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

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SECTION A. General description of project activity

A.1 Title of the project activity:

>>
Monjolinho Energética S.A.'s CDM Project.

PDD Version number: 5.

Date: October 28th, 2008.

A.2. Description of the project activity:

The project activity consists on the supply of clean hydroelectric energy to the Brazilian National Interconnected System (SIN) through the implantation and operation of Hydro Power Plant (HPP) Monjolinho (Alzir dos Santos Antunes), located in the state of Rio Grande do Sul, Southern Region of Brazil, using a small reservoir, with low environmental impact.

The main objective of the Hydro Power Plant Monjolinho (Alzir dos Santos Antunes) is to help attend the growing demand for energy in Brazil, due to the country's economical and population growth, supplying clean and renewable energy, contributing, thus, to the environmental, social and economical sustainability, by increasing the participation of clean and renewable energy in relation to the country's total consumption of electricity.

The project activity reduces the emissions of green house gases (GHG), avoiding the generation of electricity through sources of fossil fuels with consequent CO_2 emissions, which would be produced if the project did not exist. The supply of clean and renewable electricity will bring and important contribution to environmental sustainability, reducing the emissions of carbon dioxide taking place in the absence of this project.

Monjolinho Energética S.A. – MONEL – is a special purpose company, constituted to build and operate the Monjolinho hydroelectric plant as its exclusive owner. According to the first additive term in the contract celebrated along with ANEEL (National Agency of Electrical Energy), the implantation schedule of the HPP Monjolinho (Alzir dos Santos Antunes) is described below:

Table 1 – HPP Monjolinho (Alzir dos Santos Antunes)'s Physical Schedule Approved by ANEEL

Activity	Deadline (dd/mm/yyyy)
Beginning of the powerhouse's concretion	01/06/2008
Descent of the 1st turbine's rotor	01/04/2009
Beginning of the 1st hydrogenerator unit's commissioning	01/09/2009
1st hydrogenerator unit's commercial operation start	01/11/2009
Descent of the 2nd turbine's rotor	01/06/2009
Beginning of the 2nd hydrogenerator unit's commissioning	01/11/2009
2nd hydrogenerator unit's commercial operation start	31/12/2009

Although the first hydro generator unit commercial operation start is expected to happen on November 1st, 2009, Monjolinho Energética S.A. works with the goal of anticipating the commercial generation to July/2009 and, for that, it has been developing an acceleration program for the construction plan.

Monjolinho Energética S.A – MONEL has as unique shareholder the company Desenvix S.A. Desenvix S.A. is a subsidiary of Engevix Engenharia S.A., created in 1995 to develop new businesses, especially in the area of electric energy generation in three states of Brazil - Rio Grande do Sul, Santa Catarina and

Rio de Janeiro – through its controlled companies. Desenvix S.A has participation, besides Monjolinho Energética S.A, in others energy generation entrepreneurships, which totalize 154.85 MW of installed capacity: Dona Francisca Energética (2.65 MW); CERAN (18 MW); Esmeralda S.A (22.20 MW); Santa Laura S.A. (15 MW) and Santa Rosa (installed capacity of 30 MW).

Desenvix S.A. is controlled by Engevix Engenharia S.A, which holds 100% of the social capital and its directors are the same shareholders of the controller company. The history of Desenvix S.A., despite recent, reflects more than four decades of development and growth of its controller company.

Engevix is a Brazilian company, specialized in the services of advisory engineering, responsible for the elaboration of project, integration and management of entrepreneurships in the area of energy, industry and infrastructure. It has more than 42 years of history and has a strong action in and outside Brazil in the sector of hydraulic, thermal and nuclear and through alternative sources of energy generation; transmission and distribution of energy, construction on urban transportation and sanitation, among others sectors. Engevix operates with 1,4 thousand collaborators and has offices in Brazil in the cities of Florianopolis, São Paulo, Rio de Janeiro, Brasília and Curitiba, as well as abroad, in countries such as Angola and Mexico.

Proof of its capacity of realization are the participation in huge projects as the hydroelectric plants of Itaipu, Tucuruí, Capivara, Volta Grande, Salto Caxias, Canoas I and II; Nuclear Plant Angra II; Metropolitan trains in São Paulo, Rio de Janeiro, Belo Horizonte and Porto Alegre, Subways in São Paulo, Baghdad and Rio de Janeiro; Expansion projects of the steel companies COSIPA, Usiminas, Açominas and CST; Railway in Carajás; Alunorte factory in Barcarena; Airports in São Paulo and Rio de Janeiro (second phase); Bandeirantes, Ayrton Senna and Carvalho Pinto Highways.

A great part of the company's growth history is related to its performance in the energy sector and, this way, Desenvix S.A was created to make the participation of Engevix in energetic generation projects possible. Acting as a holding, the company develops its activities through its controlled companies that exercise the function of independent producers of energy in the national electrical sector.

One of these controlled companies is Monjolinho Energética S.A. – MONEL, created specifically to implement and to operate Monjolinho Energética S.A.'s CDM Project (hereafter referred to as "Monjolinho Project"), which contributes to the sustainable development once contributing to the economic growth without compromising the future generations, respecting the concept of Sustainable Development, established by Brundtland Report, elaborated by the World Commission on Environment and Development, which defines the term "sustainable development" as "the development that satisfies the present necessities, without compromising the capacity of future generations of supplying their own necessities"[1]

Through the following actions, Monjolinho Project contributes to the sustainable development of its region and country:

(a) Through Monjolinho Project, clean and renewable energy will be dispatched to the Brazilian National Interconnected System, displacing possible entrepreneurships that would generate energy through the burning of fossil fuels, avoiding, thus, the emission of poluent gases to the atmosphere and preserving the environment to future generations.

(b) Through the generation of approximately 900 direct jobs, indirect jobs and through the boosting of economics activities aggregated to the entrepreneurship's implementation, Monjolinho Project promotes the region's economic development, which happens through the generation of income to the community

[1] WCED [CMMAD], 1987. Our Commom Future [Nosso Futuro Comum]. The World Commission on Environment and Development [Comissão Mundial sobre Meio Ambiente e Desenvolvimento]. Oxford University Press.

of the municipalities involved and to its collaborators. Furthermore, through the taxes and tributes generated by its activities to the cities involved and to the Union, Monjolinho Project provides financial resources which will be reverted into benefits to the region's population and for the country as a whole.

(c) Besides Monjolinho project presents low environmental impacts, with the formation of a small reservoir and elevated power density, Monjolinho Energética S.A. makes considerable investments in environmental programs and actions. It will be developed 24 environmental programs on the physical, biotic and anthropic environment to mitigate possible project's environmental impacts. We can highlight the reforestation program, which predicts the planting of 250,000 small branches of native species along the ciliar zone and the specific programs of environmental education that will contribute to the awareness of the population in the municipalities involved in the entrepreneurships about environmental and ecological issues.

(d) Since the HPP Monjolinho (Alzir dos Santos Antunes) is located in the rural area of Rio Grande do Sul, the implantation of this kind of project in the region will demand the capacitating of the collaborators to be hired or sub-hired in the region and of the population itself in the municipalities involved. Through a environmental education program, activities along with the scholar community of the municipalities within the project's direct influence will be realized, besides activities to capacitate sub-hired companies, and educational activities with residents of the reservoir's surroundings. Moreover, Engevix S.A. has a human resources politics that aims at the qualification of all the collaborators of the companies in the group, applying also to the collaborators of the HPP Monjolinho (Alzir dos Santos Antunes). Through this action, Monjolinho Energética S.A seeks to capacitate its collaborators to the market and contribute to the growth of knowledge and to the level of education of the municipalities where it acts.

(e) Investments in culture and on social responsibility programs are part of the company's culture and will be also carried out in Monjolinho project. Through Engevix Institute, the group promotes social investments mainly in the area of children education, through social-educative and professionalizing workshops. Furthermore, for over 25 years, Engevix S.A. develops programs to support culture, particularly in arts and music. Continuing the Engevix culture, investments on social-cultural project will also be developed in Monjolinho project, which has a BNDES', National Bank of Economic and Social Development, specific funding line, in amount of R$ 2 million, to invest in social programs that will be developed in the Entrepreneurship's implementation.

Through its performance in several sectors in society and through the investments in the energetic sector, Monjolinho Energetica S.A. seeks to continue contributing to the sustainable development of the cities where it acts, in the region and in the country as a whole.

A.3. Project participants:

Monjolinho Energética S.A. is the owner of Hydropower Plant Monjolinho (Alzir dos Santos Antunes) and it is responsible for all activities related to the plant`s implementation and operation.

Enerbio Consultoria Ltda advises Monjolinho Energética S.A. to develop CDM Project and to monitor the CERs to be generated from the Monjolinho Project.

Monjolinho Energética S.A. is the Project Focal Point. The table 2 below represents the parties and entities involved in the Monjolinho Project.

Table 2 – Private and public parties and entities involved in the activity

Name of Party involved (*) ((host) indicates a host Party)	Private and/or public entity(ies) project participants (*) (as applicable)	Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No)
Brazil (host)	Private Entity: Monjolinho Energética S.A.	No
	Private Entity: Enerbio Consultoria Ltda	
(*) In accordance with the CDM modalities and procedures, at the time of making the CDM-PDD public at the stage of validation, a Party involved may or may not have provided its approval. At the time of requesting registration, the approval by the Party(ies) involved is required.		

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

A.4. Technical description of the project activity:

A.4.1. Location of the project activity:

A.4.1.1. Host Party(ies):

>>
Brazil.

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

Region: South of Brazil

State: Rio Grande do Sul.

A.4.1.3. City/Town/Community etc:

Municipalities of Faxinalzinho, Nonoai, Benjamin Constant do Sul and Entre Rios do Sul.

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

The powerhouse of HPP Monjolinho (Alzir dos Santos Antunes) is located on Passo Fundo River, sub-basin 71, Uruguai River Basin, in the municipalities of Faxinalzinho and Nonoai, State of Rio Grande do Sul, South Region of Brazil, on coordinates 27°20'44" South Latitude and 52°43'52 West Longitude.

Although it is located between the municipalities of Faxinalzinho and Nonoai, the project also presents impacts in the cities of Benjamin Constant do Sul and Entre Rios do Sul, because part of the HPP Monjolinho (Alzir dos Santos Antunes)' reservoir flooded area is located in these municipalities.

The table below shows some socio-economical indicators of the municipalities where the HPP Monjolinho (Alzir dos Santos Antunes) is located:

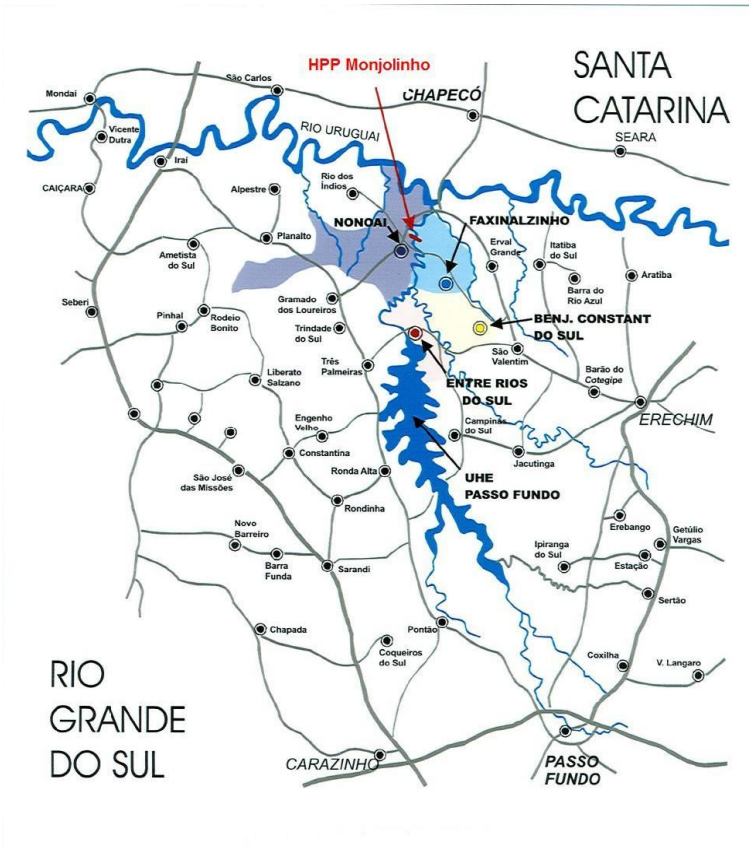
Table 3 – Socio-Economical indicators of municipalities where the HPP Monjolinho (Alzir dos Santos Antunes) is located

Municipality	Total Population (2006)	Area (km2)	Anual GDP per capita (2004)	Iliteracy Rate (2000)	Life expectancy (2000)
Faxinalzinho	2,795	143.4	R$ 5,446	12.63%	67.75 years
Nonoai	11,844	469.3	R$ 6,910	16.75%	67.45 years
Entre Rios do Sul	2,891	120.4	R$ 15,560	11.38%	67.75 years
Benjamin Constant do Sul	2,498	132.4	R$ 4,549	19.62%	64.09 years

*Data Source: Fundação de Economia e Estatística, organization linked to Secretaria do Planejamento e Gestão of Rio Grande do Sul State`s Government.
Available at: www.fee.rs.gov.br/sitefee/pt/content/resumo/pg_municipios.php

The map below shows the localization of HPP Monjolinho (Alzir dos Santos Antunes):

Map 1 – Localization of HPP Monjolinho (Alzir dos Santos Antunes)



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

Sectoral Scope 1 – Energy Industries (Renewable Source)

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

The HPP Monjolinho (Alzir dos Santos Antunes) will use the Passo Fundo River's hydraulic potential to generate electricity with an installed capacity of 74 MW. The HPP Monjolinho (Alzir dos Santos Antunes) is a run-of-river hydroelectric power plant with a small reservoir with 5.46 km^2.

The Basic Project of HPP Monjolinho was approved in 22th May 2007. Initially, the installed capacity of HPP Monjolinho (Alzir dos Santos Antunes) was 67 MW. In 04/06/2008 (DD/MM/YYYY), ANEEL (National Agency of Electric Energy) approved an increase in the installed capacity of HPP Monjolinho (Alzir dos Santos Antunes). The new official installed capacity is 74 MW. It is important to say that the reservoir area to be flooded did not change to the area initial projected.

MONEL also required a review in the assured energy of 43.1 MW. However, until the validation process of this PDD, project participants have not been answered yet.

The table below presents the main technical parameters of HPP Monjolinho (Alzir dos Santos Antunes).

Table 4: Technical Characteristics of HPP Monjolinho (Alzir dos Santos Antunes)

1. DAM					
TYPE: Rockfill with Concrete Face			ROCKFILL:	1,284,589	m^3
LENGTH ALONG CREST:	420	m	FILTER AND TRANSITION	55,850	m^3
MAXIMUM HEIGHT:	74	m	CONCRETE (**CONVENTIONAL**):	11,632	m^3
ELEVATION OF CRESTA:	335	m	TOTAL VOLUME:	1,378,253	m^3
2. SPILLWAY					
TYPE: SURFACE WITH OVERFLOW CREST					
CAPACITY:	6,755	m^3/s			
LEVEL SURFACE:	328,50	m			
TOTAL LENGHT:	210	m			
NUMBER OF GATE:	1				
GATE'S WIDTH:	210	m			
COMMOM EXCAVATION:	96,755	m^3			
ROCK EXCAVATION ON OPEN SKY:	880,078	m^3			
CONCRETE (CONVENTIONAL):	6,955	m^3			
3. ADDUCTOR SYSTEM					
APPROACH CHANNEL			**WATER INTAKE**		
LENGHT:	155	m	TYPE:	GRAVITY	
COMMOM EXCAVATION	18,300	m^3	TOTAL LENGHT:	25	m
ROCK EXCAVATION ON OPEN SKY:	80,800	m^3	NUMBER OF GATE:	2	
			COMMOM EXCAVATION:	7,700	m^3
			ROCK EXCAVATION ON OPEN SKY:	27,200	m^3

			CONCRETE:	4,622	m^3
TUNNEL					
INTERNAL DIAMETER:	4.20/3.60	m	**FLOODGATES**		
			TYPE	WAGON	
MEDIUM LENGHT:	111	m	TO SET IN MOTION	HIDRAULIC	
CONCRETE:	2,596	m^3	GATE'S WIDTH	4.20	m
UNDERGROUND ROCK EXCAVATION::	6,890	m^3	GATE'S HEIGHT:	4.00	m
4. POWER HOUSE					
TYPE: SHELTERED			COMMOM EXCAVATION:	54,830	m^3
NUMBER OF GENERATORS UNITS:	2		ROCK EXCAVATION ON OPEN SKY:	107,840	m^3
WIDTH OF BLOCK OF UNIT	14	m	CONCRETE:	8,260	m^3
WIDTH OF MOUNTING AREA:	25	m			
WIDTH OF UNLOADING AREA:	8.15	m			
TOTAL LENGHT:	68.00	m			
5. TURBINES					
TYPE: FRANCIS			NOMINAL UNIT FLOW:	139	m^3/s
NOMINAL UNIT POWER:	37.75	MW	MAXIMUM PERFOMANCE:	95	%
SYNCHRONOUS ROTATION	257.14	rpm			
PROJECT GROSS FALL:	63.3	M			
6. GENERATORS					
NOMINAL UNIT POWER:	41.1	MVA	MAXIMUM PERFOMANCE:	98	%
SYNCHRONOUS ROTATION:	257.14	Rpm	CAPACITY FACTOR:	0.90	
NOMINAL TENSION:	13.8	kV			
7. ENERGETIC STUDIES					
MAXIMUM GROSS FALL:	65.3	m	ASSURED ENERGY	43.1	MW MEDIUM
NET FALL REFERENCE	61.0	m			
POWER PLANT CAPACITY:	74	MW			

The equipments and technologies to be employed in the project were developed in Brazil and have already been successfully applied to similar projects in the country and in the world. The technology applied is well established in the sector, since Francis turbine is one of the most widely used in hydropower plants projects in the world. A national company will be responsible for the entrepreneurship's implantation, since a Engevix S.A.was hired by Monjolinho Energética S.A. to the entrepreneurship's complete execution through the EPC (Engineering, Procurement and Construction) modality, being responsible for the whole project elaboration, from feasibility study to construction, Electromechanical assembly, works on reservoirs and emergency action plans.

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

Using the monthly baseline emission factor calculated as presented on the item B.6.1, the complete implementation of the Monjolinho Project, connected to the South Brazilian interconnected grid, will generate a yearly average estimated reduction of **98,262 tCO_{2e}** and a total reduction of **687,834 tCO_{2e}** during the first 7-year-period, described in the table below:

Table 5: Estimation of Monjolinho Project's emissions reduction

Year	Annual estimation of emission reductions (tCO_2e)e
***2009**	12,460
****2010**	98,835
2011	98,835
2012	98,835
2013	98,835
2014	98,835
2015	98,835
*****2016**	82,363
Total Estimated Reductions (tCO_2e)	**687,834**
Total Number of Crediting Years	**7**
Annual average over the crediting period of estimated reductions (tonnes of CO2e)	**98,262**

- *Prevision for the first turbine generator (with an assured energy of 32.6 MW)'s beginning operation on 01/11/2009. The year of 2009 accounts just for first generator turbine's generation from November to December (01/11/2009 to 31/12/2009);
- ** Prevision for the second turbine generator beginning operation on 31/12/2009. The year of 2010 accounts the generation of two generators turbines during all year, with an assured energy of 43.1 MW;
- *** The year of 2016 accounts 10 months of generation (01/01/2016 to 30/10/2016)

A.4.5. Public funding of the project activity:

No public funding for the CDM's project activities was solicited by parties involved in Annex I.

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:

- Consolidated baseline and monitoring methodology ACM0002, version 7 - Methodology Consolidated for grid-connected electricity generation from renewable sources.

- Tool for Demonstration and Assessment of Additionality, Version 5.

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 ACM0002 consolidated methodology is applicable to grid-connected renewable power generation that involves electricity capacity additions:

- The project activity is the installation or modification/retrofit of a power plant/unit of one of the following types: hydro power plant/unit (either with a run-of-river reservoir or an accumulation reservoir), wind power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit.

- In case of hydro power plants:

    - The project activity is implemented in an existing reservoir, with no change in the volume of reservoir;
    - The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the Project Emission section, is greater than 4 W/m^2.
    - The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the Project Emissions section, is greater than 4 W/m^2.

- 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 methodology can be applicable to Monjolinho Project due to the following aspects:

- HPP Monjolinho (Alzir dos Santos Antunes) is an installation of a new hydro power plant/unit;

- The geographic and system boundaries for the relevant electricity grid can be clearly identified and information on characteristics of the grid is available due to the geographic data and the relevant electricity grid system limits are easily identified, as well as all information about the grid is available in ONS, Operador Nacional do Sistema (National System Operator), (www.ons.org.br), and in ANEEL, Agência Nacional de Energia Elétrica (National Agency of Electric Energy), (www.aneel.gov.br).

- HPP Monjolinho (Alzir dos Santos Antunes) is a project activity which result in new reservoirs and the power density of the power plant is greater than 4 W/m^2 (and it is also greater than 10 W/m^2), as described in the table 6;

The project activity`s power density, according ACM0002 methodology, is calculated as demonstrated below:

$$PD = \frac{Cap_{PJ} - Cap_{BL}}{A_{PJ} - A_{BL}} \qquad \textbf{Equation 1}$$

Where:

PD = Power Density of the project activity, in W/m^2
Cap_{PJ} = Installed capacity of the hydro power plant after the implementation of the project activity (W);
Cap_{BL} = Installed capacity of the hydro power plant before of the project activity (W). For new hydro power plants, this value is zero;
A_{PJ} = Area of the reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir is full (m^2);
A_{BL} = Area of the reservoir measured in the surface of the water, before the implementation of the project activity, when the reservoir is full (m^2). For new reservoirs, this value is zero.

The table 6 below evidences that HPP Monjolinho (Alzir dos Santos Antunes) has a power density greater than 4 W/m^2 and also greater than 10 W/m^2.

Table 6: Power Density of HPP Monjolinho (Alzir dos Santos Antunes)

Item	HPP Monjolinho
Cap_{PJ}	74.000.000
Cap_{BL}	0
A_{PJ}	5.460.000
A_{BL}	0
PD	**13.55**

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

The National Interconnected System (from Portuguese Sistema Interligado Nacional - SIN) is managed by ONS, which is responsible for all activities related to the operation's planning. The ONS traditionally subdivides the National Interconnected System into two subsystems interconnected: the South/ Southeast/Midwest Subsystem and the North/Northeast Subsystem. These Subsystems are related to the Brazilian geographic regions: South, Southeast, Midwest, North and the Northeast Region.

Due to the offer's real availability and the consumption behavior in each region, ONS establishes inter-regional energy exchange politics, besides exceptional attitudes to thermal generation dispatch, in case the storage levels of water significantly reduce and tend to violate the security curves. These conditions are permanently monitored and available to the electric industry agents.

According to ACM0002, version 07, the special extension of the project's boundaries includes the project power plant and all power plants physically connected to the electricity system that the CDM project power plant is connected to. The HPP Monjolinho is connected to National Interconnected System, more specifically to the South/Southeast/Midwest Subsystem.

The greenhouse gases and emission sources included in or excluded from the project boundary are shown in the table below:

Table 7: Emissions sources included in or excluded from the project boundary

	Source	Gas	Included?	Justification / Explanation
Baseline	CO_2 emissions from electricity generation in fossil fuel fired power plants that is displaced due to the project activity	CO_2	Included	Main Emission Source. In the absence of the Project, the presence of coal thermoelectric plants in the National Interconnected System, more precisely in the South/Southeast/Midwest Subsystem, where the Monjolinho Project is located, would cause emission of GHGs.
		CH_4	Excluded	Minor Emission Source
		N_20	Excluded	Minor Emission Source

	Source	Gas	Included?	Justification / Explanation
Project Activity	Hydropower Electricity Generation	CO_2	Excluded	As described on the item B.2, the HPP Monjolinho's power density is greater than $10W/m^2$, so the GHGs` emissions from the project activities are zero (PE_y=0).
		CH_4	Excluded	
		N_20	Excluded	

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

In the absence of the project activity, the clean energy generated by Monjolinho Project dispatched to the National Interconnected System (SIN), through the delivery in the South/Southeast/Midwest Subsystem, would have been generated through non-renewable sources from Power Plants connected to the interconnected grid, fostering the emission of greater quantities of green house gases.

According to the methodology ACM0002, if the project activity is the installation of a new renewable grid-connected power generation plant, the baseline scenario is the following:

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

The combined margin emission factor of South/Southeast/Midwest Subsystem will be calculated, according to the "Tool to calculate the emission factor for an electricity system" approved by the CDM Executive Board and published in the Annex 12 of EB 35 Report.

The CO_2 emission factors for power generation in the South/Southeast/Midwest Subsystem, necessary to Combined Margin (CM) calculation, are calculated based on the generation record of plants centrally dispatched by the **National Operator of the System** (From the Portuguese: Operador Nacional do Sistema - ONS).

It will be, therefore, used the combined margin emission factor for the South/Southeast/Midwest Subsystem to calculate the emission reduction of the project.

This baseline is perfectly applicable to HPP Monjolinho (Alzir dos Santos Antunes).

As an additional information, it can be noticed, through the projection established by the Ministry of Mines and Energy (MME) in the Decennial Plan of Electrical Energy Expansion[2] to the period of 2006-2015, that other activities and technologies that propitiate a higher emission of green house gases would occur in the absence of these project.

Brazilian Decennial Plan for Electric Energy Expansion (2006-2015)

In 2006, the Ministry of Mines and Energy elaborated the Decennial Plan for Electric Energy Expansion to the period of 2006-2015, establishing three possible scenarios, based on the growth projection of the country's Gross Domestic Product (GDP). We adopted to this analysis the scenario pointed out by the MME as the most likely to happen, called reference scenario. This reference scenario estimates the necessity of expansion of the Brazilian electrical sector.

Considering MME's projection, it was traced a plan for the generation expansion based on the energetic offer from the implantation of entrepreneurships of hydroelectric and thermoelectric generation. It was estimated a necessity of growth in the energetic offer which points to an additional energy's offer from thermoelectric entrepreneurships that will result on a volume of 10,486 MW in 2006-2015 period.

It is important to highlight that from the additional offer of 10,486 MW coming from thermoelectric Plants, the projection indicates that 1,769 MW will be generated from the entrepreneurships that will dispatch energy to SIN in the South Region of Brazil. The thermoelectric plants projected to start their operation through the South Region in the period of 2006-2015 are described below:

Table 8: Thermoelectric Power Plants to be developed in the Brazilian South Region predicted in the Decennial Plan for the Expansion of the Electrical Sector.

Power Plant	Capacity (MW)	Fuel	Start of Operation
Canoas	250	Natural Gas	January/08
Araucária	469	Natural Gás	December/08
Jacuí	350	Mineral Coal	December/08
Candiota III	350	Mineral Coal	December/08
Carvão Indic. S	350	Mineral Coal	December/09
Total	**1,769**		

It is also important to highlight that there are currently 7 thermoelectric plants in Brazil, operating with mineral coal, totalizing an installed capacity of 1,415 MW, according to the table[3] below:

[2] Source: Ministério de Minas e Energia (MME) - Plano Decenal de Expansão de Energia Elétrica, 2006-2015

[3] Source: Aneel - http://www.aneel.gov.br/area.cfm?idArea=15&idPerfil=2

Table 9: Thermoelectric Power Plants in Operation in Brazil

Power Plant	Capacity (MW)	State
Figueira	20	Paraná
Charqueadas	72	Rio Grande do Sul
Pres. Médici A, B	446	Rio Grande do Sul
São Jerônimo	20	Rio Grande do Sul
Jorge Lacerda I e II	232	Santa Catarina
Jorge Lacerda III	262	Santa Catarina
Jorge Lacerda IV	363	Santa Catarina
Total	**1,415**	

All the thermo electrical entrepreneurships that generate energy from mineral coal burning in the country are situated in the South Region, where Monjolinho Project is located.

The Energetic Expansion Plan to the period of 2006-2015 predicts a growth of approximately 74% in the offer of electrical energy based on mineral coal in the country, all the projects being located in the South region, connected to the National Interconnected System through the South/Southeast/Midwest Subsystem.

It is reasonable to consider that the electric energy generation of Monjolinho Project can avoid the thermo electrical entrepreneurships that generate energy from the burning of mineral coal, whether they are new or existent, from being activated.

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):

This item is elaborated based on "Tool for the demonstration an assessment of additionality", version 5, available on the website http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html .

This tool describes some steps to be followed to demonstrate and assess the additionality of the project.

The following requirements are necessary to demonstrate and assess the additionality of the Monjolinho Project:

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:

- The continuity of the present scenario, with electricity generation happening according to the current generation composition of the National Interconnected System, more specifically of the South/Southeast/Midwest Subsystem;

- The construction of a new mineral coal thermoelectric power plant, with similar installed capacity to the HPP Monjolinho (Alzir dos Santos Antunes);

- The project activity undertaken without being registered as a CDM Project Activity.

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

Both the project activity and the alternative scenarios are in accordance to the applicable laws and regulamentations. As exposed in item B.4 of this PDD, it is in the South Region where the only thermoelectric mineral coal plants of the country are located. Particularly, approximately 38% of thermo electrical coal plants of the country are located in Rio Grande do Sul. Moreover, according to the Brazil's Atlas of Electric Energy[4], 90% of the national reservations of mineral coal are concentrated in Rio Grande do Sul, where Monjolinho Project is located.

It is also remarkable that according to what was exposed in item B.4, the Ministry of Mines and Energy projects a growth in the offer of energy generation from mineral coal thermoelectric centrals and that this projection indicates that, until 2015, the capacity to generate energy of the entrepreneurships that dispatch energy from mineral coal in the South Region will grow approximately 74%.

It is important to clarify that the Brazilian Institutional New Model of the Electric Sector allows the private and public agents to decide the amount of energy to be hired and the investments to be realized from the participation in auctions of power plants and systems of transmission.

According to MME [5], "it is the agents of distribution that decide and compromise themselves to pay, through contracts resulting from auctions, amounts of electrical energy coming from new installations of electric energy generation to be delivered (…). With the distributors' information, the generators may then decide which new entrepreneurships of generation they wish to build, presenting in the auctions proposals of selling prices of their electric energy, competing for contracts of energy purchase from distributors. Additionally, the generators may also hire direct and freely with free consumers".

This way, it can be noticed that there are no restrictions in the applicable laws and regulamentations to the implantation of the alternative scenarios to CDM's activity project. Furthermore, we can also verify that through the MME's projection mentioned before there is even a tendency with great probabilities of occurrence of the alternative scenarios in the absence of projects similar to Monjolinho Project.

It is further noticeable that the Brazilian Institutional New Model of the Electric Sector provides autonomy to the economic agents about the investments to be realized in the Brazilian electric sector, not existing, therefore, restrictions nor impositions to the project activity and to its alternatives.

Thus, both the activity project and the alternative scenarios fulfil all the Brazilian norms and regulamentations, being also plausible according to the tendencies in the country's electrical sector.

Step 2. Investment analysis

Determine whether the proposed project activity is not:

(a) The most economically attractive; or
(b) Economically or financially feasible, without the revenue from the sale of certified emission reductions (CERs);

To conduct the investment analysis, it must be used the following steps:

[4] Atlas de Energia Elétrica do Brasil [Atlas of Brazilian Electric Energy], ANEEL, 2002

[5] Ministério de Minas e Energia (MME) [Ministry of Mines and Energy] – Plano Decenal de Expansão de Energia Elétrica 2006-2015 [Decennial Plan for Energy Expansion 2006-2015].

Sub-step 2a. Determine appropriate analysis method

The project generates financial and economics benefits, other than CDM related income, then, it will be used the benchmark analysis to analyse the project activity of Monjolinho Project.

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

It will be used the project internal rate of return (IRR) as a project financial indicator, due to it is the most commonly and appropriate indicator used to infrastructure projects` investment analysis. As a benchmark, it will be used Weighted Average Capital Cost – WACC - of the project.

WACC (Weighted Average Capital Cost)

The Weighted Average Capital Cost is calculated through the composition of costs and the participation percentage of each source of capital in the company's capital structure. The Monjolinho Energética S.A's Weighted Average Capital Cost was calculated according the equation below:

$$WACC = \frac{E}{V} * Re + \frac{D}{V} * Rd * (1 - Tc)$$ **Equation 2**

Where:

E/V = Percentage of Equity in Company's Capital Structure;
Re = Cost of Equity;
D/V = Percentage of Debt in Company's Capital Structure;
Rd = Cost of Debt
Tc = Income Tax in Brazil

To calculation of cost of equity was used the CAPM Model (Capital Assets Price Model), which indicates the following equation:

$Re = R_f + \beta_i (ERP)$ **Equation 3**

Where:

Re = Cost of Equity;
R_f = Rate of Return of a Risk Free Asset;
β_i = Beta Coefficient;
ERP = Equity Risk Premium;

To calculation of cost of debt was used the entrepreneurship's cost of lending.

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

Monjolinho Energética S.A. considers the project's cash flow a confidential information and, thus, it will be presented entirely to the Designated Operational Entity which will perform the validation and to any entity linked to the CDM that ask it for the purpose of proving the project's additionality. However, it will not be available in the PDD. The cash flow was elaborated according the following assumptions:

Table 10: Assumptions used at Monjolinho Project's cash flow

Concession Term	40 years
Energetic Characteristics	
Generator Unit 1	
Beggining Operation:	1/11/2009
Capacity	33.5 MW
Assured Energy:	32.6 MW
Generator Unit 2	
Beggining Operation:	1/12/2009
Capacity	33.5 MW
Assured Energy:	10.5 MW
Power Purchase Agreement	
Selling Contracts Post-2011	
Selling Price:	R$ 124.52 / MWh
Term:	Jan/2011 to Dec/2040
Selling Contracts Before-2011 (Free Market of Energy)	
Selling Price:	R$ 140 / MWh
Term:	Sep/2009 to Dec/2010
Operational Expenses and Sectorial Taxes	
O&M:	R$ 125 thousand/month + R$ 150 thousand/year (estimated
Use of the Public Asset (UBP in Portuguese):	R$ 3,901,843 per year
Financial Compensation	R$ 57.63/MWh on 6.75% of Assured Energy
Supervisory Tax ANEEL:	R$ 289.22 kW per year over 0.5% of Installed Capacity
Estimated TUST :	R$ 2.222/kW per month
TUSD RGE:	R$ 2.99/kW per month
CCEE Tax:	R$ 24 thousand per year
ONS Tax:	R$ 24 thousand per year
Research and Development:	1% over Net Operational Revenue
Assets`s insurance:	0,4% per year over the invested value
Lending:	
Cost of Debt	TJLP + 2,10%
Grace Period	6 months
Amortization:	16 years
Amortization System	SAC
Capital Structure	
Equity:	R$ 66.223.000
Debt:	R$ 169.659.000
Total Capital	R$ 235.882.000
Depreciation	
ANEEL	35%
Federal Revenue	20%

It is important to highlight that all values and input used in the investment analysis spreadsheet were values at the time of the investment decision taken, as indicated by item 6 of the "Annex: Guidance on the Assessment of Investment Analysis" which is an Annex of the "Tool for the demonstration and assessment of additionality". The installed capacity of the plant used in the spreadsheet was 67 MW and therefore the investment amount and all others parameters are related to that moment.

The change of the HPP Monjolinho (Alzir dos Santos Antunes) installed capacity approved by ANEEL in June 2008 will cause the necessity of more investment and it can probably bring more revenues. It is important to highlight that Power Purchase Agreement are established according assured energy and until now, the official assured energy approved by ANEEL is 43.1 MW. Therefore, it is not certain that this change will bring more revenues.

The project internal rate of return resulting from the cash flow elaborated according to assumptions above is 9.27% per year.

To calculate the weighted average capital cost was used the following assumptions:

Cost of Equity:

To calculate the cost of equity, using the equation 3, the parameters adopted were the following:

- Re = Cost of Equity;
- R*f* = Rate of Return of U.S. Treasuries (T-Bond) of 30 years[6] + Median of Brazilian Risk between 2001 and 2006[7] + Average of Adjustment between U.S[8] Inflation and Brazilian Inflation[9] of the years 2004,2005 and 2006
- β*i* = Project Beta. To calculate the Project Beta, it was used the following steps: 1º Step – It was obtained the Levered Beta between the Electric Energy Index (IEE)[10] and the Bovespa Index (Índice Ibovespa) [11] for the period of august/2002 to July/2007; 2º Step – The Beta was Unlevered according the average capital structure of the companies that compose the IEE; 3º Step – The Unlevered Beta was levered again according to the capital structure of the project. This Levered Beta was used for calculation of Monjolinho Project cost of equity.
- ERP = Equity Risk Premium in Brazil, calculated by Aswath Damodaran[12] according to data of Standard & Poors.

The table below presents the values used to cost of equity's calculation.

Table 11: Values Used on Cost of Equity's Calculation

Parameters	HPP Monjolinho
Rf - Rate of Return of a Risk Free Asset	**10.93%**
Rate of Return of U.S. Treasuries	4.38%
Median of Brazilian Risk	4.23%
Adjustment of Inflation	2.33%
Project Beta	**1.67**
Levered Beta (IEE - IBOVESPA)	0.93
Unlevered Beta	0.62
Equity Risk Premium	**7.79%**
CAPM	**23.94%**

Therefore, the cost of equity is 23.94% per year.

[6] Source: http://www.bloomberg.com/markets/rates/index.html

[7] Calculated Through the Average of the Index Índice EMBI + Brasil, available at: http://www.cbonds.info/index/search.php

[8] To measure the American Inflation the Index CPI – U. Available at: ftp://ftp.bls.gov/pub/special.requests/cpi/cpiai.txt

[9] To measure the Brazilian Inflation the Index IPCA was used. Available at: http://pt.wikipedia.org/wiki/Infla%C3%A7%C3%A3o#Hist.C3.B3rico_do_Quadro_Inflacion.C3.A1rio_no_Brasil

[10] The Electric Energy Index is composed by the stocks of the most representatives companies in the electric industry in the São Paulo Stock Exchange. Source of Data: São Paulo Stock Exchange. Available at: http://www.bovespa.com.br/Mercado/RendaVariavel/Indices/FormConsultaAnuaisFechDia.asp?Indice=IEE

[11] Index calculated by São Paulo Stock Exchange which reflects the average perfomance of the prices in Brazilian Stock Market. The stocks members of the theoretical portfolio answer for more than 80% of the number of business and of the financial volume negotiated in the spot market of São Paulo Stock Exchange.. Source: Bloomberg

[12] Available at http://pages.stern.nyu.edu/~adamodar/

Cost of Debt

The cost of debt is base on the cost of lending's contract. The Monjolinho project's funding was signed with BNDES according to conditions described on table 10. For financial and economic modeling effects, TJLP was considered uniform during all lending period, with a value of 6.25% per year. The cost of debt is formed, thus, by TJLP plus 2.1% per year as banking spread, constituting a total cost of 8.35% per year.

Weighted Average Capital Cost

The project's capital structure is composed by 28.07% of equity and 71.93% of debt, as described on table 10. This way, considering a cost of equity of 23.94%, a cost of debt of 8.35%, an Income Tax + Social Contribution of 34% and applying the equation 2, there is a WACC of 10.68%

The table below shows a comparison's summary between the project's financial indicators and the benchmarks:

Table 12: Project Internal Rate of Return x WACC

Project IRR	WACC
9.27%	10.68%

The benchmark analysis was used (Option III) and it showed that project's indicator are less favourable than benchmark, then, it can be said that the CDM Project Activity cannot be considered as financially attractive.

Sub-step 2d. Sensitivity analysis

The three variables that might affect the project's finance are (i) the electricity price, (ii) the total amount of investment and (iii) the O&M Cost. The sensitivity analysis considers just the scenarios which contribute to increase the project's financial and economic attractiveness with the objective to confirm how solid the sub-step 2b and 2c's analysis is. The table below presents the results for the main parameters variation which can affect project's cash flow.

Table 13: Monjolinho Project's Sensitivity Anaylsis

VARIATION ON ELECTRICITY PRICE UNTIL 2011		
Projected Situation	**MWh Price**	**Project IRR**
0%	**R$ 124.52**	**9.27%**
5%	R$ 130.75	9.33%
10%	R$ 136.97	9.4%
VARIATION ON INVESTMENT TOTAL AMOUNT		
Projected Situation	**Investment**	**Project IRR**
0%	**R$ 235,882,000**	**9.27%**
-10%	R$ 212,293,800	10.25%
-5%	R$ 224,087,900	9.74%
VARIATION ON O&M COST		
Projected Situation	**O&M Cost**	**Project IRR**
0%	**R$ 4.00/MWh**	**9.27%**
-10%	R$ 3.60/MWh	9.31%
-5%	R$ 3.80/MWh	9.29%

The total amount of investment is the main item which can affect project's cash flow. The investment's projection is based on macroeconomic, climatic and technologic scenario that shows uncertainties which might burden the investment and to cause a total amount increase. Therefore, the total amount of investment reduction scenario, presented on Sensitivity analysis, is difficult to occur.

The electricity price was changed just until 2011, because, in this period, the company does not have Contracts of Power Purchase Agreement, called PPA, still signed. For the remainder concession period, Monjolinho Energética S.A. has PPAs, where the electricity price was negotiated to a value of R$ 124.52/MW

The sensitivity analysis demonstrates that the Monjolinho Project is not financially attractive once the entrepreneurship's internal rate of return is lower than the reference indicators in all scenarios analyzed.

The tool for demonstration an assessment of additionality says that:

"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)."

Therefore, as the sensitivity analysis having shown that the proposed activity is not attractive in the financial point of view, we should proceed to the fourth step (the analysis of common practices).

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

It is observed that there are in the South Region of the Country, region where HPP Monjolinho (Alzir dos Santos Antunes) is located, entrepreneurships with activities similar to those of the project being proposed.

It follows a summary of the numbers of electricity generation's entrepreneurships in operation in the Country's South Region, according information present in ANEEL's website:

Table 14 – Number of electricity generation's entrepreneurships in operation in the Country's South Region (Source: ANEEL[13] – March/2008)

Number of Entrepreneurships in Operation		
Type	**Quantity**	**%**
CGH	87	29.2
EOL	7	2.3
PCH	87	29.2
UHE	38	12.8
UTE	79	26.5
Total	**298**	**100**

Caption for Table 14:

- *CGH: Hydro Power Plant Central Generation (Installed Capacity smaller than 1 MW)*
- *EOL: Wind Power Plant*
- *PCH: Small Hydro Power Plant (Installed Capacity Greater than 1 MW and Smaller than 30 MW)*
- *UHE: Hydro Power Plant (Installed Capacity Greater than 30 MW)*
- *UTE: Thermal Power Plant*

The table presented show that 12.8% of electricity generation entrepreneurships in the southern region of the country are similar to the project Monjolinho's activities. The greatest part of these entrepreneurships has been implanted by state companies or organs, within the national energy development politics, when the sector was still centrally ruled. At that time, environmental legislation was softer and there was, according to Atlas of Electric Energy in Brazil[14],, the option of forming great reservoirs and for the inundation of big flooded areas in the construction of hydroelectric power plants in the country, with little consideration to the environmental aspects of the projects.

As examples of hydroelectric power plants similar to Project Monjolinho, implanted in the South Region, it can be cited HPP Passo Fundo, whose operation started in 1973, with an installed capacity of 220 MW and flooded area of 229.02 km² and the HPP Passo Real, with an installed capacity of 220 MW and a flooded area of 153.5 km², whose operation also started in 1973. Both entrepreneurships were developed by state companies.

[13] http://www.aneel.gov.br/area.cfm?idArea=15&idPerfil=2

[14] Atlas de Energia Elétrica do Brasil / Agência Nacional de Energia Elétrica, Página 45. – Brasília: ANEEL, 2002.

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

In spite of the existence of projects similar to Monjolinho Project's project activity in operation in the south region of the country, it is necessary to establish peculiar characteristics of these entrepreneurships that do not allow them to be configured as a common business scenario in the country.

According to the Atlas of Electric Energy in Brazil[15], the hydroelectric energy generation in Brazil is constituted essentially by major entrepreneurships. According to this study, the 23 hydroelectric power centrals of the country with a generation capacity of over 1,000 MW correspond to 71.4% of its installed capacity. Entrepreneurships of this magnitude present, for their generation capacity and consequent capacity of revenues, a great economic viability.

Still according to ANEEL, in the study mentioned above[16], the use of hydraulic potentials in Brazil to the generation of electric energy has historically demanded the formation of great reservoirs and inundation of big flooded areas. These constructions have used, in the majority of the cases, water accumulation reservoirs and regulations of water flow that provoked alterations in the regimen of water and the formation of microclimates, favoring, damaging or even extinguishing certain species.

Other fact that must be highlighted is that, analyzing the history of Brazilian electrical sector, it is verified that in the past the country's legislation did not incorporate the environmental variable in national electric sector planning. However, facing the undesirable social-environmental impacts resulting from the implantation of hydroelectric entrepreneurships, a series of legal demands that aim at avoiding and mitigating the environmental effects of this kind of project have become demands of the conceding power and of the legislative organs. With this, new investments, in the implantation of hydro electrical entrepreneurships in Brazil, are demanded from the investors.

HPP Monjolinho (Alzir dos Santos Antunes) is an entrepreneurship that possesses 74 MW of installed capacity and 43.1 MW of assured energy, being different, therefore, of the great national hydro electrical sites and not having the enormous potential of revenues of this kind of entrepreneurship. Moreover, HPP Monjolinho (Alzir dos Santos Antunes) is a run-of-the-river power plant that has a power density of 13.55 MW/km², with a flooded area of 5.46 km², presenting low environmental impacts and that considers in its planning a series of investments in programs and environmental actions that did not exist when there was the implantation of the greatest part of hydroelectric power plants in the Southern Region. This way, the implantation of this project does not count on large revenues from the great Brazilian hydroelectric entrepreneurships and has minimal environmental impacts that demand investment and, for these characteristics, its cash flow presents return rates below the markets references and the revenue from selling certified emission reduction becomes important to make the project possible.

It is also interesting to notice that as mentioned in sub-step 4.a, the number of hydroelectric power plants in the southern region of the country corresponds to only 12.8% of the entrepreneurships of its energetic matrix, presenting a greater concentration of small hydroelectric power plants and thermoelectric power plants. This greater quantity of small hydroelectric power plants in operation is directly associated to economical and tax benefits conceded by the Federal Government and to the creation, through the law nº 10,438, in April 26, 2002, of the Program PROINFA. The massive presence of thermoelectric power

[15] Atlas of Electric Energy in Brazil / National Agency of Electric Energy, page 32. (*Atlas de Energia Elétrica do Brasil / Agência Nacional de Energia Elétrica, Página 32. – Brasília: ANEEL, 2002.*)

[16] Atlas of Electric Energy in Brazil / National Agency of Electric Energy, pages 45-46. (*Atlas de Energia Elétrica do Brasil / Agência Nacional de Energia Elétrica, Páginas 45-46. – Brasília: ANEEL, 2002.*)

plants in the region is closely related to the fact that the region detains 90% of the country's natural coal reserves, favoring thermoelectric power plants implantation.

With this, we perceive that the reduced number of hydroelectric centrals is responsible for a great part of the country's installed capacity and that the hydroelectric power plants are not the main component in terms of number of entrepreneurships of the energetic matrix in the southern region of Brazil. Furthermore, it is possible to see that part of the hydroelectric entrepreneurships built in Brazil in the past had a high installed capacity, not respecting or establishing as a priority environmental questions, as it will happen in Monjolinho Project. These characteristics make Monjolinho Project singular among the other entrepreneurships.

SATISFIED/APPROVED – Project is ADDITIONAL

B.6. Emission reductions:

B.6.1. Explanation of methodological choices:

According to ACM0002 methodology (version 07), the emission reduction are calculated as follows:

$$ERy = BEy - PEy - LEy \qquad \textbf{Equation 4}$$

Where:

ERy = Emission Reduction in year y (t CO_2e/yr)
BEy = Baseline emissions in year y (t CO_2e/yr)
PEy = Project emissions in year y (t CO_2e/yr)
LEy = Leakage emissions in year y (t CO_2e/yr)

BEy Calculation (Baseline emissions in year y (t CO_2e/year)

The baseline methodology ACM0002 establishes that baseline emissions include only CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity. The baseline emission is calculated as follows:

$$BEy = (EGy - EG_{baseline}) * EF_{grid,CM,y} \qquad \textbf{Equation 5}$$

Where:

BEy = Baseline Emission in year y (t CO_2e/year)
EGy = Electricity supplied by the project activity to the grid (MWh)
$EG_{baseline}$ = Baseline electricity supplied to the grid in case of modified or retrofit facilities (MWh). For new power plants this value is taken as zero.
$EF_{grid,CM,y}$ = Combined margin CO_2 emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an electricity system"

For the ex-ante estimation, it was considered for the variable EGy the HPP Monjolinho (Alzir dos Santos Antunes) `s assured electricity. During the crediting period, EGy will be the net electricity delivered to the Grid by the project activity.

The HPP Monjolinho is a new power plant to be connected to the interconnected grid, therefore, the $EG_{baseline}$ is 0 (zero).

The combined margin emission factor is calculated as follows:

$$EF_{grid,CM,y} = EF_{grid,OM,y} \times w_{OM} + EF_{grid,BM,y} \times w_{BM}$$

Equation 6

Where:
$EF_{grid,BM,y}$ = Build margin CO_2 emission factor in year *y* (tCO_2e/ MWh)
$EF_{grid,OM,y}$ = Operating Margin CO_2 emission in year *y* (tCO_2e/ MWh)
W_{OM} = Weighting of operating margin emissions factor (%)
W_{BM} = Weighting of build margin emissions factor (%)

The tool to calculate the emission factor for an electricity system recommends that the following default values should be used for W_{OM} and W_{BM}:

- Wind and Solar power generation project activities: W_{OM} = 0.75 and W_{BM} = 0.25 for the first crediting period and for subsequent crediting periods.
- All other projects: W_{OM} = 0.5 and W_{BM} = 0.5 for the first crediting period, and W_{OM} = 0.25 and W_{BM} = 0.75 for the second and third crediting period, unless otherwise specified in the approved methodology which refers to this tool.

This way, for Monjolinho Project, it was adopted the following weights: W_{OM} = 0.50 and W_{BM} = 0.50.

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

(a) Simple OM, or
(b) Simple Adjusted OM, or
(c) Dispatch data analysis OM, or
(d) Average OM

The method chosen to calculate Monjolinho Project's emission factor was the Simple Adjusted OM. The project will use an ex ante option using a 3-year generation-weighted average, based on the most recent data available at the time of submission of the CDM-PDD to the DOE for validation (years of 2005 to 2007).

The Simple Adjusted OM can be applied because the low-cost/must run resources constitues more than 50% of total grid generation. The detailed data to use option (b) were supplied by ONS (System National Operator from the Portuguese: Operador Nacional do Sistema)

The Simple Adjusted OM emission factor is a variation of the Simple OM, where the power plants/units (including imports) are separated in low-cost/must run power sources (k) and other power sources (j). It will be calculates as follows:

Equation 7:

$$EF_{grid,OM\text{-}adj,y} = (1-\lambda_y)\times\frac{\sum_j EG_{j,y}\times EF_{EL,j,y}}{\sum_j EG_{j,y}} + \lambda_y \times \frac{\sum_k EG_{k,y}\times EF_{EL,k,y}}{\sum_k EG_{k,y}}$$

The description of the variables above are exposed on "Tool to calculate the emission factor for an electricity system", available at: http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html.

In the cases of South/Southeast/Midwest Interconnected Subsystem, it is assumed that all low-cost/must run power sources produce zero emissions, and this way:.

$$\frac{\sum_k EG_{k,y}\times EF_{EL,k,y}}{\sum_k EG_{k,y}} = 0$$

The Lambda Factors (λ) were calculated according requirements of the methodology according to the following:

λ = _Number of hours low-cost must-run resources are on the margin in year y /8760 hours per year

The build margin emission factor of each crediting period is calculated as follows:

$$EF_{grid,BM,y} = \frac{\sum_m EG_{m,y}\times EF_{EL,m,y}}{\sum_m EG_{m,y}}$$

Equation 9

Where:

$EF_{grid,BM,y}$ = Build margin CO_2 emission factor in year *y* (tCO_2e/MWh);
$EG_{m,y}$ = Net quantity of electricity generated and delivered to the grid by power unit *m* in year *y* (MWh);
$EF_{EL,m,y}$ = CO_2 emission factor of power unit *m* in year *y* (tCO_2e/MWh);
m = Power units included in the build margin;
y = Most recent historical year for which power generation data is available.

The sample group of power units *m* used to calculate the build margin consists of either:

(a) The set of five power units that have been built most recently, or
(b) The set of power capacity additions in the electricity system that comprise 20% of the system generation (in MWh) and that have been built most recently.

The sample of electricity generation, in this case, means 20% of the total produces in the most recent year (2007), since the five power units built most recently comprise less than 20% of the system generation

In terms of vintage of data, project participants chose the option 1 which establishes that for the first crediting period, it must be calculated the build margin emission factor ex-ante based on the most recent information available on units already built for sample group *m* at the time of CDM-PDD submission to

the DOE for validation. For the second crediting period, the build margin emission factor should be updated based on the most recent information available on units already built at the time of submission of the request for renewal of the crediting period to the DOE. For the third crediting period, the build margin emission factor calculated for the second crediting period should be used. This option does not require monitoring the emission factor during the crediting period.

PEy Calculation (project emissions in year y (t CO_2e/year))

According to the methodology adopted, for hydro power project activities that result in new reservoirs and hydro power project activities that result in the increase of existing reservoirs, the project proponents shall account for project emissions, estimated as follows:

(a) If the power density (PD) of power plant is greater than 4 W/m2 and less than or equal to 10 W/m2:

$$PEy = \frac{EF_{Res} * TEGy}{1000} \qquad \textbf{Equation 10}$$

Where:

PEy = Emission from reservoir expressed as tCO_2e/ano;
EF_{Res} = is the default emission factor for emissions from reservoirs, and the default value as perEB23 is 90 Kg CO_2e/MWh;
TEGy = Total electricity produced by the project activity, including the electricity supplied to the grid and the electricity supplied to internal loads, in year y (MWh)

(b) If the power density of the project activity is greater than 10 W/m2, PEy = 0.

As described on the table 6 on the item B.2, the power density of HPP Monjolinho (Alzir dos Santos Antunes) is higher than 10 W/m2. Therefore, for Monjolinho Project, PEy = 0.

LEy Calculation (leakage emissions in year y (t CO2e/year))

The main emissions potentially giving rise to leakage in the context of electric sector projects are emissions arising due to activities such as power plant construction, fuel handling (extraction, processing, and transport), and land inundation. According to the Methodology applied, the project participants do not need to consider these emission sources as leakage. The project participants will not claim any credit for the project on account of reducing these emissions below the level of the baseline scenario. Therefore, for Monjolinho Project, the leakage emissions represented by LEy is 0 (zero).

Project Emissions Reductions

To summarize, the project emission reductions are calculated based on equation 4 of this PDD, in which PEy is zero (0) and LEy is zero (0). Therefore, the project emission reductions are calculated according to equation 5 of this PDD, where ERy = BEy = (EGy – EGbaseline) * EFgrid,CM,y.

As HPP Monjolinho (Alzir dos Santos Antunes) is a new power plants, EGbaseline is 0 (zero) and the emission reductions are calculated as the simple product between the electricity supplied by the project activity to the grid times the combined margin emission factor, where the operating margin emission factor will be calculated according to Simple Adjusted OM emission and the build margin emission factor will be calculated through the option 1 which considers that this emission factor must be established ex-ante. Besides it will be considered 50% for the weights that forms the combined margin emission factor.

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

Data / Parameter:	Cap_{BL}
Data unit:	W
Description:	Installed capacity of the hydro power plant before the implementation of the project activity. For new hydro power plant, this value is zero.
Source of data used:	Project Site
Value applied	0
Justification of the choice of data or description of measurement methods and procedures actually applied	As HPP Monjolinho (Alzir dos Santos Antunes) is a new power plant, this value is 0 (zero).
Any comment :	

Data / Parameter:	A_{BL}
Data unit:	m^2
Description:	Area of the reservoir measured in the surface of the water, before the implementation of the project activity, when the reservoir is full (m^2). For new reservoirs, this value is zero.
Source of data used:	Project Site
Value applied	0
Justification of the choice of data or description of measurement methods and procedures actually applied	As HPP Monjolinho (Alzir dos Santos Antunes) is a new power plant, this value is 0 (zero).
Any comment :	

Data / Parameter:	**Combined Margin Emission Factor ($EF_{CM,2005-2007}$)**
Data unit:	t CO_2/MWh
Description:	Combined Margin Emission Factor
Source of data used:	ONS –National System Operator
Value applied	0.2654

Justification of the choice of data or description of measurement methods and procedures actually applied	Calculated ex-ante with the application of the Tool to calculate the emission factor for an electricity system. It was calculated through data supplied by ONS for the South/Southeast/Midwest of the years 2005,2006 and 2007.
Any comment :	

Data / Parameter:	**Operating Margin Emission Factor ($EF_{OM,2005-2007}$)**
Data unit:	t CO_2/MWh
Description:	Operating Margin Emission Factor
Source of data used:	ONS –National System Operator
Value applied	0.46
Justification of the choice of data or description of measurement methods and procedures actually applied	Calculated ex-ante with the application of the Tool to calculate the emission factor for an electricity system.
Any comment :	

Dado / Parâmetro:	**Build Margin Emission Factor ($EF_{BM,2005-2007}$)**
Unidade do dado:	t CO_2/MWh
Descrição:	Build Margin Emission Factor
Fonte do dado usado:	ONS –National System Operator
Valor Aplicado	0.0709
Justificativa da escolha do dado ou descrição dos métodos e procedimentos de medição realmente aplicados:	Calculated ex-ante with the application of the Tool to calculate the emission factor for an electricity system.
Comentários:	

B.6.3 Ex-ante calculation of emission reductions:

As described on the item B.6.1, the project emissions reduction will be calculated based on equation 4, where it must be considered PEy as 0 (zero) and LEy as 0 (zero). Therefore, the project emissions reduction will be calculated according equation 5, as follows:

$$ERy = BEy = (EGy - EG_{baseline}) * EF_{grid,CM,y} . \quad \textbf{Equation 5}$$

Where:

ERy = Emission Reduction in year y (tCO_2e/ano)
BEy = Baseline emissions in year y (tCO_2e/ano)
EGy = Electricity supplied by the project activity to the grid (MWh)
$EG_{baseline}$ = Baseline electricity supplied to the grid in case of modified or retrofit facilities (MWh). For new power plants this value is taken as zero. For Monjolinho Project, this value is zero.
$EF_{grid,CM,y}$ = Combined margin CO_2 emission factor.

It follows below the description about Monjolinho Project's emissions reduction calculation.

(EGy – EGbaseline) Calculation

Table 15 – (EGy – EGbaseline) Calculation

Period	Monjolinho Project		
	EGy	EGbaseline	EGy-EGbaseline
2009	46.944	-	46.944
2010	372.384	-	372.384
2011	372.384	-	372.384
2012	372.384	-	372.384
2013	372.384	-	372.384
2014	372.384	-	372.384
2015	372.384	-	372.384
2016	310.320	-	310.320
Total	2.591.568	-	2.591.568

Assumptions:

- EGy and EGbaseline projections were made assuming power plant operation during 24 hours per day, 30 days per month and 12 months per year;
- Prevision for the first turbine generator's beginning operation on 01/11/2009 and the second one in 31/12/2009. The year of 2009 accounts just for the generation from November to December (01/11/2009 to 31/12/2009);
- The year of 2016 accounts just for 10 months of generation (01/01/2016 to 30/10/2016);
- The electricity generation is projected according to HPP Monjolinho (Alzir dos Santos Antunes)' s assured energy.

Emission Factor Calculation

The emission factor was calculated according to the Simple Adjusted OM Method, using data made available by ONS for the years 2005 to 2007. Data and spreadsheets used to calculate the emission factor were available to the DOE in the Validation Process. More information about the emission factor calculation are available in the annex 3.

The table below shows a summary of the main parameters involved on the emission factor calculation:

Table 16 – EFgrid,CM,2005-2007 Calculation

Emission factors for the Brazilian South-Southeast-Midwest interconnected grid			
Baseline	EF_{OM} [tCO_2/MWh]	λ_y	Load [MWh]
2007	1.00	0.5452	339,727,667
2006	0.8071	0.4219	318,934,920
2005	0.9653	0.5247	313,880,076
	$EF_{OM,simple\text{-}adjusted}$ [tCO_2/MWh]	$EF_{BM,2007}$	Default EF_y [tCO_2/MWh]
	0.4600	0.0709	0.2654
	Alternative weights	Default weights	
	w_{OM} = 0.75	w_{OM} = 0.5	
	w_{BM} = 0.25	w_{BM} = 0.5	

The emission factor which will be used for **Monjolinho Project**, calculated ex-ante, is 0.2654.

Therefore, the ex-ante estimation of project emission reduction is shown through the table below:

Table 17 – Ex-ante estimation of Monjolinho Project's Emissions Reduction (tCO_2)

Year	Total (tonnes of CO2 e)
2009	12.460
2010	98.835
2011	98.835
2012	98.835
2013	98.835
2014	98.835
2015	98.835
2016	82.363
Total	687.834

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

Table 18 – Summary of the ex-ante estimation of emission reduction

Year	Estimation of project activity emissions (tonnes of CO2 e)	Estimation of baseline emissions (tonnes of CO2 e)	Estimation of Leakage (tonnes of CO2 e)	Estimation of overall emission reductions (tonnes of CO2 e)
2009	0	12.460	0	12.460
2010	0	98.835	0	98.835
2011	0	98.835	0	98.835
2012	0	98.835	0	98.835
2013	0	98.835	0	98.835
2014	0	98.835	0	98.835
2015	0	98.835	0	98.835
2016	0	82.363	0	82.363
Total (tCO2 e)	0	687.834	0	687.834

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

B.7.1 Data and parameters monitored:

The consolidated baseline methodology for grid-connected electricity generation from renewable sources, version 07, must be applied together with the monitoring methodology present into that methodology.

Based on the applied methodology and on what was described on the item B.6.1, there are neither leakage nor project emissions to be monitored. Therefore, the parameters to be monitored are just the project's installed capacity, the electricity generation by the project and the project activity's power plants reservoirs area.

This energy measurement is essential to verify and monitor the GHGs emission reduction. It is necessary, therefore, to use meter equipment to register and check the electricity generated by the unit. The Monitoring Plan (item B.7.2) allows the calculation of GHG emissions generated by the project activity in a direct manner, applying the baseline emissions factor.

All data collected as part of monitoring will be archived and be kept at least for 2 years after the end of the last crediting period. All measurements will be conducted with calibrated measurement equipment according to Brazilian industry standards.

Data / Parameter:	**Electricity Generated (EG_y)**
Data unit:	MWh
Description:	Electricity supplied by the project activity to the grid
Source of data to be used	Project Activity Site
Value of data applied for the purpose of calculating expected emission reduction in section B.5	The HPP Monjolinho (Alzir dos Santos Antunes)'s assured energy was used, with a value of 43.1 MW, according to the Concession Contract, for the purpose of calculating expected emission reduction in section B.5.
Description of measurement methods and procedures to be applied (if any)	Spreadsheets will be used, obtained directly from the meters with information generated hourly or within every 15 minutes. Monthly, the information will be checked with the generation spreadsheets available at the CCEE's Website. Besides, information of generation can be checked by receipt of sales, if it is necessary to do so.
QA/QC procedures to be applied:	The uncertainty level for these data is low. They will be used to calculate the emission reductions. The electricity generated will be monitored by the project participants and it will be checked by spreadsheets available at the CCEE`s Website (information comparison between operation data and CCEE reports).
Any comment:	*CCEE - Entity responsible for measurements, accounting and settlement on Brazilian electric energy market.

Data / Parameter:	**Total Electricity Generated (TEG_y)**
Data unit:	MWh
Description:	Total electricity produced by the project activity, including the electricity supplied to the grid and the electricity supplied to internal loads, in year y.

Source of data to be used:	Project Activity Site
Value of data applied for the purpose of calculating expected emission reduction in section B.5	This data was not used to calculate the expected emission reduction, but it can be considered as the installed capacity of the HPP Monjolinho (Alzir dos Santos Antunes), according to the Installation License (LI nº 886/2008-DL), with a value of 74 MW.
Description of measurement methods and procedures to be applied (if any)	Spreadsheets will be used, obtained directly from the meters with information generated hourly or within every 15 minutes.
QA/QC procedures to be applied:	The uncertainty level for these data is low. The electricity generated will be monitored by the project participants.
Any comment:	

Data / Parameter:	**Cap_{PJ}**
Data unit:	W
Description:	Installed capacity of the hydro power plant after the implementation of the project activity.
Source of data to be used:	Project Site
Value of data applied for the purpose of calculating expected emission reduction in section B.5	This data was not used to calculate the expected emission reduction. But it can be considered the value of 74 MW, according the Installation License (LI nº 886/2008-DL) issued by FEPAM.
Description of measurement methods and procedures to be applied (if any)	The installed capacity will be monitored annually by Aneel, or by sub-hired companies, according recognized standards.
QA/QC procedures to be applied:	The uncertainty level for these data is low. The installed capacity is determined on the project's beginning and it will be monitored by the Regulator Agent.
Any comment:	

Data / Parameter:	**Area of the reservoir (A_{PJ})**
Data unit:	m^2
Description:	Area of the reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir is full.
Source of data to be used:	Project Site
Value of data applied for the purpose of calculating expected emission reduction in section B.5	The HPP Monjolinho (Alzir dos Santos Antunes) `s area of the reservoir was used for the purpose of calculating expected emission reduction in section B.5. It was used a value of 5,460,000 m^2.
Description of measurement methods and procedures to be applied (if any)	It will be performed a topographical measurement to measure the area of the reservoir after it is completely full.
QA/QC procedures to	

be applied:	
Any comment:	

B.7.2 Description of the monitoring plan:

The Monitoring Plan is elaborated according to the Monitoring Methodology included in the consolidated baseline methodology for grid-connected electricity generation from renewable sources ACM0002, version 07.

Responsibilities

- Operation and Maintenance Board: responsible for activities related to the plant's operation and maintenance.

- Special Measurement Area, linked to Operation and Maintenance Board: responsible for collecting information directly from the HPP Monjolinho (Alzir dos Santos Antunes)'s meters and for sending it to Electric Power Commercialization Chamber (CCEE). The Special Measurement Area is also responsible for the consolidation and analysis of monthly generation spreadsheets and for System of Energy Data Collection (SCDE), through the collected data consistence analysis and software operation monitoring.

- Measurement Outsourced Agent: Part of the Special Measurement Area's responsibility can be outsourced with a Measurement Agent's hiring. In this case, the Special Measurement Area is responsible for supervising the work performed by the Measurement Outsourced Agent.

- Electric Power Commercialization Chamber (CCEE): it is responsible for implantation, operation and maintenance of SCDE, to enable the collection of electric energy's data for the use of Accounting and Settlement System (SCL), aiming at assuring the accuracy of the amounts measured, as well as the meeting of the required deadlines

Process Description

I – Procedure of Generation Data Collection

There are two data collection channels in each measurement points. A channel is used by the company for direct collection and the other one is used by CCEE for data sent validation.

In the company, Special Measurement Area is responsible for obtaining data directly from the meters and make available in files on xml format. Data obtained by the company are sent daily to CCEE through SCDE system which makes the National Interconnected Grid measurement point generation and consumption data's collection and treatment.

The Special Measurement Area is also responsible for generating, at each month in the first working day, based on consultation from a meters` database, the spreadsheets with the generation data, consolidated hourly, regarding the previous month. These files are sent to CCEE in TXT format.

The procedure quoted above might be outsourced through a Measurement Agent's hiring. In this case, the Special Measurement Area is responsible for supervising the work performed by the Measurement Outsourced Agent

In CCEE, the collected data, through SCDE, are transferred to the software SCL to accounting and financial clearance based on the CCEE's Rules and Procedures for Commercialization

II – Data Consolidation Procedure:

CCEE compares data available and if an inconsistency occurs, it will be generated a non-conformity report that will verify with CCEE the cause for the disagreement between the information

In case of unavailability of any measurement point, due to maintenances, commissioning or for any other reason, the methodology of data estimation will be used according to the item 14.3 of the Commercialization Procedure PdC ME.01.

III – Data Storage:

The generation information, both the internally generated and the spreadsheets generated through the CCEE website, are electronically stored by the Operation and Maintenance Board.

Periodically, the Information Technology Area accomplishes a insurance backup for all company`s data through a Data Server *backup.*

All data collected as part of the monitoring will be archived and be kept for at least 2 years after the end of the last crediting period.

IV – Confronting of the internal generation data with the third part reports

The internal information might be confronted with data available on CCEE *website*.

V – Calibration of Meters (measuring tools):

The calibration of meters will follow what was described on the document elaborated by ONS – Sub module 12.3 - Maintenance of the measurement system for billing, which establishes that:

(a) The periodicity for the responsible agent's preventive maintenance for Measurement System for Billing (SMF) is of 2 (two) years at the most. That periodicity can be altered in function of the occurrence history observed for all 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 starts to apply from the inspection date.

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)

The baseline study and monitoring methodology for the project activity were elaborated by Enerbio Consultoria and they were completed on 28/03/2008. Enerbio Consultoria is also a project participant.

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

Eduardo Baltar de Souza Leão
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Porto Alegre, Brazil
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SECTION C. Duration of the project activity / crediting period

C.1 Duration of the project activity:

C.1.1. Starting date of the project activity:

16/07/2007 (Construction's Beginning)

16/07/2007 is the issue date of the Construction Service Order (from the Portuguese: Ordem de Serviço de Construção) to COMAX Terraplenagem Ltda. to the service of common excavation of left and right margins and ground work for construction site of HPP Monjolinho (Alzir dos Santos Antunes).

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

40 years

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

The project activity will use renewable crediting period.

C.2.1. Renewable crediting period

7 years and it can be renewed at most two times

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

The date which occurs later between:

- 01/07/2009 (Company's Internal Target for Operation Beginning);
- 01/11/2009 (Prevision for Operation Beginning by ANEEL);
- Project`s Registration in CDM EB.

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

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

The growing global concern on sustainable resources is leading to a requirement for more sensitive environmental management practices. This is increasingly reflected in legislation and policies around the world. In Brazil, the situation is not different. The licensing policies and environmental rules are very demanding, just as the best international practices.

In Brazil, it is required to 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, a series of licenses from the pertinent environmental agency (federal and/or local, depending on the project).

To obtain all the environmental licenses, every hydroelectric project must mitigate, when it exists, the following impacts:

- Inundation of indigenous lands and slave historic areas – authorization for that 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;
- Inundation of cemeteries and other sacred locations.

The process begins with an environmental impact study (EIA) undertaken by the entrepreneur and it follows with the previous analysis (preliminary studies) made by the local environmental department. Afterwards, if the project is considered environmentally feasible, the sponsors have to prepare an environmental assessment, which is basically composed of the following information:

- Reasons to implement the project;

- Project Description, 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 (LP), which reflects the positive understanding of the local environmental agency on the project environmental concepts.

To obtain the installation license (LI), it is necessary to present (a) additional information about the previous assessment; (b) a new simplified assessment; or (c) the Environmental Basic Project (PBA) according to the resolution of the environmental agency informed on the LP.

The operation license (LO) is requested during the final phase of the construction and it is obtained after the entrepreneur proves that all exigencies made by the local environmental agency were fulfilled.

Below, it follows the HPP Monjolinho (Alzir dos Santos Antunes)'s historical licenses, which were provided to the Designated Operational Entity in the validation stage

- Prior License (LP) - nº 1065/2005 – DL
  - Signed on:19/12/2005
  - Valid until: 19/12/2007

- Installation License (IL) - nº 886/2008 – DL
  - Signed on: 15/08/2008.
  - Valid until: 23/03/2010.

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. The Monjolinho Project presents little necessity of reservoir's flooded area and satisfies the several demands of the state's environment legislation and of the Brazilian electric system, having the necessary licenses for its implantation.

It will be developed 24 programs and actions, aiming at minimizing and mitigating the environmental impact of entrepreneurship in the physical, biotic and anthropic fields.

The whole programs that compose the Basic Environmental Project were elaborated according to the latest management techniques of natural and social resources. It follows below in detail some actions which will be executed on Monjolinho Project.

Program of control of erosive processes

This program has the objective of following the occurrence and development of the erosive processes in the margins of the reservoir, avoiding the silting and the consequent reduction of its useful life, besides reintegrating the areas of the working fields and of the mandatory excavations in the regional landscape. The program's activities consist in data survey, implantation of a system of geographical information and of a phenomenological modeling, field surveys and laboratory tests which will support the elaboration of the plan for stabilizing erosive figures and landslides.

After these activities, a monitoring project of the hillsides will be implanted and, when necessary, preventive or corrective measures will be executed in order to control erosions and stabilization processes.

Monitoring Program of subterraneous waters

The main program has the objective of monitoring the static and freatic level and the quality of water of the identified wells in the HPP Monjolinho (Alzir dos Santos Antunes)'s area of direct influence, evaluating the possible effects of the implantation and operation of this HPP in the variation of the freatic level and quality of water in these wells. This program shall be integrated to the Superficial Water Quality Monitoring Program and also to the Contribution Basin Management.

The activities predicted in the PBA embrace complementary studies to the identification of existing wells in the area of reservoir`s influence and monitoring the quality of water of the static and freatic levels of the selected wells. In the reservoir areas monitoring piezometers will be installed.

Program of recuperation of degraded areas

This program seeks to establish procedures to reduce the impacts caused by the implantation of the HPP Monjolinho (Alzir dos Santos Antunes) and to recuperate the degraded areas of the working field, aiming at its future use. The activities in this program involve periodic meetings with the company executing the sites. In these meetings, initially, responsibilities will be defined and activities to capacitate the ones involved in the execution of the program will be realized.

After this, Monjolinho Energética S.A. and the sub-hired company responsible for the work will provide the necessary data to the identification of the areas to be recovered (plants, schedules and other information that clarify the uses of each area along the execution of the site). Based on that information, Monjolinho Energética S.A. will start the planning of the recuperation activities, establishing which preventive/corrective measures must be adopted.

Superficial Water Quality Monitoring Program

The objective of this program is to monitor the limnologic parameters of the rivers Passo Fundo and Erechim, in the HPP`s area of influence, gathering the technical information necessary to the identification and mitigation of possible impacts generated by the formation of the reservoir on the quality of water, and to the maintenance of quality classes and their prepWhererant uses.

This program should be integrated to the Monitoring Program of Subterraneous Waters and to the Contribution Basin Management program. Monthly campaigns are predicted for sampling the physical-chemical and biotic parameters during the period of one year from the beginning of the construction, becoming held every three months till the filling of the reservoir. During this filling, the sampling will be done weekly. Afterwards, the campaigns will be monthly during the first six months of the reservoir, passing to a three-month basis after this period. To this program performance reports are predicted to be written every three months. After the first year of monitoring, the periodicity of the samples must be evaluated along with the state environmental organ – FEPAM.

Contribution Basin Management program

This program's main objective is to conciliate the anthropic use of the reservoir's contribution basin, looking for ideal conditions for environmental generation, conservation and security. Its activities will be developed throughout the whole execution of the PBA, until May 2010.

Environmental education program

Activities along the school communities in the entrepreneurship's influence area will be realized, with focus on the capacitating of teachers of municipal state education network which act in the municipalities covered by the entrepreneurship, besides capacitating activities with the workers of the hired companies and educational activities with residents surrounding the reservoir. This program must have intense integration with the programs of Social Communication, Prevention of Accidents and Public Health and Conservation and Use of the Reservoir Waters and its Surroundings.

Reforestation program

In constant and intense correlation with the Flora Rescue Program, this program aims at elaborating reforestation projects in the permanent preservation areas and other available for planting, besides the production and supply of branches obtained from seeds collected in the area of the entrepreneurship's direct influence, seeking the preservation of the local genetic material. Until the phase of reservoir's fulfillment, it is predicted the planting of approximately 2 thousands branches of native species

Flora rescue and salvation program

Through this program, inventories to the identification and localization of samples of the local flora will be realized, with the interest of conservation. Seeds and other vegetable material will be collected throughout the period of implantation of the HPP, with the objective of creating a germplasm bank, allowing the production of branches that will be used in the Reforestation Program. For this, it will be implanted a forest nursery with a capacity to produce 60 thousand branches per year.

Macrophytes monitoring program

This program has the objective of surveying the macrophytes species present in the entrepreneurship's region, identifying the potential invaders and elaborating a plan to handle such species, controlling possible biological invasions. Prospecting campaigns will be executed in the region and, after the reservoir's filling, monitoring and control campaigns of the macrophyte population in the reservoir will take place every two months.

Fauna Rescue and Monitoring program

Throughout all the process of deforestation of the area to be flooded, two biologists and two assistants will remain on the field, being responsible for the execution of the mild rescue. Periodically, campaigns to monitor the fauna will be executed, with a staff composed by an entomologist, a herpetologist, an ornithologist and a mast zoologist, besides field assistants.

Samples of the insect fauna and other disease vectors that may occur in the region will be realized, according to the data presented in the diagnosis carried out. Along with the activities of Environmental Education, with the programs of Public Health and Use of the Reservoir's Surroundings, activities of prevention and control of diseases and infestation vectors will be developed. Besides, the data about the occurrence of hematophagous bats will be monitored, seeking to map the populations and to inform the state's Health and Agriculture Secretaries, as agreed in meeting with the Centro de Vigilância em Saúde do Rio Grande do Sul (Center of Health Vigilance of the state of Rio Grande do Sul).

Accident prevention and public health program

This program has as objectives: (i) to elaborate a system of epidemiologic vigilance, centered in the prevention of the introduction and control of existing vector; (ii) elaborate a program of worker's health, aiming at the workers in the site and the population involved, avoiding aggravations and permitting a better quality of life and (iii) to structure mechanisms of prevention of accidents with venomous animals, notably in the phases of deforestation, detour of the river and filling of the reservoir.

The environmental indicators used, always taking into consideration the site conditions prior to the entrepreneurship, are: (i) the profile of hospital morbidity; (ii) the profile of mortality, notably in groups of infectious-parasite, causes of the respiratory system and external; the prevalence of cases of accidents with venomous animals; (iii) the prevalence of endemic diseases or of compulsory notification. The workers admission and resignation exam, as well as periodic health tests adopted by the companies working in the implantation of the entrepreneurship, will constitute indicators of the program in the sphere of the worker's health.

Program of adequacy in traffic conditions

To satisfy the necessities of adequate roads to the traffic demanded by the development of the building site, it will be necessary to execute improvement in the roads that give access to the site, in special the interval of 7 km which will connect Nonoai to the construction site, with rectifications of design, adequacy to the draining system and signalizations.

This improvement should be executed in all the roads that will receive the traffic from the site, considering the increase in the flow which will last during the construction period. The alterations in the traffic will be considered under the aspect of increase in the road and urban traffic. The increase in the road traffic will reflect in the amplification of the flow of vehicles in the roads RS-480 and RS-486 and in the road that connects Nonoai to Faxinalzinho, which structures the region of the entrepreneurship`s implantation. This increase in the traffic will be due to the mobilization of equipment, transport of materials and of people allocated in the site, being represented by heavy and light vehicles. It is expected an increase in the intensity in the zones near the dam, mainly due to the transport of clayey soils, sand and crushed rock.

The aspect of urban traffic intensification will probably occur in the city of Nonoai, once a considerable amount of the economical movement coming from the construction site will be concentrated in its surroundings.

Program of social communication

Landscape transformations, such as the implantation of a HPP and all the alterations provoked by it generate impacts, curiosities and doubts among the population of the region, both in direct and indirect entrepreneurship's areas of influence.

In this context, the social communication performs a key role, once it attempts to minimize these feelings and involve the population with the project through the exchange of information, making use of the Program of Social Communication. This program's target people are the ones affected by the construction, the city's authorities, NGOs, syndicates, associations, communitary leaderships, the press and others that manifest interest.

The interest and manifestation of the population in relation to the themes covered are necessary and fundamental conditions so that this program becomes successful, both in the form of organization and in the progress of developed actions, which indicate the possibility of alterations and adaptations

throughout the execution of the program. Moreover, the interaction and the involvement of the entrepreneur with the population of the region are primary factors to the implantation of the program.

Program of conservation and use of the waters and their surroundings

The Environmental Plan of Conservation and Use of the Artificial Reservoir's Waters and its Surroundings, also named PACUERA, has the objective of establishing mechanisms to make an environmentally balanced use of the lake and its surroundings possible, according to the precepts of the legislation, to the necessities of the entrepreneurship and to the interaction with the society.

In order for PACUERA to reach this goal, it will be necessary that the users and authorities be conscious of the potentialities and frailties of the new context (the reservoir), from the knowledge which is passed on to them. The Plan should be developed aiming at mechanisms of protection of the environment quality through a Code of Usage and through a cartography zone that is simple and easily understood, searching for its operation by the municipalities and other managers.

Environment management program

The program will be executed by a multidisciplinary team, in order to guarantee the attendance to the current environmental legislation pertinent to the entrepreneurship, to promote the exchange of experiences among the environmental programs of PBA, and to guarantee the control of the execution, seeking the implantation from its totality.

This program's staff is responsible for the emission of all reports referring to the progress of PBA, as well as the relation entrepreneur-supervising organ. The environment management program is justified by the necessity of permanent exchange among the environmental programs in PBA.

This program should organize and make it compatible the implantation of environmental programs of PBA, enhancing and accompanying the stages in the execution of each one, as well as directly interfering in the search of synchronism among the activities and in the optimization of the results. The management should decide the beginning of reviews of the PBA whenever necessary to adjust the program and/or procedures, or due to new demands, as well as fulfilling the responsibility of interlocution with the licensing organs.

In order to perform these functions, the management staff should collect and compile the data generated by the implementation of the programs, in order to dispose the information organized and coherently to the execution of the PBA, facilitating the decision taking to the management. In the same way, all the information referring to the licensing should be considered, always bearing in mind the maintenance of feasible deadlines to the realization of the tasks to an efficient service of the demands of the licensing organs.

In the scope of this organ are included the activities and studies necessary to the licensing of energy transmission's line and of all road and accesses related to the entrepreneurship, even if this determines the opening of new processes of environmental licensing.

Environmental Plan for the Construction – EPC

During all entrepreneurship's implementation process, sub-hired companies will be oriented to adopt techniques which consider the best engineering solutions, aiming at the environmental protection. It will be activities of this program the support to sub-hired companies in the environmental management of the construction through the elaboration of an executive project of EPC; programs of control of accidents and fires; supervision of activities in the working areas and management of licenses and building

permission. The program has a direct relation to the Environmental Education to the development of education activities of the workers in the site.

SECTION E. Stakeholders' comments

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

According to Resolution nº 1 of Brazilian DNA, local stakeholder must be invited to comment the CDM Project.

Therefore, the project proponents sent letters to the following local stakeholders:

Table 19 – Local stakeholders consulted

Local Stakeholders	Name
Faxinalzinho	
City Hall	Mr. Irineu Bertani
Municipal Assembly	Mr. Irineu da Costa
Municipal Agriculture and Environmental Secretary	Mr. Ari Jorge Moreto
Nonoai	
City Hall	Mr. Ademar Dall'Asta
Municipal Assembly	Mr. Carlos Gosch
Environmental Department	Mr. José Moreira
Benjamin Constant do Sul	
City Hall	Mr.. Jairo Cina
Municipal Assembly	Mr. Leonor Cesar Grasieli
Environmental Department	Mr. Claudenir Luís Finato
Entre Rios do Sul	
City Hall	Mr. Volnei Luis Pedott
Municipal Assembly	Mr. Jerry Adriano Payer
Community Associations	
Association of Faxinalzinho Residents	Mr. Ido Marcon
Nonoai's Social Welfare House Love and Charity	Ms. Volnete Zanetti
Association of Nonoai's Children CEMACAAD	Ms. Nair Menegol
Patran	Mr. Fontana
APAE - Association of Fathers and Friends of Nonoai's Exceptional People	Mr. Carmem Debastiani
Commercial, Industrial, Service, Agriculture and Cattle Raising Faxinalzinho's Association	Mr. Edgar Luiz Valentini
District of Nonoai Attorney of Justice	Mr. Marcelo José da Costa Petry
Commercial, Cultural, Industrial, Service and Agriculture and Cattle Raising Nonoai's Association	Mr. Ademir Oliveira
Cultural Association of Community Radio Dissemination Benjamin Constant do Sul	Mr. Gilberto Lovato
Association of Benjamin Constant do Sul Residents	Mr. Arlindo Menegueti
Commercial Industrial Entre Rios do Sul Association	Mr. Mauri Antonio Benin
Others Local Stakeholder	
State of RS Attorney for Public Interest	Mr. Mauro Henrique Renner
Federal Attorney for Public Interest	Mr. Antonio Fernando Barros e Silva de Souza
Brazilian Forum of NGOs and Social Movements for Environment and Development	Mr. Rubens Born
State Environmental Agency	Mr. Carlos Otaviano Brenner de Moraes
Environmental Protection State Foundation Henrique Luis Roessler (FEPAM)	Ms. Maria Isabel Chiappetti

The letters were sent before the validation process and a 30 days term was given for the local stakeholders to make some pronunciation and giving opinions about Monjolinho Project. Besides the letters sent to local stakeholders, the PDD was available to public comments for the local stakeholders at the website www.enerbio-rs.com.br.

E.2. Summary of the comments received:

There was just a comment, carried out from Secretary of Agriculture and Environment of Faxinalzinho city.

The secretary of Agriculture and Environment of this city said that he is optimistic about the project and asked that, in the moment of production and supply of native seedlings to be planted in the outskirts of the dam and of the reservoir, some seedlings be passed to the Secretary with the objective of donating to farmers of some localities in the interior of the municipality. Through this action, the Secretary of Agriculture and Environment of Faxinalzinho seeks to promote the forestation and reforestation, increasing the area of native forests in all locations of the city.

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

MONEL incorporated the comment and the request made by the Secretary of Agriculture and Environment of Faxinalzinho in the Reforestation Program of HPP Monjolinho (Alzir dos Santos Antunes), establishing that, in the moment of production and supply of native seedlings to be planted in the area of the entrepreneurship's direct influence, it will be supplied to the Secretary of Agriculture and Environment native seedlings to be supplied to farmers in the interior of the city.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

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Represented by:	
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Annex 2

INFORMATION REGARDING PUBLIC FUNDING

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

Annex 3

BASELINE INFORMATION

The brazilian electricity system has been historically divided into two subsystems : The North-Northeast (N-NE) and the South-Southeast-Midwest (S-SE-CO). This is due mainly to the historical evolution of the physical system, which was naturally developed nearby the biggest consuming centers of the country.

The natural evolution of both systems continues to demonstrate that integration will happen in the future. In 1998, the Brazilian government announced the first leg of the interconnection line between S-SE-CO and N-NE. With investments of around US$ 700 million, the connection had the main purpose, in the government's view, at least, to help solve energy imbalances in the country: the S-SE-CO region could supply the N-NE in case it was necessary and vice-versa.

Nevertheless, even after the interconnection was establhished, technical papers continue to divide the Brazilian system in three (Bosi, 2000)[17]:

> "..where the Brazilian Electricity System is divided into three separates subsystems:
>
> (i) The South/Southeast/Midwest Interconnected System;
> (ii) (ii) The North/Northeast Interconnected System; and
> (iii) The Isolated Systems (which represent 300 locations that are electrically isolated from the interconnected systems)"

Moreover, the ACM002 suggests using the regional grid definition, in large countries with layered dispatch systems (e.g. state/provincial/regional/national), where DNA guidance is not available. A state/provincial grid definition may indeed in many cases be too narrow given significant electricity trade among states/provinces that might be affected, directly or indirectly, by a CDM Project Activiti.

Finally, one has to take into account that even though the systems today are connected, the energy flow between N-NE and S-SE-CO is heavily limited by the transmission lines capacity. Therefore, only a fraction of the total energy generated in both subsystems is sent one way or another. Is is natural that this fraction may change its direction and magnitude (up to the transmission line's capacity) depending on the hydrological patters, climate and other uncontrolled factors. But it is not supposed to represent a significant amount of each subsystem's electricity demand.

The approved methodology ACM0002 asks project proponents to account for "all generating sources serving the system". In that way, project proponents in Brazil should search for, and research, all power plants serving the Brazilian System.

However, information on such generating sources is not publicly available in Brazil. The national dispatch center, ONS – National System Operator – argues that dispatching information is strategic to the power agents and therefore cannot be made available. On the other hand, ANEEL, the electricity agency, provides information on power capacity and other legal matters on the electricity industry, but no dispatch information can be got through this entity.

In that regard, project proponents looked for a plausible solution in order to be able to calculate the emission factor in Brazil in the most accurate way. Since real dispatch data is necessary after all, the

[17] Bosi,M. *An initial View on Methodologies for Emission Baselines: Electricity Generation Case Study.* International Energy Agency. Paris, 2000.

ONS, was specifically contacted and the reason for data collection was explained. After several months of talks, plants's daily dispatch information was made available by ONS.

The aggregated hourly dispatch data supplied from ONS was used to determine the lambda factor for each of the years with available data (2005,2006 and 2007). The low-cost/must-run generation was determined as the total generation minus generation from fossil-fuelled thermal plants generation. All this information were provided to the validators.

A summary of this analysis were provided on the item B.6.3 and the load duration curves for the S-SE-CO subsystem are presented below:

Figure 1: Load Duration Curve for the S-SE-CO Subsystem, 2005

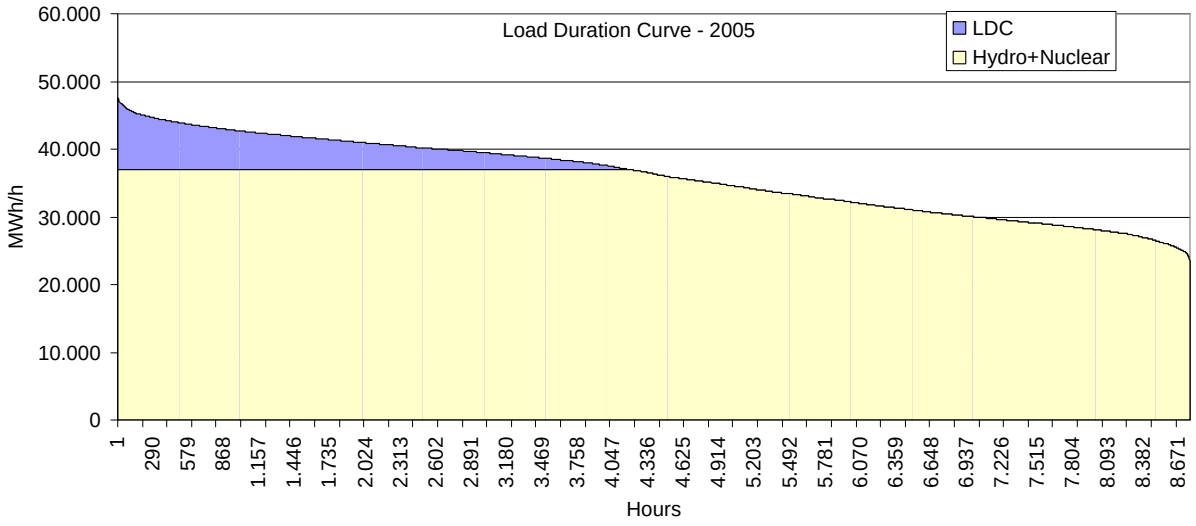


Figure 2: Load Duration Curve for the S-SE-CO Subsystem, 2006

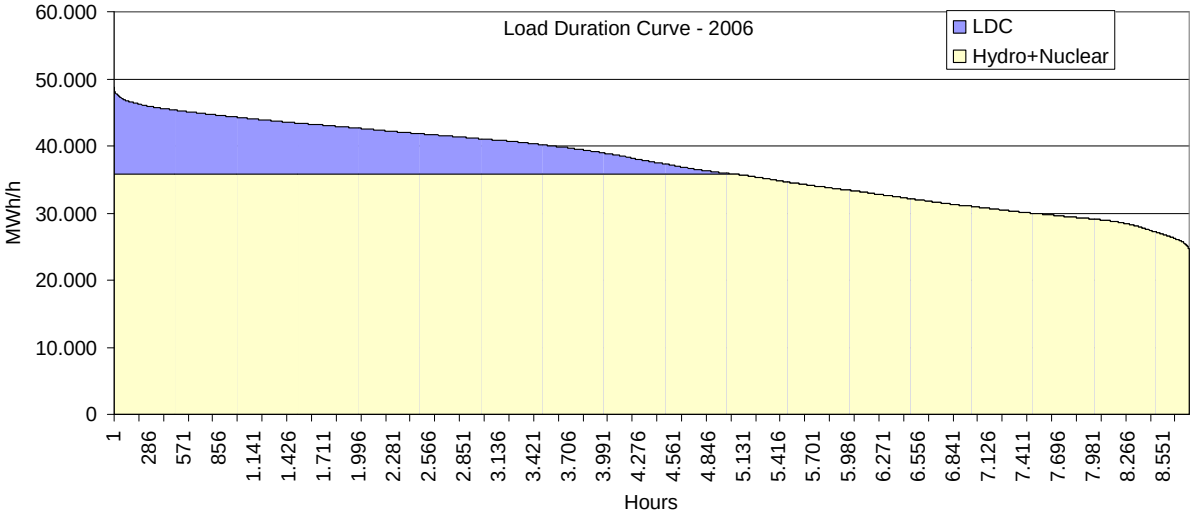
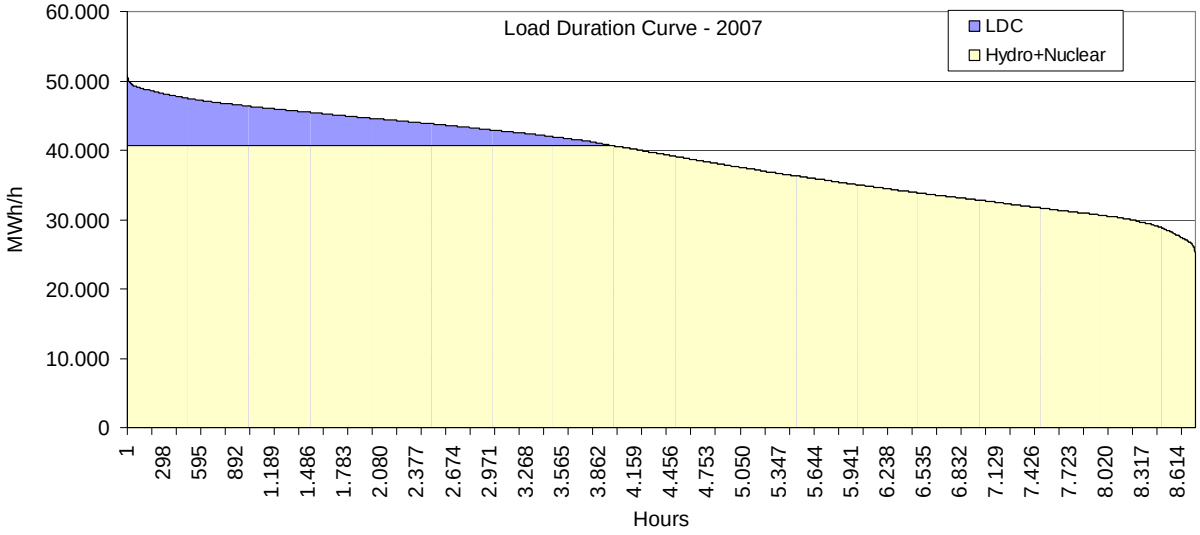


Figure 3: Load Duration Curve for the S-SE-CO Subsystem, 2007



Others information about the baseline scenario and baseline emissions are presented on item B.

Annex 4

MONITORING INFORMATION

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

All procedures which will be used to monitor the project are described on item B.7.1 and B.7.2. Some additional information is presented below.

Some details about the CCEE Energy Measurement Process are described below:

The Commercialization Process

The Electric Power Commercialization Process takes place in accordance to the parameters that have been established by Law 10848/2004, by Decrees 5163/2004 and 5.177/2004 (which instituted 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. Such 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 valued according to the PLD (Price for the Settlement of Differences, from Portuguese: Preço de Liquidação das Diferenças), set weekly for each load level, and for each Subsystem, having as basis the marginal cost to operate the system, which is limited by a minimum and by a maximum price.

Measurement

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

Accounting Measurement

The National Interconnected System is represented at the CCEE through a structure made-up of the measurement of consumption and generation points, which are defined through the Electric System Modeling, and whose purpose is 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 such 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 Measurement

Aggregation (from Portuguese: 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 measurement 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 measurements taken at different actual points of the SIN.

The points of the SIN that become part of the apportionment process mentioned 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 from the measurement 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 (from Portuguese: Sistema de Coleta de Dados de Energia Elétrica) is responsible for the daily collection and treatment of measurement 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 measurement 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 temporarily by ANEEL'S Authoritative Resolution no. 787, of 23/01/2007.

To establish the periodicity which the Monjolinho Project's measuring tools should be calibrated, it follows below the orientation presented in Grid Procedures Sub-Module 12.3, established by ONS.

Preventive maintenance – Meters Calibration

Source: 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 devices.

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

Annex 1 of ONS Sub-Module 12.3

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 2 (two) years at the most. That periodicity can be altered in function of the occurrence report observed for all facilities.

(b) The preventive maintenance can be postponed by the period of up to 2 (two) years, in case an inspection happens in the measurement point. The postponement of that maintenance starts to be applied from the inspection date.

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

(d) In all maintenance or meters calibration, these should be substituted by another properly programmed and calibrated, when there is not an extra device, in order to minimize the interruption in the registration's load

(e) Any changing in the relation of TI's transformation 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 data registered change in the Electric Power Data Collection System - SCDE and submit it to the approval of the CCEE. After the alterations in the measurement system, the involved agents should program an inspection to restore the sealing waxes.

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

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

(h) The meter's calibration 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 should be equal to the meter's nominal tension.

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

(k) The standards, the artificial load and the meter must, when necessary, 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' meters orientations and pattern - for the thermal stabilization.

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

(m) The meter in calibration that presents 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 currents phasorial, the tensions and the sequence's phase's studies should be accomplished before and after the maintenance.

(p) In case the connected agent's or responsible agent for SMF is 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.