,956)	(1,956)	(1,956)	(1,956)	(1,956)	(1,956)	(1,956)	(1,956)	(1,956)	(1,956)	(1,956)	(1,956)	(1,956)
DEPRECIATION	(4,047)	(4,047)	(4,047)	(4,047)	(4,047)	(4,047)	(4,047)	(4,047)	(4,047)	(4,047)	(4,047)	(4,047)	(4,047)	(4,047)	(3,802)	(3,802)	(3,802)	(3,802)	(3,802)
AMORTIZATION	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PROFIT BEFORE INTERESTS AND INCOME TAX	**32,220**	**32,220**	**32,220**	**32,220**	**32,220**	**32,220**	**32,220**	**32,220**	**32,220**	**32,220**	**32,220**	**32,220**	**32,220**	**32,220**	**32,465**	**32,465**	**32,465**	**32,465**	**3,798**
FINANCIAL REVENUES																			
FINANCIAL EXPENSES (Loan servicing activity)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ACCRUED INTEREST	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PROFIT BEFORE INTEREST ON OWN WORKING CAPITAL	**32,220**	**32,220**	**32,220**	**32,220**	**32,220**	**32,220**	**32,220**	**32,220**	**32,220**	**32,220**	**32,220**	**32,220**	**32,220**	**32,220**	**32,465**	**32,465**	**32,465**	**32,465**	**3,798**
INTERESTS OVER WORKING CAPITAL																			
PROFIT BEFORE INCOME TAX	**32,220**	**32,220**	**32,220**	**32,220**	**32,220**	**32,220**	**32,220**	**32,220**	**32,220**	**32,220**	**32,220**	**32,220**	**32,220**	**32,220**	**32,465**	**32,465**	**32,465**	**32,465**	**3,798**
INCOME TAX	(8,055)	(8,055)	(8,055)	(8,055)	(8,055)	(8,055)	(8,055)	(8,055)	(8,055)	(8,055)	(8,055)	(8,055)	(8,055)	(8,055)	(8,116)	(8,116)	(8,116)	(8,116)	(949)
SOCIAL CONTRIBUTION	(2,900)	(2,900)	(2,900)	(2,900)	(2,900)	(2,900)	(2,900)	(2,900)	(2,900)	(2,900)	(2,900)	(2,900)	(2,900)	(2,900)	(2,922)	(2,922)	(2,922)	(2,922)	(342)
EARNINGS	**21,265**	**21,265**	**21,265**	**21,265**	**21,265**	**21,265**	**21,265**	**21,265**	**21,265**	**21,265**	**21,265**	**21,265**	**21,265**	**21,265**	**21,427**	**21,427**	**21,427**	**21,427**	**2,507**
Shareholder - Cash Flow Assessment																			
Capital Increase	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dividends	########	########	########	########	########	########	########	########	########	########	########	########	########	########	########	########	########	########	#######
Capital Reduction	4,046.75	4,046.75	4,046.75	4,046.75	4,046.75	4,046.75	4,046.75	4,046.75	4,046.75	4,046.75	4,046.75	4,046.75	4,046.75	4,046.75	3,801.86	3,801.86	3,801.86	3,801.86	#######
SHAREHOLDERS CASH-FLOW	########	########	########	########	########	########	########	########	########	########	########	########	########	########	########	########	########	########	#######

Table 7 - The 20 year analysis period corresponds to the average length of analysis in the electric sector.

Results:

INTERNAL RATE OF RETURN (IRR)	**11.59%**
SELIC (AVERAGE OF 1999-2003)	**20.87%**
DIFFERENCE	**-9.28%**

Table 8 – Project Results IRR x Benchmark

The cash flow above was made on November 2003. According to the results the UHE 14 de Julho, the Shareholders IRR was under the benchmark SELIC. The difference between them was about 9%, considering that the average of the SELIC in the period between 1999 and 2003 was about 21%. One recently analysis (July 2007) shows that the Shareholders' IRR decreased to 8%, even being under the benchmark of the period (12%). One of the reasons of it was due to the geological questions on the region those were not possible to be previewed, so it was necessary a higher investment, which made a IRR reduction. This shows that without CER revenues, the project would reach lower rates of return than the benchmark rate, concluding that:

- Sub-step 2.c – 8b (ACM0002): The financial benchmark, if Option III (benchmark analysis) is used. If the CDM project activity has a less favourable indicator (e.g. lower IRR) than the benchmark, then the CDM project activity *cannot be considered as financially attractive.*

Sub-step 2d. Sensitivity analysis

The three main variables that might affect the project's finance are:
- Electricity revenues
- Operational Costs
- Administrative costs

The table below summarizes the sensitivity results:

[redacted]

Table 9 – Project Sensibility analysis

According to the sensitivity analysis the CDM project are unlikely to be financially attractive due to its IRR are lower than benchmark. The average SELIC for the period (Jan/1999 – Oct/2003) was 20.87%.

According to the Addicionality Tool, the expected outcome from the step 2 is the follow:

"If after the sensitivity analysis is concluded that the proposed CDM project activity is unlike to be the most financially attractive (as per step 2c -8a) or is unlikely to be financially attractive (as per step 2c – 8b), then proceed to Step 4 (Common practice analysis). If the project participants so wish, they may apply the step 3 (Barrier Analysis) as well."

SATISFIES/PASSES – Go to Step 4

Step 3. Barrier analysis

This step will not be considered. **Continue to Step 4**

Step 4. Common practice analysis

Sub-step 4a. Analyze other activities similar to the proposed project activity, and

It can be observed that in the Region South, where the project *HPP 14 de Julho* is located, there are activities similar the project activities.

Follow a summary of the enterprises under operation, constructions and granted, in the State of Rio Grande do Sul:

Enterprises in Operation			
Type	Quantity	Power (kW)	%
CGH	28	17,524	0.26
EOL	3	150,000	2.26
PCH	24	153,716	2.32
UHE	11	4,673,650	70.41
UTE	22	1,643,225	24.75
Total	**88**	**6,638,115**	100

Table 10.1– Enterprises in Operation in Rio Grande do Sul (Source: ANEEL – August 2007)

Enterprises under Construction			
Type	Quantity	Power (kW)	%
PCH	5	115,500	9.62
UHE	3	1,085,000	90.38
Total	**8**	**1,200,500**	100

Table 10.2– Enterprises in Construction in Rio Grande do Sul(Source: ANEEL – August 2007)

Granted Enterpresis between 1998 and 2004 (The construction hasn´t started)			
Type	Quantity	Power (kW)	%
CGH	9	6,297	0.22
EOL	25	1,153,512	40.73
PCH	16	266,318	9.4
UHE	4	487,000	17.2
UTE	7	918,625	32.44
Total	**61**	**2,831,752**	100

Table 10.3– Granted Enterprises in Rio Grande do Sul (Source: ANEEL – August 2007)

Types of Enterprises description:

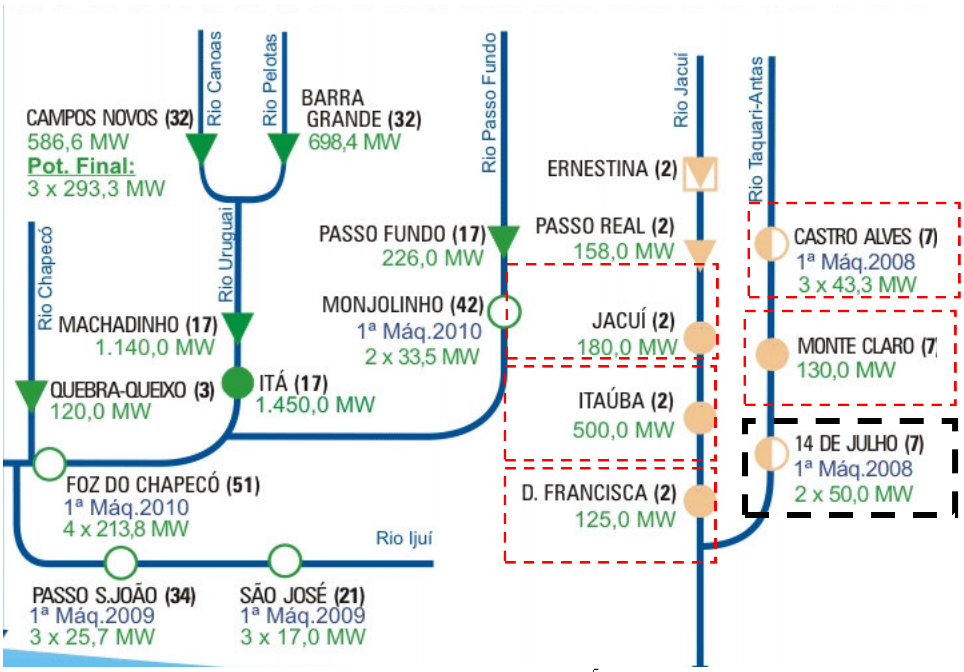
- CGH (Hydro Power Plant Central Generation)
- EOL (Wind Power Plant)
- PCH (Small Hydro Power Plant)
- UHE (Hydro Power Plant - HPP)
- UTE (Thermal Power Plant)

Tables 10.1 to 10.3 above show that there are similar activities occurring in the region of *HPP 14 de Julho*, as follows:

- 70.41% of the operating projects are Hydro Power Plants, as *HPP 14 de Julho*;
- 90.38% of the projects under constructions are HPP;
- 32.44% of the granted projects those didn´t started to be constructed yet are HPP.

But *HPP 14 de Julho* has some differences between the similar projects (Hydro Power Plants, run-of-river, Installed Capacity around 130 MW). These differences will be showed next.

The picture 6 is showing the Power Plants next to *HPP 14 de Julho*.



Picture 6 - Description of the plants near *HPP 14 de Julho*[5], with almost the same Installed Capacity. (Source: ONS)

	Run-of-River
	With reservoir

Legend of Picture 6 – (if the circle or the triangle is white it means that the HPP will start operation in the future. A half white means it is already under construction and the fulfilled are the HPP those started operation).

The Hydro Power Plants near *HPP 14 de Julho* and with almost the same installed capacity are:

- HPP Jacuí – 180 MW – Companhia Estadual de Energia Elétrica – Run-of-river
- HPP Passo Fundo – 226 MW – Tractebel Energia S/A – with reservoir
- HPP Passo Real – 158 MW – Companhia Estadual de Energia Elétrica – with reservoir
- HPP Monte Claro - 130 MW – CERAN – Run-of-river
- HPP Castro Alves – 130 MW – CERAN – Run-of-river
- HPP Dona Francisca – 125 MW – Dona Francisca Energética S/A; Companhia Estadual de Energia Elétrica – Run-of-river

Sub-step 4b. Discuss similar options that are occurring:

The growing demands requested by the environmental organs have been provoking great delay in the approval of new projects of hydroelectric generation. This males the projects as *HPP 14 de Julho* having a faster approval, due to it has a smaller environmental impact. See the following descriptive brief:

HPP 14 de Julho is different from the other plants, as it can be observed in the figure 7

[5] http://www.ons.org.br/conheca_sistema/pop/pop_diagrama_esquemat_usinas.aspx

The difference among the quota of water intake in the reservoir and the quota where are located the generating units (Power house) is based, fundamentally, in the topography of the land of the area where Rio of the Tapirs is loacted. This way, the construction of a adductor tunnel in the rock avoids the construction of a dam of a larger height.

An HPP, as the case of *HPP 14 de Julho*, with the general arrangement as the illustration below, provokes smaller environmental impacts (due to smallest flooded area), if compared to the HPPs with the same potency installed that have a system water intake/generation system close to the dam.

The following picture schematizes the general arrangement of *HPP 14 de Julho*:

.

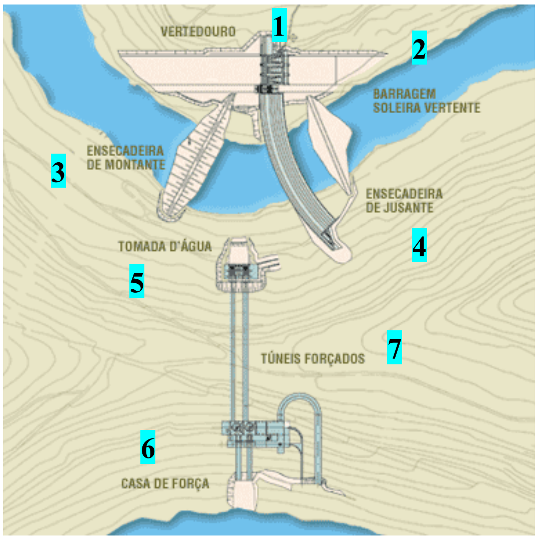


Figure 7 – General Arrangement of HPP 14 de Juhlo

1) Spillway
2) Dam with sill slope
3) Upstream cofferdam
4) Downstream cofferdam
5) Water intake
6) Power House
7) Forced Tunnels

One of the reasons of the project's IRR to have been below the reference tax and smaller being than the IRR of the similar projects can be attributed to smallest capacity of generation of incomes for the fact of the smallest installed potency and of the respective insured energy. Besides, for the fact of being Complexo CERAN's last Plant to enter into operation and the concession period is the same of the other Plants, it makes the income smaller than the others.

HPP Monte Claro and HPP Castro Alves, also belonging CERAN also requested CERs, to improve a little the financial results. Both Plants are similar to *HPP 14 de Julho* in terms of power and they are run-of-rive too.

SATISFIED/APPROVED – Project is ADDITIONAL

B.6. Emission reductions:

B.6.1. Explanation of methodological choices:

>>

The project activity is a run-of-river hydropower project interconnected to the Brazilian electric grid, through the South Subsystem. The project meets all the requirements of “additionality” (see the application of “Tool of Additionality” 3 to follow) and shows that the project would not occur in the absence of the CDM.

In a period of restructuring the entire electric market (generation, transmission and distribution), as is the case in Brazil, investment, uncertainty, is the main barrier to small and medium projects for renewable electric energy generation. In this scenario, the new projects compete with the existing plants (operating margin) and with new projects (build margin), which normally attract the attention of the financial market. The build and operating margins were used to calculate the emissions factor for the interconnected grid.

The ACM0002 (version 6) methodology, for the generation of interconnected grid electricity from renewable sources, uses derived margins that were applied to the context of the project activity by determining emissions factors from the South subsystem of the Brazilian interconnected grid (electric system that is interconnected by transmission lines to the project electric system, and in which the plants can be dispatched without significant restrictions in transmission.

According to the approved selected methodology (ACM0002, 2006), the baseline emission factor (EF_y) is calculated as the combined margin (*CM*), which consists of the combination of factors of the operating margin (*OM*) and the build margin (*BM*). In order to determine the emissions factors of the build margin and the operating margin, a project electric system is defined as being the physical extension of the plants that can be dispatched without significant restrictions on transmission. Similarly, an interconnected electric system is defined as being an electric system that is interconnected by transmission lines to the project electric system, in which the plants can be dispatched without significant restrictions in transmission.

According to ACM0002 (version 06), a baseline emission factor (EF_y) is calculated as follows:

STEP 1 - Calculate the operating margin factor(s), based on one of the following methods

(a) Simple operating margin
(b) Simple adjusted operating margin
(c) Dispatch data analysis operating margin
(d) Average operating margin.

The build margin calculated by the dispatch data analysis must be the first choice and it will be followed for the *HPP 14 de Julho* Calculations. The method is described as follow:

(c) *Dispatch Data Analysis OM*. The Dispatch Data OM emission factor (*EFOM,Dispatch Data,y*) is summarized as follows:

$$EF_{OM,DispatchData,y} = \frac{E_{OM,y}}{EG_y}$$

(Formula 6 of ACM0002)

Where *EGy* is the generation of the project (in MWh) in year *y*, and *EOM.y* are the emissions (tCO2) associated with the operating margin calculated as

$$E_{OM,y} = \sum_h EG_h \cdot EF_{DD,h}$$

(Formula 7 of ACM0002)

Where *EGh* is the generation of the project (in MWh) in each hour *h* and $EF_{DD,h}$ is the hourly generation weighted average emissions per electricity unit (tCO2/MWh) of the set of power plants (*n*) in the top 10% of grid system dispatch order during hour *h*:

$$EF_{DD,h} = \frac{\sum_{i,n} F_{i,n,h} \cdot COEF_{i,n}}{\sum_n GEN_{n,h}}$$

(Formula 8 of ACM0002)

Where *F*, *COEF* and *GEN* are analogous to the variables described for the simple OM method above, but calculated on an hourly basis for the set of plants (*n*) falling within the top 10% of the system dispatch.

To determine the set of plants (*n*), obtain from a national dispatch center: a) the grid system dispatch order of operation for each power plant of the system; and b) the amount of power (MWh) that is dispatched from all plants in the system during each hour that the project activity is operating (*GENh*). At each hour *h*, stack each plant's generation (*GENh*) using the merit orders. The set of plants (*n*) consists of those plants at the top of the stack (i.e., having the least merit), whose combined generation (*Σ GENh*) comprises 10% of total generation from all plants during that hour (including imports to the extent they are dispatched).

STEP 2 – Calculate the build margin emission factor ($EF_{BM,y}$) since the generation pondered average emission factor (tCO_2e/MWh) from a sample of the centers *m*, as follows:

$$EF_{BM,y} = \frac{\sum_{i,m} F_{i,m,y} \cdot COEF_{i,m}}{\sum_m GEN_{m,y}}$$

(Formula 9 of ACM0002)

Where $F_{i,m,y}$, $COEF_{i,m}$ and $GEN_{m,y}$ are analogous to the variables described for the simple OM method above for plants *m*.

Project participants shall choose between one of the following two options. The choice among the two options should be specified in the PDD, and cannot be changed during the crediting period.
Option 1. Calculate the Build Margin emission factor EFBM,y ex-ante based on the most recent information available on plants already built for sample group m at the time of PDD submission. The sample group m consists of either the five power plants that have been built most recently, or the power plant capacity additions in the electricity system that comprise 20% of the system generation (in MWh) and that have been built most recently.7 Project participants should use from these two options that sample group that comprises the larger annual generation.

Option 2. For the first crediting period, the Build Margin emission factor EFBM,y must be updated annually ex-post for the year in which actual project generation and associated emissions reductions occur. For subsequent crediting periods, EFBM,y should be calculated ex-ante, as described in option 1 above. The sample group m consists of either the five power plants that have been built most recently, or the power plant capacity additions in the electricity system that comprise 20% of the system generation (in MWh) and that have been built most recently.8 Project participants should use from these two options that sample group that comprises the larger annual generation.

It will be used the **Option 2** for ***HPP 14 de Julho*** project.

STEP3. Calculate the baseline emission factor EF_y as the weighted average of the Operating Margin emission factor ($EF_{OM,y}$) and the Build Margin emission factor ($EF_{BM,y}$):

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

(Formula 10 of ACM0002)

Where the weights *wOM* and *wBM*, by default, are 50% (i.e., *wOM* = *wBM* = 0.5), and *EFOM,y* and *EFBM,y* are calculated as described in Steps 1 and 2 above and are expressed in tCO2/MWh.

Alternative weights can be used, as long as *wOM* + *wBM* = 1, and the guidance provided below is followed.

The weighted average applied by project participants should be fixed for a crediting period and may be revised at the renewal of the crediting period.

Guidance on selecting alternative weights

The following guidance provides a number of project-specific and context-specific factors for developing alternative operating and build margin weights to the above defaults. It does not, however, provide specific algorithms to translate these factors into quantified weights, nor does it address all factors that might conceivably affect these weights. In this case, project participants are suggested to propose specific quantification methods with justifications that are consistent with the guidance provided below. Given that it is unlikely that a project will impact either the OM or BM exclusively during the first crediting period, it is suggested that neither weight exceed 75% during the first crediting period.

Where the weights w_{OM} and w_{BM}, by standard, are 50% (or, $w_{OM} = w_{BM} = 0.5$). They can be used as alternative weights, if $w_{OM} + w_{BM} = 1$ and appropriate evidence is presented justifying the alternative weights.

According to MCT, MME and ONS the Brazilian electric subsystem is divided in four regions: South, Southeast/Midwest, Northeast and North. MCT will make available de emission factor data for each region.

Project Emissions

The project activity mainly reduces carbon dioxide through substitution of grid electricity generation with fossil fuel fired power plants by renewable electricity. The emission reduction *ERy* by the project activity during a giving year y is the difference between baseline emissions (*BEy*), project emissions (*PEy*) and emissions due to leakage (*Ly*), as follows:

$ERy = BEy - PEy - Ly$ (Formula 11 of ACM0002)

Where the baseline emissions (*BEy* in tCO_2) are the product of the baseline emissions factor (*EFy* in tCO_2/MWh) calculated in Step 3, times the electricity supplied by the project activity to the grid (*EGy* in MWh) minus the baseline electricity supplied to the grid in the case of modified or retrofit facilities ($EG_{baseline}$ in MWh) as follows:

$BEy = (EGy - EG_{baseline}) * EFy$ (Formula 12 of ACM0002)

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

(Copy this table for each data and parameter)

Data / Parameter:	Area
Data unit:	km^2
Description:	Reservoir surface area at maximum level
Source of data used:	CERAN
Value applied:	5.07
Justification of the choice of data or description of measurement methods and procedures actually applied :	It will be used to calculate the power density of the reservoir. It has impact on the applicability of the methodology and on the calculation of the Certified Emission Reductions of the project activities.
Any comment:	This data was measured once at the beginning of the project.

Data / Parameter:	Installed Capacity
Data unit:	MW
Description:	Project activity installed capacity
Source of data used:	Feasibility study
Value applied:	100
Justification of the choice of data or description of measurement methods and procedures actually applied :	It will be used to calculate the power density of the reservoir as the item above. It will be also used to calculate de Certified Emission Reductions of the project activity, due to the assured electric energy depend on this.
Any comment:	This value will not be altered.

B.6.3 Ex-ante calculation of emission reductions:

>>

CERs Calculation Sheet

	Emission Factor (tCO_2/MWh)												
Month	**Jan**	**Feb**	**March**	**Apr**	**May**	**June**	**July**	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**	
EF_{OM}	0.9074	0.9663	0.9719	0.9648	1.0027	0.9771	1.0236	1.0110	1.0273	0.8161	0.9667	0.8620	
EF_{BM}	0.1737	0.1737	0.1737	0.1737	0.1737	0.1737	0.1737	0.1737	0.1737	0.1737	0.1737	0.1737	
W_{OM}	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
W_{BM}	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
EF	**0.5405**	**0.5700**	**0.5728**	**0.5692**	**0.5882**	**0.5754**	**0.5986**	**0.5923**	**0.6005**	**0.4949**	**0.5702**	**0.5178**	
	Estimated Generation (MWh)												*TOTAL*
2008	-	-	-	-	-	-	22,630	22,630	36,500	36,500	36,500	36,500	**191,260**
2009	36,500	36,500	36,500	36,500	36,500	36,500	36,500	36,500	36,500	36,500	36,500	36,500	**438,000**
2010	36,500	36,500	36,500	36,500	36,500	36,500	36,500	36,500	36,500	36,500	36,500	36,500	**438,000**
2011	36,500	36,500	36,500	36,500	36,500	36,500	36,500	36,500	36,500	36,500	36,500	36,500	**438,000**
2012	36,500	36,500	36,500	36,500	36,500	36,500	36,500	36,500	36,500	36,500	36,500	36,500	**438,000**
2013	36,500	36,500	36,500	36,500	36,500	36,500	36,500	36,500	36,500	36,500	36,500	36,500	**438,000**
2014	36,500	36,500	36,500	36,500	36,500	36,500	36,500	36,500	36,500	36,500	36,500	36,500	**438,000**
2015	36,500	36,500	36,500	36,500	36,500	36,500	-	-	-	-	-	-	**219,000**
TOTAL	**255,500**	**255,500**	**255,500**	**255,500**	**255,500**	**255,500**	**241,630**	**241,630**	**255,500**	**255,500**	**255,500**	**255,500**	**3,038,260**
	Estimated CERs (tCO_2)												*TOTAL*
2008	-	-	-	-	-	-	13,547	13,405	21,918	18,063	20,812	18,901	**106,646**
2009	19,730	20,805	20,906	20,777	21,469	21,002	21,850	21,620	21,918	18,063	20,812	18,901	**247,853**
2010	19,730	20,805	20,906	20,777	21,469	21,002	21,850	21,620	21,918	18,063	20,812	18,901	**247,853**
2011	19,730	20,805	20,906	20,777	21,469	21,002	21,850	21,620	21,918	18,063	20,812	18,901	**247,853**
2012	19,730	20,805	20,906	20,777	21,469	21,002	21,850	21,620	21,918	18,063	20,812	18,901	**247,853**
2013	19,730	20,805	20,906	20,777	21,469	21,002	21,850	21,620	21,918	18,063	20,812	18,901	**247,853**
2014	19,730	20,805	20,906	20,777	21,469	21,002	21,850	21,620	21,918	18,063	20,812	18,901	**247,853**
2015	19,730	20,805	20,906	20,777	21,469	21,002	-	-	-	-	-	-	**124,689**
TOTAL	**138,108**	**145,633**	**146,341**	**145,439**	**150,285**	**147,016**	**144,649**	**143,126**	**153,426**	**126,440**	**145,687**	**132,305**	**1,718,454**

Table 11 – Ex-ante calculation of emission reductions

- **Emission Factor Calculation - *EFy***

EF_{OM} and EF_{BM} were given by the Brazilian Ministry of Science and Technology (MCT[6]). They were calculated under the method ***Dispatch data analysis operating margin*** described in the item B.6.1 of this PDD.

It was considered the default w_{OM} and w_{BM} (50% and 50% respectively) according to this methodology. It was also explain on item B.6.1 of this PDD.

The Emission Factor calculation was concluded using the formula 10 of ACM0002 (described on item B.6.1):

$$EF_y = EF_{OM} * w_{OM} + EF_{BM} * w_{BM} \textbf{ (formula 10 of ACM0002).}$$

It was used the same emission factors of 2006 to the following years for a estimative of CERs.

- **Estimated Generation Calculation – *EGy***

According to the Commercial Operational Schedule, described in the Concession Contract and its Additive[7], between CERAN and ANEEL, the following assured energy was estimated:

SCHEDULE	Assured Energy		
Commercial Operational Start	MWh average	MWh/year	MWh/month
01/jul/08	31	271.560	22.630
01/set/08	50	438.000	36.500

Table12 – Assured Energy of *HPP 14 de Julho*

For the calculation of table 11 it was taken into account the values above described.

- **Baseline Emissions Calculation – *BEy***

According to the formula 12 of ACM0002 (see item B.6.1),

$BEy = (EGy – EG_{baseline}) * EFy$ (Formula 12 of ACM0002)

[6] **MCT links**:

http://www.mct.gov.br/index.php/content/view/50958.html - Emission Factors (EF_{OM} and EF_{BM}) – Visited on 19th July 2007.

http://www.mct.gov.br/index.php/content/view/50965.html - Manual of the Emission Factor Calculations – Visited on 19th July 2007.

[7] **CERAN Concession Contract and Additive:**

http://www.aneel.gov.br/aplicacoes/Contrato/Documentos_Aplicacao/08_2001.pdf - Concession Contract

http://www.aneel.gov.br/aplicacoes/Contrato/Documentos_Aplicacao/1TA0108CERAN.pdf - Additive to the Concession Contract

According to the methodology ACM0002 *PEy*, *Ly* and $EG_{baseline}$ are zero. See the following reasons:

- *PEy* – see item **B.3**;

- Leakage (L_y) – "The main emissions potentially given rise to leakage in the context of electric sector projects are emissions arising due to activities such as power plant construction, fuel handling and land inundation. Project participants do not need to consider these emission sources as leakages in applying this methodology. Project activities using this baseline methodology shall not claim any credit for the project on account of reducing these emissions below the level of baseline scenario."

- $EG_{baseline}$ – The project is a new hydro power plant.

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

>>

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)
2007	0	106,646	0	106,646
2008	0	247,853	0	247,853
2009	0	247,853	0	247,853
2010	0	247,853	0	247,853
2011	0	247,853	0	247,853
2012	0	247,853	0	247,853
2013	0	247,853	0	247,853
2014	0	124,689	0	124,689
Total (tones of CO2e)	**0**	**1,718,454**	**0**	**1,718,454**

Table 13 – Summary of ex-ante estimative of emission reduction

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

>>

Approved consolidated monitoring methodology ACM0002 – "Consolidated monitoring methodology for generation of grid-interconnected electricity with zero emissions from renewable sources," version 06 on May 19, 2006.

This monitoring methodology must be used with the approved baseline methodology ACM0002 ("Consolidated baseline methodology for generation of grid-connected electricity with zero emissions from renewable sources"), and is applied to the increases in electric capacity from run-of-river hydropower plants.

The methodology is applicable to the project. It consists of the use of measurement equipment designed for registering or verifying the energy generated by the unit in both directions. This electric energy measurement is essential for verifying and monitoring the GHG emission reductions. The monitoring plan (item B.7.2) permits the GHG emissions formula generated by the project in a direct manner, applying the baseline emissions factor.

Based on hydroelectric energy technology, the project emissions (*PEy*) are equal to zero; thus, formulas for the direct emissions are not necessary.

The indirect emissions can be consequences of the project construction, the transportation of materials and fuel and other upstream activities. The project does not require emissions reductions from these activities. Nevertheless, no significant leakages were identified from these activities.

The project emissions in the form of methane also can result from the construction and operation of a water reservoir if the biomass is permanently submerged in the process. The project activity is a run-of-river hydropower plant; however, there is only one small reservoir, having insignificant methane emissions resulting from the biomass decay.

Thus, no emissions source was identified and due to this, no data will be collected nor archived for these data.

B.7.1 Data and parameters monitored:

(Copy this table for each data and parameter)

Data / Parameter:	**Electric energy Generated (EG_y)**
Data unit:	MWh
Description:	Electric energy generated
Source of data to be used:	It will be used spreadsheets got every month directly of the meters with the hourly generation information. Monthly, the information will be confronted with the available generation spreadsheets at the website of CCEE.
Value of data applied for the purpose of calculating expected emission reductions in section B.5	438,000 (assured electric energy per year)
Description of measurement	See the description on item B.7.2.1.

methods and procedures to be applied:	
QA/QC procedures to be applied:	Uncertainty level of data is Low. These data will be used for calculate the emission reductions. The electricity generated will be monitored by the project participants and it will be checked by the available datasheets in the CCEE website (information comparison between operation data and CCEE reports).
Any comment:	

<table>
<tr><th>Data / Parameter:</th><th>Emission Factor (EFy)</th></tr>
<tr><td>Data unit:</td><td>tCO2/MWh</td></tr>
<tr><td>Description:</td><td>South Grid Emission Factor</td></tr>
<tr><td>Source of data to be used:</td><td>MCT</td></tr>
<tr><td>Value of data applied for the purpose of calculating expected emission reductions in section B.5</td><td>
<table>
<tr><th colspan="13">Emission Factor (tCO2/MWh)</th></tr>
<tr><td>Month</td><td>Jan</td><td>Feb</td><td>March</td><td>Apr</td><td>May</td><td>June</td><td>July</td><td>Aug</td><td>Sept</td><td>Oct</td><td>Nov</td><td>Dec</td></tr>
<tr><td>EF</td><td>0.5405</td><td>0.5700</td><td>0.5728</td><td>0.5692</td><td>0.5882</td><td>0.5754</td><td>0.5986</td><td>0.5923</td><td>0.6005</td><td>0.4949</td><td>0.5702</td><td>0.5178</td></tr>
</table>
</td></tr>
<tr><td>Description of measurement methods and procedures to be applied:</td><td>Ex-post emission factor will be calculated by MCT with the ONS data. The EF_y formula items, EF_{OM} and EF_{BM}, will be also monitored and calculated by MCT and ONS, with the Dispatch Data of the South Grid Subsystem.</td></tr>
<tr><td>QA/QC procedures to be applied:</td><td>Uncertainty level of data is Low.</td></tr>
<tr><td>Any comment:</td><td></td></tr>
</table>

<table>
<tr><th>Data / Parameter:</th><th>Emission Factor Operating Margin (EF_{OM})</th></tr>
<tr><td>Data unit:</td><td>tCO2/MWh</td></tr>
<tr><td>Description:</td><td>South Grid Emission Factor</td></tr>
<tr><td>Source of data to be used:</td><td>MCT</td></tr>
<tr><td>Value of data applied for the purpose of calculating expected emission reductions in section B.5</td><td>
<table>
<tr><th colspan="13">Emission Factor (tCO2/MWh)</th></tr>
<tr><td>Month</td><td>Jan</td><td>Feb</td><td>March</td><td>Apr</td><td>May</td><td>June</td><td>July</td><td>Aug</td><td>Sept</td><td>Oct</td><td>Nov</td><td>Dec</td></tr>
<tr><td>EF_{OM}</td><td>0.9074</td><td>0.9663</td><td>0.9719</td><td>0.9648</td><td>1.0027</td><td>0.9771</td><td>1.0236</td><td>1.0110</td><td>1.0273</td><td>0.8161</td><td>0.9667</td><td>0.8620</td></tr>
</table>
</td></tr>
<tr><td>Description of measurement methods and procedures to be applied:</td><td>Ex-post emission factor will be calculated by MCT with the ONS data. The EF_y formula items, EF_{OM} and EF_{BM}, will be also monitored and calculated by MCT and ONS, with the Dispatch Data of the South Grid Subsystem.</td></tr>
<tr><td>QA/QC procedures to be applied:</td><td>Uncertainty level of data is Low.</td></tr>
</table>

Data / Parameter:	**Emission Factor Build Margin (EF_{BM})**
Data unit:	tCO2/MWh

Description:	South Grid Emission Factor
Source of data to be used:	MCT
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Emission Factor (tCO2/MWh) Month: Jan 0.1737; Feb 0.1737; March 0.1737; Apr 0.1737; May 0.1737; June 0.1737; July 0.1737; Aug 0.1737; Sept 0.1737; Oct 0.1737; Nov 0.1737; Dec 0.1737 (EF_{BM})
Description of measurement methods and procedures to be applied:	Ex-post emission factor will be calculated by MCT with the ONS data. The EF_y formula items, EF_{OM} and EF_{BM}, will be also monitored and calculated by MCT and ONS, with the Dispatch Data of the South Grid Subsystem.
QA/QC procedures to be applied:	Uncertainty level of data is Low.

Emission Factor (tCO2/MWh)

Month	Jan	Feb	March	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
EF_{BM}	0.1737	0.1737	0.1737	0.1737	0.1737	0.1737	0.1737	0.1737	0.1737	0.1737	0.1737	0.1737

B.7.2 Description of the monitoring plan:

>>

Generated Electric energy

The monitoring will be done according to the defined procedures for Approved Consolidated Monitoring Methodology ACM0002 - "Monitoring Methodology consolidated for the electricity generation to an interconnected grid with zero emissions from renewable sources."

Generation Data Collection Procedure

RESPONSIBILITIES

- Maintenance area - responsible for the accomplishment of the data server backup and generation of the monthly spreadsheets of energy generation of the following meters:
    - Generating Units Meters - gross energy;
    - Main Metering and Rear guard Meter - net energy dispatched to the SIN.
- Operation Area - responsible for the consolidation of the monthly spreadsheets of generation and supervision of the SCDE System, through the consistence analysis of the collected data and monitoring of the System operation.

PROCESS DESCRIPTION

I – Generation Data Collection Procedure through SCDE (system of energy data collection)

SCDE is a system administered by CCEE, responsible for the daily collection and treatment of the generation and consumption data of the SIN measurement points.

The data collected by SCDE are transferred for the computation system SCL for ends of Accountancy and Financial Clearance sale with base in the Rules and Procedures of Commercialization of CCEE.

The data collection is accomplished in a passive way, through Central Unit of Collection of Measurement (UCM). In this collection, the generation data are obtained directly of the meters and made available in files of format xml for each one of the meter. These files are generated through routines of work of UCM and transmitted automatically by the application Client SCDE. In case of reading unavailability of any measurement point, due to maintenances, commissioning or for any other reason, the methodology of data estimate will be used according to the item 14.3 of the Commercialization Procedure PdC ME.01.

The meters of net energy (main and rearguard) present the passive collection through UCM and the logical inspection (auditing) of the data through VPN.

The meters of gross energy (generating units) present the passive collection through UCM and the logical inspection (auditing) of the data through Dialed Line.

II - Data Consolidation Procedure:

The Maintenance Area, through a system technician, is responsible for generating, in the first useful day of every month, starting from consultation to the data base of the meters of gross and net energy, the spreadsheets with the generation data, consolidated hour the hour, regarding the previous month. The generated spreadsheets are filed in the Data Server in the directory G:\Operaçao\OPERAÇÃO\Registros SE - Medições Energia.

The Operation Department, through the Engineer of Operation, makes the consolidation of the generation data obtained and it totals the monthly amounts of generated energy.

Monthly, the Operation Supervisor sends to CPFL Brasil, contracted agent for CERAN for relationship with CCEE, the spreadsheets with the generated energy data for conference of the data and eventual adjustments in SCL that are done necessary.

Weekly, the Maintenance Area, through a system technician, accomplishes the backup of the Data Server (G) according to Procedure of Maintenance MPS 54 – Data Server Backup.

III – Confronting of the internal information of generation with the reports of a third part:

For ends of comparison of the information, monthly, the consolidated generation data consolidated and analyzed by the Engineer of Operation internally will be confronted with the available data in the spreadsheets made available in the system SCDE that supply the generation information hour the hour. Those spreadsheets are accessed through the site of CCEE.

In case it happens inconsistency in the internal data with the data obtained in CCEE, it will be generated a non-conformity report that will be verified CCEE close to the cause of the disagreement of the data.

IV – Data Storage:

The generation information, the internally generated and the spreadsheets generated through the site of CCEE, are stored by the Operation Department electronically in the folder G:\Operaçao\OPERAÇÃO\Registros IF - Medições Energia. The backup is weekly accomplished according to item II.

Emission Factors

These data will be supplied annually by MCT (www.mct.gov.br), described below:

CO_2 Emission Factors for the electric power generation in the National System of Brazil (SIN)

The CO_2 Emission Factors of the electric power generation verified in the National System (SIN) of Brazil are calculated from the registrations of generation of the dispatched plants centralized by the National Operator of the Electric System (ONS) and, especially, in the Thermo Electrical Plants. That information are necessary to the projects of renewable electric energy connected to the electric net and implanted in Brazil in the extent of the Mechanism of Clean Development (CDM) of the Protocol of Kyoto.

The systematic of calculation of the factors of emission of CO_2 was developed in cooperation between the Ministry of the Science and Technology (MCT) and the Ministry of Minas and Energy (MME), tends as base the guidelines of the methodology ACM0002, approved for Executive Council of CDM, in Bonn, Germany. ONS had to explain to the group the operative practices of SIN, regulated by ANEEL.

Following that systematic one, the CO_2 Emission Factors started to be calculated by ONS for the four subsystems of SIN (North, Northeast, Southeast/Midwest and South) from January of 2006 and it will be available to be consulted by the interested public and investors.

MCT supplies, besides the emission factors, a descriptive manual of the formulas used in the calculations of the factors.

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

>>

Data from the baseline study application and monitoring methodology finalization: August 27th 2007.

Responsible for the project and participant listed on Annex I with the contact information

- Vendolino Fischer / CERAN (Companhia Energética Rio das Antas)

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:

>>
01/10/2004 (Construction Beginning)

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

>>
31 years – 3 months – 13 days (from C.1.1)

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

C.2.1. Renewable crediting period

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

>>
01/07/2008

C.2.1.2. Length of the first crediting period:

>>
7 years

C.2.2. Fixed crediting period:

C.2.2.1. Starting date:

>>
Not applicable.

C.2.2.2. Length:

>>
Not applicable.

SECTION D. Environmental impacts

>>

D.1. Documentation on the analysis of the environmental impacts, including transboundary impacts:

>>

The growing global concern on sustainable resources is driving the requirement for more sensitive environmental management practices. Increasingly, this is reflected in legislation and policies around the world. In Brazil the situation is no different. The licensing policies and environmental rules are very demanding, in line with the best international practices.

In Brazil, the sponsor of any project that involves construction, installation, expansion or operation of any polluting or potentially pollutant activity or any other activity that may cause environmental decay is required to obtain a series of licenses from the pertinent environmental agency (federal and/or local, depending on the project).

To obtain all the environmental licenses, every the hydroelectric projects must mitigate the following impacts:

- Inundation of indigenous lands and slave historic areas – authorization for this depends on the National Congress resolution;
- Inundation of environmental preservation areas, legally defined as National Parks and Conserve Units;
- Inundation of urban areas or rural communities;
- Reservoirs where future urban expansion will occur;
- Elimination of natural patrimony;
- Expressive losses for other uses of water;
- Inundation of protected historic areas; and
- Inundation of cemeteries and other sacred locations.

The process begins with a previous analysis (preliminary studies) made by the local environmental department. After this, if the project is considered environmentally feasible, the sponsors have to prepare an Environmental Assessment, which is basically composed of the following information:

- Reasons for implementing the project;
- Description of the project, including information related to the reservoir;
- Preliminary Environmental Diagnosis, mentioning the main physical, biotic and anthropic aspects;
- Preliminary estimation of the project impacts; and
- Possible mitigating measures and environmental programs.

The result of these evaluations is the Preliminary License (PL), which reflects the positive understanding of the local environmental agency on the project environmental concepts.

The presentation of (a) additional information on the previous assessment; (b) a new simplified assessment; or (the Environmental Basic Project, is needed to obtain the installation license (IL), according to the resolution of the environmental agency informed on the PL.

The operation license (OL) is a result of pre-operational tests performed during the construction phase, carried out to verify if all the exigencies made by the local environmental agency were completed.

See below the history of the licenses:

- Preliminary License (PL) EIA/RIMA – Nº 00694/2001– DL
    - Issued in: 03/10/2001
    - Valid up to: 03/10/2002

- Renewing Preliminary License (PL) EIA/RIMA – Nº 00964/2002– DL
    - Issued in: 06/11/2002
    - Valid up to: 06/11/2003

- Installation License (IL) – Nº 00112/2004 – DL
    - Issued in: 04/02/2004
    - Valid up to: 31/05/2007

- **Renewing Installation License (IL) – Nº 00550/2007– DL**
    - **Issued in:.27/07/2007**
    - **Valid up to: 31/07/2009**
    - **File: http://eta.fepam.rs.gov.br:81/doclics/signed/262082_signed.pdf**

D.2. If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to support documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party:

>>

The environmental impact of the project activity is considered small. With the use of run-of-river hydroelectric facilities for generation of electricity, the project substitutes part of the obtained electricity of diesel, a finite fossil fuel.

The forecast is that the project activity will contribute to improve the provisioning of electricity and, at the same time, it will contribute to the sustainability environmental, social and economical.

The project has all of the environmental licenses and necessary installation satisfying several demands of the state environmental legislation - FEPAM (State Foundation of Environmental Protection of Rio

Grande do Sul) - and of the Brazilian electric section - ANEEL (National Agency of Electric power). All the three environmental licenses (LP, LI and LO) were emitted by FEPAM of the state of Rio Grande do Sul.

In the processes of license obtainment, reports were prepared containing the investigation of the following aspects, among other:

" Impacts in the climate and in the quality of the air.

" Geological impacts and in the soil.

" Impacts in the hydrology (underground water and of surface).

" Impacts in the flora and in the animal life.

" Socioeconomic (necessary infrastructure, legal and institutional aspects, etc.).

Other important aspect in the undertaking implementation was the dedicated study of the environmental viability starting from the elaboration of the Environmental Basic Project (PBA) that contemplates the mitigation of all of the identified environmental impacts in the EIA-RIMA. PBA has 27 specific programs divided in three great areas: physical, biotic and atrophic environmental, according to the follow:

" Physical environmental: climatic conditions monitoring; underground waters monitoring; characterization and monitoring of the stability of the marginal hillsides; monitoring limnologic and of the quality of the water; recovery of the degraded areas; investigation would mine; monitoring seismograph; monitoring hydrosedimentologic; control of the hydric pollution of the river of the Tapirs.

" Biotic environmental: cleaning of the reservoirs; monitoring and rescue of the ictiofauna; rescue, rescue and monitoring of the fauna; rescue, rescue and monitoring of the flora; reforestation; control of the macrófitas proliferation.

" Anthropic environmental: transferring of the population; monitoring of the reached population; monitoring of the public health; rescue of the patrimony historical, cultural, archeological and landscapist ; re-dimensioning and infrastructure reallocation; support to the municipal districts; decrease of losses and combat to the waste of energy; environmental education; social communication; administration of the reservoirs; environmental administration; support to the migrating population.

SECTION E. Stakeholders' comments

>>

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

>>

In addition to the stakeholders' comments, solicited for obtaining environmental licenses, the Brazilian Designated National Authority, "*Commissão Interministerial de Mudanças Globais do Clima*", solicits stakeholders' comments based on a translated version of the PDD and the validation report emitted by an authorized DOE according to Resolution No. 1, issued on September 11th, 2003, in order to provide the letter of approval.

The project proponents sent these letters to the stakeholders to solicit their comments while the project PDD remained open to comments during the validation stage on the CDM – Executive Board's website (http://cdm.unfccc.int/), since anyone can have access to the document mentioned coming from a legitimate source.

E.2. Summary of the comments received:

>>

The Brazilian DNA requests that the CDM projects must remain open for comments before validation. Thus, in addition to the UNFCCC global stakeholders' process comments, the project will also be open to local stakeholders' comments at the same time. Any comments will be disclosed after validation.

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

>>

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Organization:	CERAN (COMPANHIA ENERGÉTICA RIO DAS ANTAS)
Street/P.O.Box:	Av. Carlos Gomes, 300 – 8º andar – Bairro Boa vista
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City:	Porto Alegre
State/Region:	Rio Grande do Sul
Postfix/ZIP:	90480-000
Country:	Brazil
Telephone:	+55 11 3025.6700
FAX:	
E-Mail:	ceran@ceran.com.br
URL:	www.ceran.com.br
Represented by:	
Title:	Mr.
Salutation:	Fischer
Last Name:	Vendolino
Middle Name:	
First Name:	
Department:	
Mobile:	
Direct FAX:	
Direct tel:	
Personal E-Mail:	vfischer@ceran.com.br

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

No public funding coming from Annex I countries was or will be used in this project.

<u>Annex 3</u>

BASELINE INFORMATION

All information is presented in Section B.

The figure 8 shows the HPP 14 de Julho interconnection to the south subsystem of the SIN (National Interconnected System).

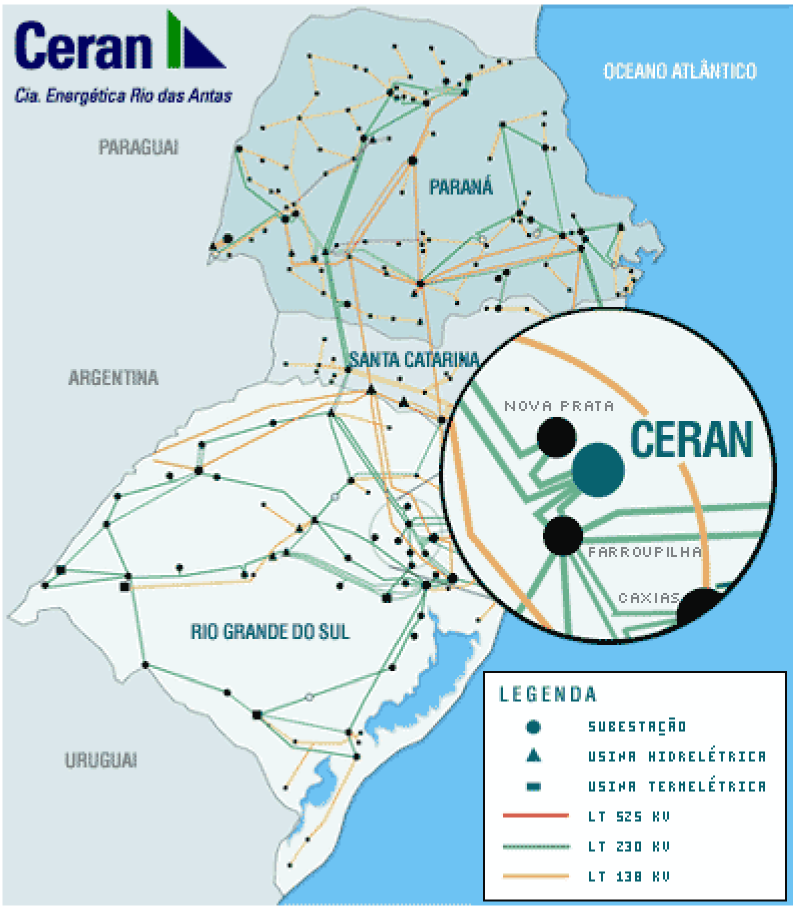

Figure 8– CERAN connection to the south subsystem of the SIN. Source: CERAN (www.ceran.com.br)

Furthermore, Bosi (2000) makes a solid argument in favor of having so-called multi-project baselines:

"For large countries with differing circumstances within their boarders and different power grids based on each region, multiproject baselines in the electric sector may need to be separated below the country-level to promote a reliable representation of what would have happened otherwise'".

Finally, it must be taken into account that although the systems are presently interconnected, the electric energy flow between the N-NE and the S-SE-CO systems is severely limited by the transmission line capacity. As such, only a fraction of the total electric energy generated in the two subsystems is sent from one side to the other. It is natural that this fraction may change its direction and magnitude (until reaching the transmission line capacity) depending on hydrological standards, the climate and other uncontrollable factors. However, this change must not represent a significant amount of electricity demand from each subsystem. One must consider that the integration between the Southeast and the Northeast systems was concluded only in 2004, e.g., if project proponents are coherent with the generation databank that they are available for use at the time of the PDD presentation for validation, a situation in which the flow of electricity between the subsystems was even more restricted must be considered.

Nowadays, the Brazilian electric system encompasses approximately 107.48 GW of installed capacity, with a total of 1,629 electricity generation enterprises. Of these, approximately 71.3% are hydroelectric plants, about 10.1 % are natural gas-fired generation plants, 4.03% are fuel and diesel oil plants, 3.1% are biomass sources (sugar cane bagasse, black liquor, wood, rice chaff and biogas agricultural waste), 1.9% are nuclear plants, 1.3% are mineral coal plants, and there are also 8.17 GW of installed capacity in the neighboring countries (Argentina, Uruguay, Venezuela, and Paraguay), which may dispatch electricity for the Brazilian grid. (http://www.aneel.gov.br/aplicacoes/capacidadebrasil/OperacaoCapacidadeBrasil.asp). In truth, this last capacity encompasses principally 6.3 GW of the Paraguayan part of *Itaipu Binacional*, a central hydropower plant operated in conjunction with Brazil and Paraguay, but whose electric energy almost entirely is sent to the Brazilian grid.

The approved methodology ACM0002 requires that the project proponents answer for all generation sources serving the system." In this way, when applying the methodology, the project proponents in Brazil must search for, and research, all the plants serving the Brazilian system.

Now, the MCT (Science and Technology Ministry – www.mct.gov.br), MME (Mines and Energy Ministry – www.mme.gov.br) and ONS (National System Operator – www.ons.org.br) have divided the Subsystem South/Southeast/Midwest into two: South and Southeast/Midwest, for effect of emission factor calculation, for CMD project activities. All the emission factor calculation and explanation documents can be found at MCT website: http://www.mct.gov.br/index.php/content/view/50862.html

MCT made available in its website the Emission Factor for the Subsystems Brazilian Grid separately.

The following tables show the Operating Margin and Build Margin factors:

- Operating Margin (EF_{OM})

South Subsystem

Average Month Factor (tCO2/MWh)												
2006	Month											
	Jan	Feb	March	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
	0.9074	0.9663	0.9719	0.9648	1.0027	0.9771	1.0236	1.0110	1.0273	0.8161	0.9667	0.8620

Daily Average Emission Factors (tCO2/MWh)													
2006		Month											
	Day	Jan	Feb	March	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
	1	0.9660	0.8929	1.0400	0.9444	0.9993	1.0100	1.1199	1.0276	0.9622	0.7591	1.0701	1.0877
	2	0.9160	0.8076	1.0446	0.9376	0.9201	0.9985	1.0949	1.0132	1.0007	0.8007	1.1068	1.1341
	3	0.8909	0.7897	1.0089	0.9667	0.9763	0.9890	1.0562	1.0069	1.0462	0.7775	1.1031	1.0891
	4	0.9151	0.8823	0.9904	0.9378	0.9688	0.8600	1.0142	1.0122	1.0331	0.8299	1.0611	0.9721
	5	0.8160	0.9312	1.0033	1.0531	0.9675	0.9775	1.0394	1.0001	1.0663	0.8139	1.0511	0.9441
	6	0.8946	0.9343	0.9669	0.9823	1.0021	1.0077	1.0531	1.0143	1.0713	0.7935	1.0256	1.0438
	7	1.0171	0.9768	1.0308	0.9619	1.0177	0.9811	0.9910	0.9712	1.0430	0.6796	1.0423	0.9083
	8	1.0143	0.8921	0.9578	0.9618	1.0046	0.9827	0.9900	0.9752	1.0590	0.5819	0.9633	0.8332
	9	0.8348	1.0073	0.9891	0.9693	1.0836	0.9892	1.0337	0.9409	1.0303	0.7555	0.9963	0.7647
	10	0.8565	1.0538	0.9911	1.0320	1.0357	0.8994	1.0102	1.0341	1.0446	0.7213	0.9780	0.8572
	11	0.8088	1.1049	0.9750	0.9887	1.0092	0.8822	1.0121	1.0315	1.0374	0.7321	1.0475	0.7998
	12	0.8836	1.0415	0.9598	1.0098	1.0168	0.9517	1.0214	1.0127	0.9514	0.6556	1.0275	0.7190
	13	0.9296	1.0340	0.9619	1.0029	1.0153	0.9911	1.0134	1.0166	1.0304	0.7037	0.9617	0.7559
	14	0.9741	1.0039	0.9245	0.9870	1.0433	1.0029	1.0129	0.8969	1.1121	0.6630	0.9751	0.7478
	15	0.9170	1.0193	0.9818	1.0076	1.0145	0.9942	1.0170	1.0266	1.0549	0.5925	1.0293	0.7328
	16	0.7970	1.0193	0.9986	1.0103	1.0113	1.0104	1.0498	0.9724	1.0238	0.6821	0.8720	0.7435
	17	0.8176	1.0265	0.9332	0.9288	1.0216	1.0147	1.0103	1.0123	1.0584	0.6861	0.7860	0.6837
	18	0.8801	1.0428	0.9753	0.8640	1.0209	0.9654	1.0213	1.0069	1.0524	0.6819	0.9863	0.7572
	19	0.9313	0.9944	0.9535	0.8541	1.0097	1.0222	1.0249	1.0468	1.0515	0.6868	1.0241	0.6960
	20	0.9206	1.0224	0.9637	0.9549	1.0106	1.0388	1.0205	1.0685	1.0412	0.9621	0.7323	0.7355
	21	0.9526	0.9855	0.9349	0.9844	1.0454	1.0058	1.0124	1.0782	0.9836	1.0694	0.8363	0.7061
	22	0.9269	0.8767	0.9626	0.9479	1.0196	0.9789	1.0086	1.0260	1.0314	1.0394	0.9141	0.6769
	23	0.9084	0.8652	0.9671	0.9362	1.0233	1.0055	1.0633	0.9682	1.0166	0.8089	0.8036	0.8184
	24	0.8873	0.9415	0.9571	0.9329	1.0317	0.9231	1.0089	0.9659	1.0569	0.8400	0.7396	1.1035
	25	0.9014	0.9491	0.9570	0.9231	1.0014	0.9324	0.9756	1.0266	1.0490	0.9968	0.8305	1.1985
	26	0.9063	1.0077	0.9326	0.9559	0.9803	0.9831	1.0179	1.0571	1.0254	0.8931	1.1325	1.0114
	27	0.9611	1.0203	0.8930	0.9598	0.9580	0.9838	1.0088	1.0319	0.9917	0.9208	0.9636	0.9003
	28	0.9724	1.0128	0.9465	1.0047	0.9868	0.9753	0.9923	1.0506	0.9593	0.9696	0.9454	0.8914
	29	0.9405		0.9669	0.9634	0.9788	1.0007	1.0136	1.0581	0.9999	1.0388	1.0240	0.8560
	30	0.9370		0.9800	0.9984	0.9898	0.9656	1.0379	1.0406	0.9606	0.9996	1.1494	0.9311
	31	0.9553		0.9790		0.9383		1.0403	0.9948		1.0641		0.9424

Table 14 – Operation Margin Factors

Source: MCT (http://www.mct.gov.br/index.php/content/view/50871.html - accessed on 20/June/2007)

- Build Margin (EF_{BM})

2006	Build Margin
Subsystem	(tCO2/MWh)
South	0.1737

Table 15 – Build Margin Factor

Source: MCT (http://www.mct.gov.br/index.php/content/view/50871.html - accessed on 20/June/2007)

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Annex 4

MONITORING INFORMATION

The “Consolidated monitoring methodology ACM0002” defines the monitoring procedures of the project activities.

According to the procedures defined by “Approved consolidated monitoring methodology ACM0002”- “Consolidated monitoring methodology for grid-connected electricity generation with zero emissions from renewable sources.”

All the procedures those will be used in the monitoring are described on the item B.7. Some additional information are the following:

Employees Qualification

The whole process of Training and Development of the CERAN’s employees is based on the crossing of the description of positions with the employee's profile and through the process of acting evaluation.

The implantation of the employees acting evaluation process happened in August of 2007. With base in the acting evaluation, it will be developed an Action Plan that seeks to help the employee in his development for the service of the function requirements. Besides, the company makes available the managers a formal procedure of training request.

Concomitantly to the formal process of Training and Development, CERAN follows the orientation of ONS in relation to the Operators Certification, according to the Operation Procedures Manual "RO-MP BR 04."

Some details of the Process of Measurement of Energy of CCEE:

The Commercialization Process

The Electric Power Commercialization Process takes place in pursuance to the parameters that have been established by Law 10848/2004, by Decrees 5163/2004 and 5.177/2004 (which instituted the CCEE) and by ANEEL’s Normative Resolution 109/2004, which instituted the Electric Power Commercialization Convention.

The business relationships between the Agents members of the CCEE are predominately regulated by electric power purchase and sale agreements, and all the agreements executed between the Agents within the context of the National Interconnected System must be recorded at CCEE. Said recording includes only the parties involved, the amounts of energy and the period of effectiveness; the prices for the electric power on the agreements are not recorded at CCEE, and they are used specifically by the parties involved during their bilateral settlements.

CCEE posts the differences between what has been produced or consumed and what has been contracted. The positive or negative differences are settled on the Short Term Market and are valorized according to the Spot Price (also called Price for the Settlement of Differences (PLD – Preço de Liquidação das Diferenças), set weekly for each load level, and for each submarket, having as basis the marginal cost to operate the system, which is limited by a minimum and by a maximum price.

Commensuration

As set forth by the Commercialization Convention, homologated by ANEEL's Resolution no. 109, dated October 26, 2004, the Electric Power Commercialization Center (CCEE) is responsible for providing the specifications, orientation and determination of aspects pertaining to the adaptation of the Billing Commensuration System (SMF), and for the implementation, operation and maintenance of the SCDE system (System for the Garnering of Electric Power Data), so as to render viable the garnering of data pertaining to electric power to be used in the Accounting Posting and Settlement System (SCL), purporting to insure the accuracy of the amounts measured, as well as the meeting of the required time frames.

Accounting Commensuration

The Domestic Interconnected System (SIN - Sistema Interligado Nacional) is represented at the CCEE through a structure made-up of the commensuration of consumption and generation points, which are defined through the Electric System Modeling, and which purports to obtain the measured net amounts of electric power for each Agent, thus allowing the Posting and Financial Settlement of short term market operations.

In order to obtain said amounts, the Commercialization Rules have established a process for the determination and the treatment of the electric power consumption and generation amounts commercialized by the Agents. The processing of the data is called Accounting Commensuration Aggregation (Agregação Contábil da Medição). There is need for adjustments because losses of electricity occur in the transmission system while the consumption through generation is being accomplished.

At CCEE these losses are apportioned among the Agents which own the consumption and generation commensuration points. Through the apportionment of these losses an assurance is given that the total effective generation of the system will be consonant with the total effective load of the system. The virtual point where the losses of the generation and consumption points become even is called the Gravity Point, and at this point all the purchases and sales of electric power at the CCEE are computed. The existence of this virtual point makes it possible to establish a comparison between the commensurations taken at different actual points of the SIN System.

The points of the SIN system that become part of said apportionment process are those defined by Aneel as being participants in the apportionment of the losses which occurred within the basic network. The losses of electric power are shared equally between the points of generation and consumption, where half the losses are deducted from the total amount generated and the other half is added to the total amount consumed. The generation and consumption totals of each Agent at the Gravity Point are computed as of the commensuration values informed by the Agents to CCEE, so as to be used in the process of posting the energy that has been commercialized on the Short Term Market.

Electric Power Data Collection System - SCDE

The Electric Power Data Collection System - SCDE (Sistema de Coleta de Dados de Energia Elétrica) is responsible for the daily collection and treatment of commensuration data, whereby the acquisition of these data is accomplished automatically, directly from the measuring device or through the Agent's database (UCM).

This system allows the carrying out of logical inspections, providing direct access to the measuring devices, and allowing greater reliability and accuracy to the data obtained. Through the SCDE, market agents achieve greater ease in sending the commensuration data to CCEE, as well as they are able to monitor the information sent on a daily basis.

Technical specifications

When of the need of installation/adaptation of the measurement System for Billing (SMF), the constant technical requirements should be observed in the Annex 1 - technical Specification of the measurements for billing of the sub module 12.2 - Installation of Measurement for Billing of the Module 12 of the Procedures of Net of ONS.

The use was authorized in temporary character by the Resolution Authoritative no. 787, of 23/01/2007 of ANEEL.

For larger details consult the Grid Procedures of ONS - Module 12.

Preventive maintenance - Calibration of the Meters

ONS – Sub module 12.3 - Maintenance of the measurement system for billing

In order to make the System of Measurement for Billing - SMF effective in its operation, it is necessary periodically accomplished preventive maintenances and, when necessary, corrective maintenances in the involved agents' facilities. Inspections in SMF are also accomplished with the intention of verifying the correct operation of the meters.

The activities to be accomplished by the agents involved in the National System - SIN in the maintenances and in the inspections they are described in the Enclosures 1 and 2 of this sub module.

OBJECTIVE

The objective of this sub module is the establishment of the maintenance procedures and of inspection of SMF, as well as the responsibilities, the stages and the periods for its execution.

ANNEX 1

Activities to be accomplished in the maintenance of the System of Measurement for Billing - SMF

(a) The periodicity for the responsible agent's preventive maintenance for SMF is of at the most 2 (two) years. That periodicity can be altered in function of the occurrence report observed in all of the facilities.

(b) The preventive maintenance can be postponed by the period of up to 2 (two) years, in the case of happening inspection in the measurement point. The postponement of that maintenance begins to be in force starting from the date of the inspection.

(c) The minimum tests the transformers should be submitted for instruments (TI) are the following ones: imposed load and diphase with periodicity of, at the most, 8 (eight) years.

(d) In all maintenance or calibration of the meters, these should be substituted by other properly programmed and calibrated, when there is not rear guard meter, in order to minimize the interruption in the registration of the load.

(e) Any changing in the relation of transformation of the TI to assist the protection or any operational condition that affects the measurement circuit for billing should be previously communicated to the responsible agent. That agent should make the changing of the data registered in the System of Collection of Data of Energy - SCDE and to submit it to the approval of the Camera of Commercialization of Electric power - CCEE. After the execution of the alterations in the measurement system, the involved agents should program an inspection to restore the sealing waxes.

(f) The verification of the perfect operation of the several functions of the meter should be accomplished, as programming, mass memory, schedule, registrations, aside reading etc. The conformity of the configuration of mass memory should be verified (Data Record), with the declared by the supplier and constant on the site of CCEE.

(g) The general inspection of the connections of SMF should be accomplished to verify the existence of eventual irregularity to affect the measurement.

(h) The calibration of the meter should be made by comparative method of consumption of Wh, with artificial load, single-phase or three-phase tests, in laboratories or in the field, with patterns tracked to the National Institute of Metrology, Normalization and Industrial Quality - INMETRO.

(i) The applied tension for calibration end should be same to the nominal tension of the meter.

(j) The pattern used in the calibration should be it of the responsible agent for SMF or of contracted laboratory for the responsible agent, but, just for comparison, it can be adopted the agent's pattern that accompanies the maintenance. The standards must be accomplished of their certificates of calibration valid in the period of the event.

(k) The standards, the artificial load and the meter owe, when necessary, to be energized before the tests with tension and nominal current, during the necessary time - at least 30 (thirty) minutes or in agreement with the manufacturers' of the meters orientations and of the pattern - for the thermal stabilization.

(l) The minimum tests that should be submitted each meter are the following ones: calibration with nominal load, activates, reactivates inductive and it reactivates capacitive, and with load activates small, according to the norm ABNT 14520 or IEC 687.

(m) The meter in calibration that present mistakes out of the limits specified by the used norm should be substituted.

(n) The meter identification code supplied by CCEE should be programmed and/or verified.

(o) The phasorial studies of the currents, of the tensions and of the sequence of phases they should be accomplished before and after the maintenance.

(p) In the connected agent's case or the responsible agent for SMF be late in the arrival to the place, the involved agents should wait 2 (two) hours, when, then, they should cancel the service, except for agreement among the parts regarding the awaiting period.