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

CONTENTS

Annexes

Revision history of this document

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

SECTION A. General description of small-scale project activity

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

Faxinal II Small Hydroelectric Power Plant – hereafter referred to as "FAXSHP II".

Version 01
04 May 2007

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

The FAXSHP II project consists in the implementation of Small Hydroelectric Power Plant in the Aripuanã river. The river is located in the Aripuanã Main Region at Mato Grosso State, Midwest Region of Brazil. The FAXSHP II is located in an isolated region, more than 1,000 Km away from the State's capital Cuiabá, and is not connected to any of the Brazilian Interconnected Systems. Nowadays the business as usual alternative for energy generation in that region is thermo power plants.

The main objective of the project is to help meet Brazil's rising demand for energy due to economic growth and to contribute to the environmental, social and economic sustainability by increasing renewable energy's share of the total Brazilian electricity consumption.

FAXSHP II uses the renewable hydro potential of the Aripuanã River to supply electricity to the Aripuanã Municipality and region. In 2002 (most recent data available) the energy joint enterprise that covers the project activity's area REDE - *Centrais Elétricas Matogrossesses S.A.* (REDE-CEMAT), consumed 866,890 litters of diesel in its thermoelectric plants to supply energy to the Aripuanã Municipality, and about 14,376,000 litters of diesel to supply energy to Aripuanã Main Region (www.seplan.mt.gov.br/anuario2004/13.10.htm), contributing to elevate the greenhouse gas (GHG) emission factor of Brazil's energy scenario. The project activity will reduce these emissions by displacing electricity generation through fossil fuel combustion (and CO_2 emissions).

FAXSHP II improves the supply of electricity with clean, renewable hydroelectric power while contributing to the regional/local sustainable economic development. The implementation of the project will result in an increase of energy supply in an opportune period, enabling the maintenance of the growing rate of Midwest Region of the order of 5,2% a year and reducing the risk of energy deficit. The demand for energy in Aripuanã and others Municipalities of the region was 86,000 MWh in 2003 (www.seplan.mt.gov.br/anuario2004/13.4.htm) and has been growing continually ever since due to the region's development. Without SHP projects such as FAXSHP II the only alternative to attend that increasing energy demand in the short term will be the continuous use of thermo power.

Besides, the project will be an example of a low environment impact alternative to large hydropower plants in a region that concentrates the lasts remnants of Amazonian Forest of the State, with a high rate of endemic species and that presents an amazing scenic beauty and great value for the tourism industry.

Small-scale hydropower run-of-river plants such as FAXSHP II provide local and clean distributed generation, in contrast with the business as usual large hydropower and natural gas or diesel fired plants built in the last 5 years, and these small-scale projects provide site-specific reliability and transmission and distribution benefits including:

• Increased reliability and shorter and less extensive outages;
• Lower reserve margin requirements;
• Improved power quality;
• Reduced lines losses;
• Reactive power control;
• Mitigation of transmission and distribution congestion; and
• Increased system capacity with reduced T&D investment.

A strong indication that FAXSHP II contributes to the country's sustainable development goals is that the project is in accordance with the April 2002 law # 10,438 of Proinfa (*Programa de Incentivo as Fontes Alternativas de Energia Elétrica*). Proinfa is a Brazilian federal program that gives incentive to alternative sources of electricity (wind energy, biomass cogeneration, and a small scale hydropower plant). Among other factors, this initiative's goal is to increase the renewable energy source share in the Brazilian electricity matrix in order to contribute to a greater environmental sustainability through giving these renewable energy sources better economic advantages. The Brazilian government has committed a large monetary found in order to develop this plan. Although FAXSHP II is eligible for Proinfa, it has not applied for financing under Proinfa and therefore does not have access the advantages of the program.

A.3. Project participants:

Name of the 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	Centrais Hidrelétricas Salto dos Dardanelos S/A	No
United Kingdom (see notes (1) and (2))	MGM Carbon Portfolio, S.a.r.l (private)	No

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

Notes

(1) Although MGM CP is not established in United Kingdom, the Annex I LoA (letter of approval) will be requested in UK, and then UK will be the host country.

(2) For Hydroelectric projects which capacity are higher than 20 MW, MGM CP will request Annex I approval in Netherland.

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

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

A.4.1.1. Host Party(ies):

Brazil.

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

Mato Grosso State (Midwest Region of Brazil).

A.4.1.3. City/Town/Community etc:

Aripuanã Municipality.

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

FAXSHP II is located in the Aripuanã river in the Municipality of Aripuanã, about 1,066 Km northwest of Cuiabá, the capital of Mato Grosso State (Figures 1 and 2) and 530 Km east of Porto Velho, capital of Rondonia State. The Aripuanã river is tributary of the Madeira River, located in the Amazon river's water-basin and the coordinates are 10°09'44" South, 59°27'28" West.

The Brazilian South/Southwest/Midwest Interconnected System, the closest to the project area, is more than 230 Km away from FAXSHP II (Figure 3). The remote location of the project area and the biogeography characteristics of the surroundings, with dense tropical forest and rough geography, difficult the connection of the area to the Interconnected Power Systems of Brazil.

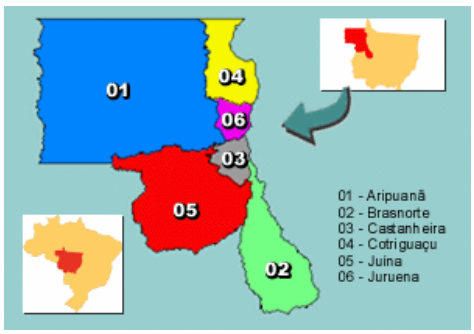

Figure 1. Location of Aripuanã Main Region and Aripuanã Municipality (number 01).

Figure 2. Aripuanã River and FAXSHPII's implementation site.

Figure 3. Brazilian Interconnected Power Systems and location of the Aripuanã Main Region.

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

According to the list of the small-scale CDM project activity categories contained in Appendix B of the Simplified M&P for the Small-Scale CDM Project Activities, the FAXSHP II project corresponds to:

Type I: Renewable Energy Projects
Category D: Electricity Generation for a System

The FAXSHP II, with a power loading of 10 MW (below the eligibility limit of 15MW for Small Scale Project), is introduced in the regional context as a low impact plant whose dam is designed to operate as run of river and utilizes the renewable hydro potential of the Aripuanã river to supply electricity to the Aripuanã Municipality and region that is supplied by fossil fuel fired generating units.

Run-of-River schemes do not include significant water storage, and must therefore make complete use of the water flow. A typical run-of-river scheme involves a low-level diversion dam and is usually located on swift flowing streams. According to Eletrobrás (1999), run-of-river projects are defined as "the projects where the river's dry season flow rate is the same or higher than the minimum required for the turbines". A low-level diversion dam raises the water level in the river sufficiently to enable an intake structure to be located on the side of the river. The intake consists of a trash screen and a submerged opening with an intake gate. Water from the intake is normally taken through a pipe (called a penstock) downhill to a power station, constructed downstream of the intake and at as low level as possible to gain the maximum head on the turbine.

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

The Generation System comprises 02 identical Generation Systems, as specified bellow:

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Turbines: HISA

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Generator: WEG
Active Power: 5,000 KW

Automation System: SEME / FLESSAK

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

Table 2. Estimated emission reductions through the crediting period.

Excluído: first 7-year

Years	Estimation of annual emission reductions in tonnes of CO_2e
2008	52,560
2009	52,560
2010	52,560
2011	52,560
2012	52,560
2013	52,560
2014	52,560
2015	52,560
2016	52,560
2017	52,560

Total estimated reductions (t CO_2e)	525,600
Total number of crediting years	10
Annual average of the estimated reductions over the crediting period (t CO_2e)	**52,560**

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

No public funding has been involved in financing this project activity.

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

In accordance with Appendix C of the Simplified M&P for the Small-Scale CDM Project Activities, the FAXSHP II project is not a debundled component of a larger CDM project activity.

The project activity is an independent hydro power plant generating electricity, unrelated to any other CDM project activity in the region, existing or planned. The project proponent has not another registered small-scale CDM project activity, or an application to register another small-scale CDM project activity:

- in the same project category;
- registered within the previous 2 years; or
- whose project boundary is within 1 km of the project boundary of the proposed small-scale activity at the closest point.

SECTION B. Application of a baseline and monitoring methodology

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

As mentioned above, according to the list of the small-scale CDM project activity categories contained in Appendix B of the Simplified M&P for the Small-Scale CDM Project Activities, the FAXSHP II project corresponds to:

Type I: Renewable Energy Projects
Category D: Electricity Generation for a System

Thus, the methodology used in this project activity is AMS-I.D, version 11: Grid Connected Renewable Electricity Generation (Version 10).

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

The FAXSHP II qualifies under this project category since:

- The project activity is a run of river hydroelectric power plant.
- The project activity supplies electricity to the Aripuanã Municipality and surroundings.

This project replaces existing fossil fuel fired generation plants in the Aripuanã Municipality by constructing a small hydropower station (categorized under renewable energy), with a power loading of 10 MW, which is lower than 15 MW, and thus, the project activity qualifies as a small-scale project activity and will remain under the limits of small-scale project activity types during every year of the crediting period.

B.3. Description of the project boundary:

The AMS ID version 11, states:
The project boundary encompasses the physical, geographical site of the hydropower generation source.

According to this definition, the project boundary is set to 'the generating unit' such as the main building of the FAXSHP II station, which is represented by the Aripuanã River basin close to the power plant facility and the Aripuanã Municipality grid.

B.4. Description of baseline and its development:

According to the selected methodology "the baseline is the annual kWh generated by the renewable unit times an emission coefficient for a modern diesel generating unit of the relevant capacity operating at optimal load".
The baseline scenario that reasonably represents the anthropogenic GHG emissions that would occur in the absence of this project activity is the continuum of diesel power generation thru the CEMAT's thermoelectric plants. Electrification by the diesel power generation is a method generally used by remote electrification systems and is cited as an appropriate method in the "Appendix B of the simplified modalities and procedures for small-scale CDM project activities".
The amount of GHGs emissions from the diesel power generation are calculated using a default value of 0.8 $KgCO_2e/kWh$, coefficients from diesel power generation units (according to Table I.D.1. of the methodology AMS-I.D., version 11).

With the total provision of renewable hydroelectric energy to the region by FAXSHP II, is expected that there will be no interest in the installation of power lines thru that distance for a period lesser than 10 years.

Since this new built run-of-river small hydropower generation does not emit GHGs in operating and will displace the generation of the same quantity of energy by diesel combustion, it can be assumed that without this project the GHGs emissions will be higher.

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

In accordance with Attachment A of Appendix B of the Simplified M&P for the Small-Scale CDM Project Activities, a barrier analysis could be carried out in order to demonstrate project additionally, as described bellow (30 September 2005 edition):

> "*Project participants shall provide an explanation to show that the project activity would not have occurred anyway due to at least one of the following barriers:*
>
> *(a) Investment barrier: a financially more viable alternative to the project activity would have led to higher emissions;*
>
> *(b) Technological barrier: a less technologically advanced alternative to the project activity involves lower risks due to the performance uncertainty or low market share of the new technology adopted for the project activity and so would have led to higher emissions;*
>
> *(c) Barrier due to prevailing practice: prevailing practice or existing regulatory or policy requirements would have led to implementation of a technology with higher emissions;*
>
> *(d) Other barriers: without the project activity, for another specific reason identified by the project participant, such as institutional barriers or limited information, managerial resources, organizational capacity, financial resources, or capacity to absorb new technologies, emissions would have been higher."*

The project activity has been initiated in November 25th, 2002, as stated in the Resolution nº 637 of November 22th, 2002, issued by ANEEL, which authorizes to Centrais Elétricas Salto dos Dardanelos Ltda. to be established as an Independent Power Producer[1]. However, the FAXSHP II started supplying electricity (partial load), on november 2005.

To substantiate the barrier analysis, a brief overview of the Brazilian electricity market in the last years is presented:

Until the beginning of the 1990's, the energy sector was composed almost exclusively of state-owed companies. From 1995 on, due the increase in international interest rates and the lack of investment capacity of the State, the government was forced to look for alternatives. The recommended solution was to initiate a privatisation process and the deregulation of the market.

The four pillars of the privatisation process initiated in 1995 were:

- Building a competitive friendly environment, with the gradual elimination of the captive consumer. The option to choose an electricity service supplier began in 1998 for the largest consumers, and should be available to the entire market by 2006;

[1] See the resolution in the following link: http://www.aneel.gov.br/cedoc/res2002637.pdf

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- § Dismantling of the state monopolies, separating and privatising the activities of generation, transmission and distribution;
- § Allowing free access to the transmission lines, and
- § Placing the operation and planning responsibilities to the private sector.

At that time, three entities were created, the Brazilian Electricity Regulatory Agency (*Agência Nacional de Energia Elétrica*, ANEEL) set up to develop the legislation and to regulate the market; the National Power System Operator (*Operador Nacional do Sistema Elétrico*, ONS) to supervise and control the generation, transmission, and operation; and the Wholesale Energy Market (*Mercado Atacadista de Energia Elétrica*, MAE) to define rules and commercial procedures of the short-term market.

At the end of 2000, after five years of the privatisation process, results were modest. Despite high expectations, investments in new generation did not follow the increase in consumption.

The decoupling of GDP (average of 2% increase in the period of 1980 to 2000) from electricity consumption increase (average of 5% increase in the same period) is well known in the developing countries, mainly due to the broadening of supply services to new areas and the growing infra-structure. The necessary measures to prevent bottlenecks in service were taken. These include an increase of generation capacity higher than the GDP grow rate and strong investments in energy efficiency. In the Brazilian case, the increase in installed generation capacity (average of 4% in the same period) did not follow the growth of consumption (Figure 4).

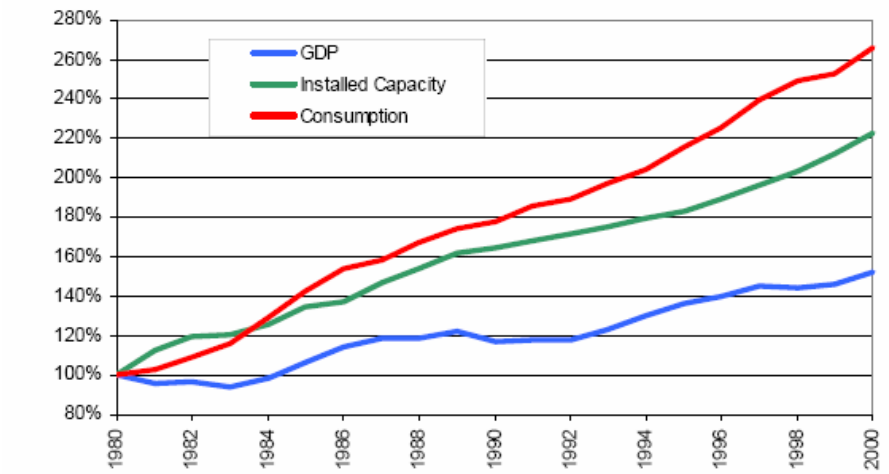

Figure 4: Cumulative variation of GDP, electricity supply (installed capacity), and demand (consumption)[2]

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Without new installed capacity, the only alternatives were energy efficiency improvements or higher capacity utilization (capacity factor). Regarding energy efficiency, the government established in 1985 a program named PROCEL (National Electricity Conservation Program). Although the objectives of the

[2] Source: Eletrobrás (http://www.eletrobras.gov.br/) and IBGE (http://www.ibge.gov.br/)

program were commendable the results were limited, mainly due to insufficient investment and poorly managed strategies.

The remaining alternative, to increase the capacity factor of the old plants was the most widely used. To understand if such increase in capacity factor brought positive or negative consequences, it is necessary to analyze the availability and price of fuel. In the Brazilian electricity system, the primary energy source is water accumulated in reservoirs. Such reserve, which were planned to withstand 3 years of less-than-average rainy seasons, almost collapsed after single season of low rainfall (2000/2001 experienced 74% of historical regional average rainfall). This situation depicts a very intensive use of the country's hydro resources to support the increase in demand without enough increase of the installed capacity. Under the situation described, there was no short-term solution for the problems that finally caused shortage and rationing in 2001.

Aware of the difficulties since the end of the 1990's, the Brazilian government signalized that it was strategically important for the country to increase thermoelectric generation and consequently be less dependent of hydropower. With that in mind, the federal government launched in the beginning of the year 2000 the Thermoelectric Priority Plan (*Plano Prioritário de Termelétricas*, PPT)[3] originally planning the construction of 47 thermo plants using mainly natural gas imported from Bolivia, totaling 17,500 MW of new installed capacity by December 2003. During 2001 and the beginning of 2002, the plan was reduced to 40 plants and 13,637 MW to be installed by December 2004[4]. Until December 2004, 20 plants totaling around 9,700 MW were operational.

It is clear that hydroelectricity is and will continue to be the main source for electricity base load in Brazil. However, most, if not all-medium and large hydro resources in South and Southeast of the country have been exploited, and most of the remaining reserves are located in the Amazon basin, far from the industrial population center[5]

Investment Barrier (Long-term funding)

The high level of guarantees required to finance an energy project in Brazil is a barrier for developing new projects. Insurance, financial guarantees, financial advisories are requirements that increase the cost of the project and are barriers to the project finance ability. Also, the project is generally not financed on a project finance basis, and then the developer is exposed to an extra financing risk.

Other financial barriers may be related to the power purchase agreement (PPA). The PPA is required in order to obtain long-term financing from a bank and the lack of adequate commercial agreements from the energy buyers may influence directly the negotiation between the bank and the project developer. Most of the utilities in Brazil do not have a satisfactory credit risk, thus representing a barrier to obtain long-term funding.

As a consequence of the long period of inflation, the Brazilian currency experienced high volatility coupled with strong devaluation, effectively precluding commercial banks from providing any long-term debt

[3] Federal Decree 3,371 of February 24th, 2000, and Ministry of Mines and Energy Directive 43 of February 25th, 2000

[4] Federal Law 10,438 of April 26th, 2002, Article 29

[5] Source: OECD, 2001

financing to local companies. The lack of a long-term debt market caused a severe negative impact on the financing of energy projects in Brazil.

Interest rates for local currency financing are significantly higher than US Dollar rates. The National Development Bank (BNDES) is the only supplier of long-term loans, but it requires excessive guarantees in order to provide financing. Debt financing from BNDES are made primarily through commercial banks. The credit market is dominated by shorter maturities (90-days to 01-year) and long-term credit lines are available only to the strongest corporate borrowers and for special government initiatives. Credit is restricted to the short-term in Brazil or the long-term in dollars offshore.

Financial domestic markets with maturity of one year or greater practically do not exist in Brazil. Experience has shown that in moments of financial stress the duration of savings instruments contracted drops to levels close to one day with a massive concentration in overnight banking deposits. Savers do not hold long-term financial contracts due to the inability to price-in the uncertainty involved in the preservation of purchasing power value[6].

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

On the other hand, there's no lack of long term funding for large hydro and thermo power plants and the federal government support these kinds of power plants, therefore, the identified barrier do not prevent the implementation of the alternatives.

Institutional Barrier

Since 1995 government electricity market policies have been continuously changing in Brazil. Too many laws and regulations were created with the aim of providing incentives for new investments in the energy sector. The results of such regulatory instability were the contrary to what was trying to be achieved. During the rationing period electricity prices surpassed 600 R$/MWh (around 200 US$/MWh) and the forecasted marginal price of the new energy reached levels of 120/150 R$/MWh (around 45 US$/MWh). In the middle of 2004 the average price was bellow 50 R$/MWh (less than 20 US$/MWh). This relatively high volatility of the electricity price in Brazil, although in the short term, contributes to difficult the analysis of the market by the developers.

Prevailing Business Practice

The prevailing business practice in Brazil as far as obtaining financing and financial guarantees to project is a barrier to investment in renewable energy projects in the country. Given the various programs and incentives, which were considered along the last years, but never successfully implemented, it is easy to notice the difficulty and barriers to implement small hydro projects in the country. An indication of this barrier is exemplified by the Program called PCH-COM, structured by the end of 2000 and beginning of 2001. In 2001, Eletrobrás, in partnership with BNDES, launched the PCH-COM program, which had as

[6] Source: Arida et al., 2004

its main goal to support and encourage the construction of small hydropower plants. This program consisted in the financing of the project by BNDES and the commercialization of the power by Eletrobrás. The operation of the program consisted on the analysis of the project by both BNDES and Eletrobrás. In case the project was approved, there would have been two contracts to be signed: the financing one with BNDES and the Power Purchase Agreement (PPA) with Eletrobrás. The program was not successful because of the guarantees needed and the clauses of the contracts (i.e., the project was not considered as a project finance basis and the lender demanded for direct guarantees from the developer, other than the project itself). After that, the government created, in 2002, the PROINFA program, which foresees raising the share of renewable energy power generation by adding 3,300 MW installed capacity of small-hydro power plants, wind-power, and biomass, offering long-term contracts with special conditions, lower transmission costs, and smaller interest rates from the local development banks. In 2005, the BNDES presented the last final version of its financing incentive line to PROINFA, which is different from the one first considered for the program that was not considered sufficient.

Although some projects started construction independently from Proinfa, the program is considered one of the more viable financing alternatives for these projects, which will provide long-term PPAs (power purchase agreement) and special financing conditions. FAXSHP II is not participating in the program and is addressing the market risk as it structures its projects.

Common practice in Brazil has been the construction of large-scale hydroelectric plants and, more recently, of thermal fossil fuel plants, with natural gas, which also receive incentives from the government.

Already, 21.3% of the power generated in the country comes from thermal power plants, and this number tends to increase in the short term, since 41% of the projects approved between 1998 and 2005 are thermal power plants (compared to only 14% of small hydropower plants)[7].

These numbers show that incentives for the construction of thermal power plants have been more effective than those for small hydropower plants.

Therefore, it is clear that the identified barriers do not prevent the continuation of the current trend of the Brazilian interconnected grid.

The recent nationalization of the natural gas industry by the Bolivian government might change this situation, but perspectives are not clear so far. In the most recent energy auction, which took place on December 16th, 2005, in Rio de Janeiro, 20 concessions for new power plants were granted, of which only two are for small hydropower plants (28 MW). From the total of 3,286 MW sold, 2,247 MW (68%) will come from thermal power plants, from which 1,391 MW come from natural gas fired thermal power plants, i.e., 42% of the total sold[8].

In summary, FAXSHP II cannot be considered common practice and therefore is not a business as usual type scenario.

Conclusions

[7] Source: http://www.aneel.gov.br/area.cfm?idArea=15 (Capacidade Geração Brasil)
[8] Source: Rosa, Luis Pinguelli. Brazilian. Newspaper “Folha de São Paulo”, December 28, 2005.

As defined by ANEEL[9], small hydro power plants are power plants with installed capacity greater than 1 MW and up to 30 MW, and with reservoir area lower than 3 km². Generally, it consists of a run-of-the-river hydro plant, which has a minimum environmental impact. This is not the business-as-usual scenario in a country where large hydro and thermal fossil fuel projects are preferable. With the financial benefit derived from the CERs, it is anticipated that other project developers would benefit from this new source of revenues and would then decide to develop such projects. An increase of approximately 100 to 200 basis points, derived from CERs, would be an important factor in determination to start such project. Thus, the proposed project activity results to be additional.

CDM has made it possible for some investors to set up small hydro plants and sell electricity to the grid. The registration of the proposed project activity will have a strong impact in paving the way for similar projects to be implemented in Brazil.

B.6. Emission reductions:

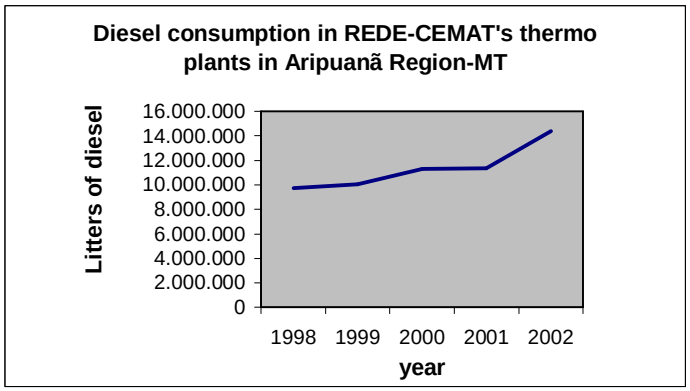
B.6.1. Explanation of methodological choices:

According to the project category and the corresponding methodology, project emissions are zero and leakage is to be considered only when the energy generating equipment is transferred from another activity. This is not the case of FAXSHP II. The energy conversion equipment for the project was manufactured new for specific site conditions. Therefore, there is no leakage associated to the project activity

The baseline scenario that reasonably represents the anthropogenic GHG emissions that would occur in the absence of the project activity is the continuum of the diesel power generation scenario, which is cited as reasonable in the "Appendix B of the simplified modalities and procedures for small-scale CDM project activities." In this project, the emission reductions are achieved by replacing an existing technology (diesel fired thermoelectric power plant).

The graphic below is based on most recent data provided by Mato Grosso State's Planning and General Control Secretariat – SEPLAN. It shows the increase in diesel consumption by REDE-CEMAT's thermoelectric plants, located in Aripuanã Main Region, between 1998 and 2002. REDE is the main energy producer in Mato Grosso State and CEMAT is REDE's local energy concessionary.

[9] Resolution n. 394, December 4th, 1998.



The graphic's curve illustrates an average annual increase of 10.75% in fuel consumption in Aripuanã Main Region. Considering that the project activities area is experimenting a high development rate in the lasts years, it is reasonable to assume an increase trend in fuel consumption rates for the next years.

Nevertheless the table below also provided by SEPLAN and with data from REDE-CEMAT plants, shows a small reduction in thermo power production from 2002 to 2003 in Aripuanã Main Region. However, in 2003 the thermo generation still represented 57.8% of all energy produced in the area and, even if that reduction continues, is reasonable to project a continuum high portion of thermoelectric generation in the region..

Table 3. Effective thermic energy installed capacity (kW) in Mato Grosso State from REDE-CEMAT System /1998-2003.

Code	Municipality	1998	1999	2000	2001	2002	2003
Mato Grosso State		55500	64000	72115	82000	87770	87375
1. North State		39530	44830	50485	58325	66405	65780
1.1 Aripuanã Region		9870	12065	14410	22050	27705	26155
1.1.1	Aripuanã				2000	3500	3500
1.1.2	Brasnorte	1490	2000	2500	3500	3500	
1.1.3	Castanheira	980	750	1250			
1.1.4	Colniza		330	830	1500	2700	4425
1.1.5	Cotriguaçu	1140	805	1150	1375	1375	1625
1.1.6	Juína	5050	7000	7000	11500	12400	12375
1.1.7	Juruena	1210	1180	1680	1725	3725	3725
1.1.8	Rondolância				450	505	505

Source: www.seplan.mt.gov.br/anuario2004/13.2.htm

Since the run-of-river small hydropower generation emits no GHGs, all GHGs emitted from the diesel power generation replaced by this project can be considered to be reduced. As suggested in the methodology, a default value from diesel generation units, or 0.8 $KgCO_2e/kWh$ (Table I.D.1), is used for the calculation of baseline emission.

According to what is presented above, the formula used to calculate the emission reductions achieved by the FAXSHP II project is:

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$$ER_y = EG_y * EF$$

Where:

$\mathbf{ER_y}$ = Emission reductions achieved in year *y* (tCO_2e);
$\mathbf{EG_y}$ = Electricity generated by the proposed project activity during the year *y* (MWh);
EF = Emission factor from diesel generation units (0.8 tCO_2e/MWh).

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

Table 4. Data available at validation.

Data / Parameter:	***EF***
Data unit:	tCO_2e/MWh
Description:	Carbon dioxide emission factor from diesel generation units.
Source of data used:	2006, UNFCCC. Methodology: AMS I.D.: Grid Connected Renewable Electricity Generation (Version 11).
Value applied:	0.8
Justification of the choice of data or description of measurement methods and procedures actually applied :	According to the methodology, an emission coefficient for a modern diesel generating unit of the relevant capacity operating at optimal load must be used as given in Table I.D.1.
Any comment:	This is used to determine the emission reductions.

Data / Parameter:	***Plant capacity***
Data unit:	MW
Description:	Energy generation capacity of the SHP in year *y*
Source of data used:	Project proponents
Value applied:	10
Justification of the choice of data or description of measurement methods	

and procedures actually applied :	
Any comment:	This is used to determine the energy generation in year *y*.

Data / Parameter:	***Capacity factor***
Data unit:	fraction
Description:	Capacity factor of the SHP in year *y*
Source of data used:	This value is the mean capacity factor for SHPs.
Value applied:	0.75
Justification of the choice of data or description of measurement methods and procedures actually applied :	
Any comment:	This is used to determine the energy generation in year *y*.

B.6.3 Ex-ante calculation of emission reductions:

As mentioned above, since project emissions and leakage emissions are zero, emission reductions are the same as baseline emissions, as follows:

$$ER_y = EG_y * EF$$

Where:
$\mathbf{EG_y}$ = Electricity generated by FAXSHP II during the year *y* (MWh);
EF = Emission factor from diesel generation units (0.8 tCO_2e/MWh).

The expected annual renewable energy produced by FAXSHP II and the emission reductions are shown in the following table:

Table 5. Expected annual electricity generation and emission reductions.

Plant capacity **(A)**	10 MW
Annual hours **(B)**	8,760 h/year
Capacity factor **(C)**	0.75
Electricity generation	**65,700 MWh/year**

(A) x (B) x (C)	
Emission Reduction	**52,560 tCO_2e/year**

Thus, the amount of the renewable energy generation of FAXSHP II is estimated in 65,700 MWh/year and the mean annual emission reduction results to be 52,560 tCO_2e/year.

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

Table 6. *Ex-ante* estimation of emission reductions during the crediting period (tCO_2e).

Year	Estimation of project activity emissions (tCO_2e)	Estimation of baseline emissions (tCO_2e)	Estimation of Leakage (tCO_2e)	Estimation of Overall reductions (tCO_2e)
2008	0	52,560	0	52,560
2009	0	52,560	0	52,560
2010	0	52,560	0	52,560
2011	0	52,560	0	52,560
2012	0	52,560	0	52,560
2013	0	52,560	0	52,560
2014	0	52,560	0	52,560
2015	0	52,560	0	52,560
2016	0	52,560	0	52,560
2017	0	52,560	0	52,560
Total (tonnes of tCO_2e)	**0**	525,600	**0**	525,600

Excluído: first 7-year
Excluído: 2007
Excluído: 2008
Excluído: 2009
Excluído: 2010
Excluído: 2011
Excluído: 2012
Excluído: 2013
Excluído: 367,920
Excluído: 367,920

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

B.7.1 Data and parameters monitored:

Table 7. Data to be monitored.

Data / Parameter:	EG_y
Data unit:	MWh
Description:	Electricity generated by the renewable technology in the year *y*

Source of data to be used:	Centrais Hidrelétricas Salto dos Dardanelos S/A
Value of data	65,700
Description of measurement methods and procedures to be applied:	In collecting data of the electricity produced for the monitoring at the power station, using watt-hour-meters is the most appropriate method to meet the requirement of accuracy, comparability, completeness, and validity. This data will be measured each 15 minutes and recorded monthly.
QA/QC procedures to be applied:	The uncertainty level of the data is low, and the equipment will be regularly calibrated.
Any comment:	This data will be used to calculate the emission reductions obtained through the project activity. Data will be archived electronically until two years after finishing the crediting period.

B.7.2 Description of the monitoring plan:

According to the methodology AMS I.D., version 11 , monitoring shall consist of metering the electricity generated by the renewable technology. This Monitoring Plan applies to electricity capacity additions from small-scale run-of-river hydro power plants.

Since this project is a run-of-river small hydropower generation, there occur no emissions of greenhouse gases through its operation.

For the monitoring, the data of total amount of power produced by the plant as gross power output will be monitored. Since the amount of the electric power that is used for the generation equipment, power supply for the gauge, is negligible (less than 1%), it is sufficient to collect data of gross output.

FAXSHP II will assign a qualified person to compile the necessary data according to the approved methodology to accurately calculate emission reductions. The data will be compiled in a manner amenable to third party audit and deliverable to the DOE for validation and certification purposes.

Since there are no leakage sources identified in the project, no control over leakage is necessary.

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

Date of completion: 01/12/2005 (revised on 09/03/2007)

Name of the responsible person/entity:

- Osvaldo Stella Martins PhD
- João M. Franco, MGM International SRL

Av. Luis Carlos Berrini , 1297 cj 121
CEP 04571-010, São Paulo - Brazil
Tel. (55 11) 5102 3844

Osvaldo Stella Martins and João M. Franco are not project participants.

SECTION C. Duration of the project activity / crediting period

C.1 Duration of the project activity:

Formatado

C.1.1. Starting date of the project activity:

01/11/2005

Formatado: Não Realce

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

25 years – 0 months.

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

Fixed crediting period.

Excluído: Renewable

C.2.1. Renewable crediting period

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

N/A

Excluído: 01/01/2008¶

C.2.1.2. Length of the first crediting period:

N/A

Excluído: 7 years – 0 months

C.2.2. Fixed crediting period:

C.2.2.1. Starting date:

01/01/2008

Formatado: Não Realce

Excluído: N/A¶

C.2.2.2. Length:

10 years

Excluído: N/A

Excluído: .

Formatado: Não Realce

SECTION D. Environmental impacts

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

The proponent of any project that involves the construction, installation, expansion, and operation of any polluting or potentially polluting activity or any activity capable of causing environmental degradation is required to secure a series of permits from the respective state environmental agency.

Three types of licenses are required:

1- Preliminary Permit (*Licença Prévia* or L.P.) issued during the planning phase of the project and which contains basic requirements to be complied with during the construction, and operating stages;

2- Construction Permit (*Licença de Instalação* or L.I.);

3- Operating Permit (*Licenca de Operação* or L.O.).

Depending of the preliminary studies required for the issue of the L.P., the preparation of an additional Environmental Assessment Report is required prior to obtaining construction and operation permits.

According to the preliminary studies carried out in the project implementation area, the possible negative environmental impacts regarding the construction and operation of the FAXSHP II, are low and therefore the Environmental Assessment Report was not required by the competent environment agency State (Environmental Secretariat - SEMA).

SEMA issued all the required licenses to Centrais Hidrelétricas Saldo dos Dardanelos S/A:

L.I. Nº 498/4004 isuued on 25/11/2004
L.O Nº 1890/2005 issued on 09/11/2005
allowing the construction and operation of FAXSHP II.
Since the operation license expires in 01 year, this licensing is renovated each year

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:

As mentioned above, the possibility of negative environmental impacts regarding the construction and operation of the FAXSHP II are low, according to the preliminary studies carried out in the project implementation area.

SECTION E. Stakeholders' comments

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

Researches made with the local community demonstrated no opposition to the construction of the plant. This information was considerate in the decision to continue with the project, mainly by the fact that the displacement of households generates expectation of unquietness as well as voluptuous investment demands, making plants with low installation capacity not feasible.

The Resolution number 1, issued by Brazilian DNA, established that the consultation must be performed by the project sponsor at least with the following entities:

- Municipality and Alderman Chamber
- State and Municipal Environmental Agencies
- Brazilian Forum of NGOs
- Community Associations
- Public Ministry

The invitation letters were sent to the stakeholders listed above, during June 2007. The copies of the letters and the acknowledgement of receipt (called AR in Brazil) will be shown to the DOE during the validation process.

Excluído: May

Formatado: Não Realce

With the purpose to facilitate the comments of the invited persons, the following questionnaire was sent to the stakeholders:

1. Do you believe that the socio-economic situation of the region will improve due to the implementation of the project?
2. Is the implementation of project able to improve the environmental situation in the region?
3. How does the development of the project affect you (positively or negatively) or your environment?
4. Would you recommend private companies or authorities to develop projects of this nature?
5. Do you think the project will contribute to the Brazilian Sustainable Development?
6. Any additional comments you would like to make.

The following documents were made available at a website available to all potential stakeholders: http://www.mgminter.com.ar/Projeto_PCH_Faxinal_II as indicated in the letter inviting stakeholder comments:

Formatado: Não Realce

Código de campo alterado

Formatado: Sem sublinhado

Excluído: www.mgminter.com/download/projeto_pch_faxinalII

Formatado: Não Realce

Presentation on the FAXSHP II Project.

- Executive Summary of FAXSHP II Project.
- Project Design Document (PDD)
- Anexo III (regarding Resolution Nº 1 of the CIMGC)
- General Concepts on Greenhouse Effect and the Kyoto Protocol

E.2. Summary of the comments received:

The entities and persons who commented on the project were:

Formatado: Não Realce

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

Since all stakeholders consulted so far, support the project, no modifications to project design were necessary.

However, despite the acceptance of the project, we emphasize that the environmental aspects will be carefully observed with the objective to manage any eventual environmental impact.

Formatado: Não Realce

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Organization:	Centrais Eletricas Salto dos Dardanelos Ltda.
Street/P.O.Box:	Ilha do Salto Dardanelos, s/no,
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Country:	Brazil
Telephone:	55 49 3436 0103
FAX:	
E-Mail:	mabagra@mabagra.com.br
URL:	
Represented by:	Paulo Vitorino Favero
Title:	Director
Salutation:	
Last Name:	Favero
Middle Name:	Vitorino
First Name:	Paulo
Department:	
Mobile:	
Direct FAX:	
Direct tel:	55 49 3436 0103
Personal E-Mail:	

Formatado: Português (Brasil)

Organization:	MGM Carbon Portfolio, S.a.r.l
Street/P.O.Box:	121, Avenue de la Faïencerie, L-15511
Building:	
City:	
State/Region:	Luxemburg
Postfix/ZIP:	
Country:	
Telephone:	
FAX:	
E-Mail:	
URL:	
Represented by:	Ivana Cepon
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Formatado: Espanhol (Espanha-moderno)

Código de campo alterado

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

No public funding has been involved in financing this project activity.
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Annex 3

BASELINE INFORMATION

There is no further background information used in the application of the baseline methodology.

Annex 4

Formatado: Inglês (EUA)

MONITORING INFORMATION

The methodology describes the procedure and equations for calculating emission reduction from monitored data. For this specific project, the methodology is applied through a spreadsheet model. The staff responsible for project monitoring must complete the electronic worksheets on a monthly basis. The spreadsheet automatically provides annual totals in terms of GHG reductions achieved by the project. The model contains a series of worksheets with different functions:

- Data entry sheet (*Electricity Generation*)
- Result sheet (*Emission Reduction*)

Formatados: Marcadores e numeração

There are cells where the user is allowed to enter data. All other cells contain computed values that cannot be modified by the staff.

A color-coded key is used to facilitate data input. The key for the code is as follows*:*

- ***Input Fields:*** Pale yellow fields indicate cells where project operators are required to supply data input, as is needed to run the model;
- ***Result Fields:*** Green fields display result lines as calculated by the model.

Formatados: Marcadores e numeração

All the monitored data will be archived for two years following the end of the crediting period.

Annex 5

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