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

CONTENTS

Annexes

SECTION A. General description of project activity

A.1. Title of the project activity:

Title: Rio Taquesi Hydroelectric Power Project
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A.2. Description of the project activity:

The Rio Taquesi Hydroelectric Power Project (the "project activity" or "the Project") is a run-of-river hydroelectric power project with an effective capacity of 89.5 megawatts of renewable electricity in two in-cascade plants ("Chojlla" plant and "Yanacachi Norte" plant). The Project is located along the Taquesi and Unduavi Rivers, approximately 90 kilometers northeast of La Paz, the capital city, by road.

The Project's purpose is to provide clean energy to the Bolivian grid by using a renewable source alternative to the fossil-fueled sources (mainly natural gas-fired, open cycle turbines) that are the typical generation additions to the Bolivian system. Among other sustainability-related benefits, the Project avoids the emission of more than 5 million metric tons of CO_2-e during its projected 35-year life by displacing electricity that would otherwise be supplied to the Bolivian grid by fossil fuel-fired power plants as in the baseline scenario consisting in the addition of natural gas-fueled turbines for the supply of an equivalent amount of power, with zero emissions from the Project.

The Project has been built and is operated by Hidroelectrica Boliviana S.A. (HB) whose major shareholder is Tenaska Bolivia Holdings SRL, a subsidiary of the U.S. based Tenaska, a power company and energy supplier with expertise in power plant development, ownership and operation; natural gas and electric power marketing; fuel procurement and asset acquisitions. The Project has been granted all required permits and Licenses from the Environmental and Regulatory Authorities. The Superintendence of Electricity, acting as the Regulatory Authority, has granted HB the Generation License in the form of an Administrative Resolution to construct the project, the Resolution SSDE 052/97, later modified by Resolutions SSDE 097/98, SSDE 094/98 and SSDE-SSSB-001/2000. The latter was granted jointly with the Superintendence of Basic Water Services.

Besides the facilities Registered as a CDM activity, HB owns and operates another hydroelectric generating facility – named Chojlla Antigua – connected to the National Interconnected System through a 24.9 [kV] transmission line that is not the one that links the CDM project to the grid. Chojlla Antigua in not part of the Project as a CDM activity.

Through the Project HB contributes to sustainable development, including the production of renewable energy, creation of employment opportunities in a region with few such opportunities, and increase in the demand of local products and services. Thanks to the CDM as described in the additionality section, the Project could bring investment to a sector and a region not interesting for traditional investors.

The Project has provided an economic stimulus to the region as well as a sense of vitality and dynamism. The construction wages provided a significant monetary boost to a region that has long depended on a non-cash economy, and the investment in infrastructure and permanent jobs will ensure that the benefits endure. The Project also invested in the well-being of the region by providing a modern and multi-functional Health Care facility that is staffed and run in a cooperative arrangement with the Departmental Health Agency and the Yanacachi Municipal Government.

HB also aims to contribute to the maintenance of archaeological, cultural and environmental integrity of the region. To that end, HB created the Taquesi Foundation with three general objectives:
- Support the improvement of the quality of life of the region's inhabitants,
- Contribute to the conservation of cultural and archaeological resources,
- Work for the conservation of environmental quality within the area of influence of the Project.

The Taquesi Foundation has provided support for research, recovery and conservation efforts for numerous and important archaeological sites found in the Project area.

The Project constitutes a milestone in the history of power generation in Bolivia. This is the first totally private power project in the power sector of Bolivia and, at a time when hydrocarbon resources dominate the national energy portfolio due to low natural gas prices, the Taquesi Project demonstrates that, in the framework of global GHG mitigation efforts, renewable energy developments can be accomplished.

A.3. Project participants:

Name of Party involved	Private and/or public entity(ies) project participants	Party involved wishes to be considered as project participant (Yes/No)
Republic of Bolivia (host)	• Private entity: *Hidroelectrica Boliviana S.A.* • Public entity: *Vice Minister of Land Planning and Environment* • Private entity: *C-Trade - Comercializadora de Carbono Ltda.*	YES
Netherlands	• Private entity: *Corporación Andina de Fomento*	YES
Switzerland	• Private entity *Tenaska International Energy LLC*	NO

Of the three above participants, only Hidroeléctrica Boliviana S.A., a fully privately held company incorporated in Bolivia, developed and financed the project, whether directly or through third parties, such as contractors and lenders. Hidroelectrica Boliviana S.A. currently owns, operates and maintains all project-related facilities and assets.

A.4. Technical description of the project activity:

A.4.1. Location of the project activity:

A.4.1.1. Host Party(ies):

Republic of Bolivia (South America)

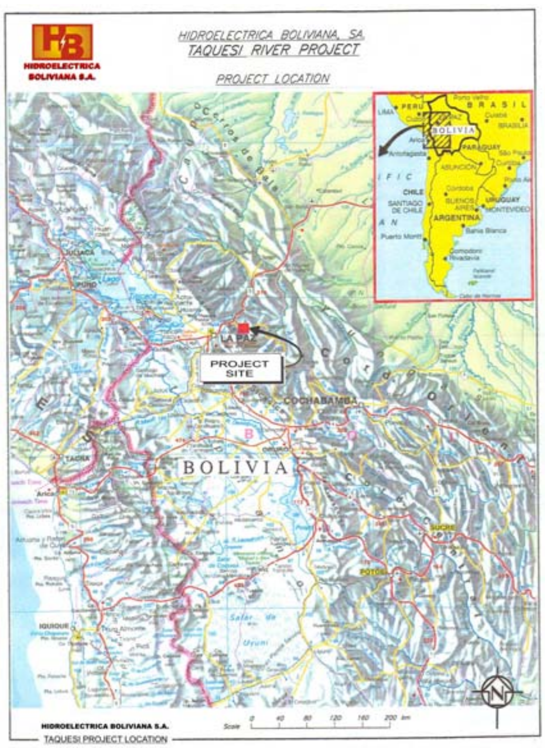
A.4.1.2. Region/State/Province etc.:

La Paz Department, Sud Yungas Province, Third Municipal Section (Yanacachi)

A.4.1.3. City/Town/Community etc.:

The project is close to Yanacachi and Chojlla towns.

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



The Project is located in the Yanacachi Municipal Section of Sud Yungas, a Province of the La Paz department, some 90 km by road from La Paz city, where the National Government has headquartered its Agencies.

The Yanacachi Norte plant is located on the Unduavi river, near the town of Yanacachi. The nearest (90 km by road) major city is La Paz.

The Chojlla plant is located on the Taquesi River, near the town of La Chojlla.

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

Energy Industries (sectoral scope 1) / Renewable energy / Grid-Connected Electricity Generation from Renewable Energy Sources / Run-of-River Hydropower Plants.

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

The Project will make use of known, conventional run-of-river hydroelectric generation technology, consisting of two in-cascade, run-of-river facilities, the Chojlla and Yanacachi Norte plants, of 38.4 and 51.1 MW respectively. The Chojlla Plant is composed of a diversion weir, with an impounding capacity of 110,000 m3, a 3.6 km tunnel and a 1.2 km long penstock. The powerhouse at Chojlla has a single turbine-generator, 580 m gross head unit. The Yanacachi Norte Plant has a weir and a daily regulation reservoir of 45,000 m3 connected to a 3.7 km long tunnel through a 400 m long covered canal. Yanacachi Norte's penstock is 1.2 km long and the plant has one single turbine-generator with 520 m gross head.

Approximately 10 km of 115 kV transmission line carries the electrical energy generated at the Chojlla and Yanacachi Norte plants to the Pichu Substation, which is the interconnection node to the National Interconnected Grid.

Commercial operation of the Project began on June 19, 2002. The expected total annual average generation output, of almost 309 GWh, is distributed over the peak, shoulder, and base load intervals as follows:

Peak period:	69 GWh
Shoulder period:	151 GWh
Base period:	89 GWh

One fifth to one fourth of the total injection is produced during the dry season (May to October) and the rest in the months of November to April.

Each plant is equipped with one Francis turbine-generator unit and ancillary systems. Chojlla's 580 m gross head Francis turbine, rated 38.4 MW, is, to the best of our knowledge, the highest in the world for Francis turbines. Yanacachi Norte's 520 meter head turbine-generator unit, rated 51.1 MW, is the second highest. Total length of transmission lines is around 10 km, operating at 115 kV.

Compared to hydropower developments based on large river impoundments, run-of-river projects have a very small footprint and a series of environmental advantages due to the very small area used. The footprint of the Rio Taquesi Hydroelectric Power Project is, in addition, reduced by the use of tunnels, rather than canals, and the extreme elevation gradient of the terrain that allows sufficient hydraulic head to be created within a short distance. Although similar technology has been used in other generating systems in the Country, the Project encompasses features like the use of daily instead of seasonal reservoirs on the river course, tunnels instead of canals and oil leakage prevention systems for environmental reasons, for instance, that no other existing plant incorporated, which constitutes part of the technology to transfer through its own implementation and the disclosure /explanation of such features to the Environmental Unit of the Sectoral Viceminister, who deems some of them replicable in future similar projects.

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

As described in the corresponding section, the Project's emissions reductions are a function of energy output. With the actual production of the Project from November 2007 to October 2008, assuming a given energy production for months and years to come of slightly below 309 GWh/year for the 12-month periods from July 1, 2009 onwards and a mean baseline emissions factor of 0.610 tCO_2/MWh, the resulting emissions reductions are projected as shown on the table below:

Crediting year	Total estimated annual emission reductions [tCO_2-e]
Year 1 (July 1, 2009-June 30, 2010)	188,485
Year 2 (July 1, 2010-June 30, 2011)	188,485
Year 3 (July 1, 2011-June 30, 2012)	189,001
Year 4 (July 1, 2012-June 30, 2013)	188,485
Year 5 (July 1, 2013-June 30, 2014)	188,485
Year 6 (July 1, 2014-June 30, 2015)	188,485
Year 7 (July 1, 2015-June 30, 2016)	189,001
Total estimated reductions [tCO_2-e]	1,320,427
Total number of crediting years	7
Annual average over the crediting period of estimated reductions [tCO_2-e]	188,632

The baseline emission factor has been estimated using the most recent information from the National Load Dispatch Committee (CNDC) as of November 2008.

A.4.5. Public funding of the project activity:

No public funding has been provided for the Project.

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:

The approved consolidated baseline and monitoring methodology ACM0002 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” version 8 is used, together with the Methodological “Tool to calculate the emission factor for an electricity system” version 01.1.

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

The Project activity is grid-connected electricity generation from a renewable energy source. From the number of different sub-types of this project activity, the Project corresponds to “Run-of-river” type of project.

The methodology chosen is appropriate for the Rio Taquesi Hydroelectric Power Project, since:

- The project activity is the installation of a set of power plants/units of the type: hydro power with a run-of-river reservoir;
- The project activity results in new reservoirs and the power density of the power plant is greater than 4 [W/m^2]. Indeed, power density of the project is much greater than 4 [W/m^2]. The aggregate power density is 3,774 [W/m^2], being the total capacity of the project 89.5 [MW] or 89,500,000 [W] and the total reservoirs area slightly over 2 [Ha] (23,713 [m^2]). Reservoirs are only for daily regulation and not seasonal regulation, thus the small surface at each reservoir. Areas of each reservoir are shown in the following spreadsheet.

Plant	Capacity [Watts]	Reservoir Area [m^2]	Power density [W/m^2]
Chojlla	38,400,000	12,238	3,138
Yanacachi Norte	51,100,000	11,475	4,453
Total	89,500,000	23,713	3,774

- The geographic and system boundaries for the relevant electricity grid (the Bolivian National Interconnected Grid) can be clearly identified and information on the characteristics of the grid is available;
- Project’s activities do not involve the switching from fossil fuels to renewable energy at the site of the Project activity.

Also, being this PDD an updated version for the second crediting period, the validity of the baseline has been assessed, being considered still valid, and the baseline is updated.
No significant changes in the relevant national and sectoral regulations during the first crediting period has occurred and the project activity is not mandated by any regulations. The Electricity Law and its

Regulations were not changed in that of relevance for this section. However, a change in the approach of the State to the market has occurred with the approval of the National Development Plan, which encourages and allows the Bolivian State to participate in the services chain (generation, transmission and distribution) and to recover a major role in the sectors, leaving behind its position as a regulator or policy maker only. As per the Capitalization Law effective in 1994, the Bolivian State handed over its former responsibilities as a power services provider, as did in other sectors as well, allowing private companies to participate in the electricity sector with the regulation rules set by the Electricity Law and the Sectoral Regulation System Law. This change will not affect the baseline scenarios, still dominated by the rationale behind the decisions on capacity additions, highly concentrated on the hydrocarbon resources and more or less unaffected by the nature (governmental or private) of the players in the power sector.

For updating the baseline at the start of the second and third crediting period, new data available is used and the baseline scenario and emissions are revised. There is no need to incorporate the impact of new regulations on baseline emissions.

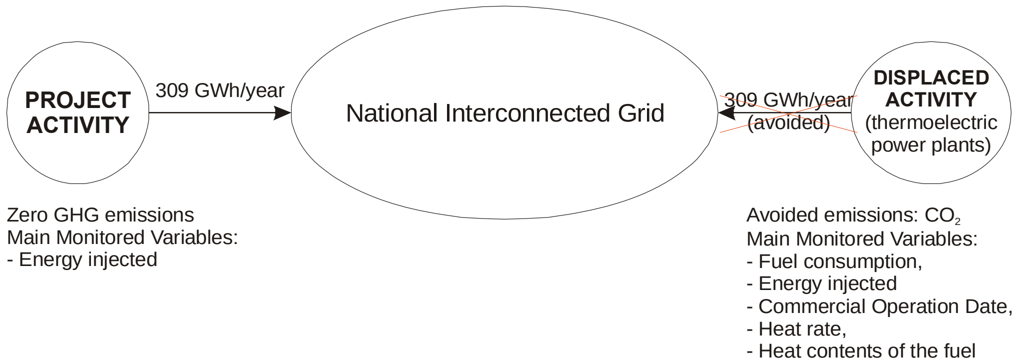
B.3. Description of the sources and gases included in the project boundary:

Only CO_2 emissions from electricity generation in fossil fuel fired plants displaced by project activity are accounted for. Therefore, only carbon dioxide (CO_2) from combustion in fossil fuel-fired units connected to the National Interconnected Grid is considered in the baseline. The spatial extent of the project boundary includes the project site and all power plants connected physically to the electricity system that the Project is connected to, that is the already mentioned National Interconnected Grid (its acronym in Spanish is SIN) that currently links six of the nine departments of the country and is expected to get enlarged by new transmission facilities to construct in the future. At present, no imports or exports occur in the Project system because the SIN is not linked to a foreign electricity system and the SIN is the only interconnected system of the country. Power projects to feed the Bolivian grid can be built almost anywhere in the country provided that transmission facilities are available or projected to connect the prospect generator to the SIN.

The table below further explains the sources and gases included in the project boundary.

	Source	Gas	Included?	Justification / explanation
BASELINE	Natural Gas - fueled generating units connected to the Grid	CO_2	YES	Accounts for CO_2 emissions from electricity generation in fossil fuel fired power that is displaced due to the Project activity (natural gas and dual – diesel and natural gas – units).
PROJECT ACTIVITY	NONE IDENTIFIED	NONE		As the Project is a hydropower development with very limited water-storage capacity, no emissions from the Project Activity were identified.

The following flow diagram shows the project boundary and the exchanges in power due to the Project Activity.



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

As per the ACM0002 methodology rule, the baseline scenario considered is the following: electricity delivered to the grid by the project would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in subsequent sections.

In the absence of the project activity, the most plausible additions of power for the grid are natural gas-fired turbines. This is a credible scenario since other developers have installed this type of electric generation capacity in Bolivia over the last five years.

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):

The approved consolidated baseline methodology ACM0002 utilizes the "Tool for the demonstration and assessment of additionality" as approved by the CDM Executive Board. Results of this required analysis are presented below.

This analysis follows the steps outlined in the approved approach to demonstrate and assess additionality with respect to the potential emissions reductions associated with the operation of the Project. These steps include:

- Identification of alternatives to the Project activity;
- Investment analysis to determine that the proposed Project activity is not the most economically or financially attractive;
- Barriers analysis;
- Common practice analysis; and
- Impact of registration of the proposed Project activity as a CDM project activity.

The information presented below is provided as part of the Project Design Document for the Rio Taquesi Hydroelectric Power Project activity as required in the approved baseline methodology ACM0002, version 06.

STEP 1: Identification of Alternatives to the Project Activity Consistent with Current Laws and Regulations

Realistic and credible alternatives to the Project activity that can be the baseline scenario through the following sub-steps were considered.

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

The following alternatives to the Rio Taquesi Hydroelectric Power Project activity are considered:

- The proposed Project not undertaken as a CDM project activity.
- Addition of electric generation capacity in the form of natural gas fired combustion turbines connected to the same Bolivian grid system. This is a credible alternative because other developers have installed this type of electric generation capacity in Bolivia over the last five years.
- No Project activity or other alternatives are undertaken.

Sub-step 1b. Enforcement of applicable laws and regulations:

1. “The alternative(s) shall be in compliance with all applicable legal and regulatory requirements, even if these laws and regulations have objectives other than GHG reductions, e.g. to mitigate local air pollution. (This sub-step does not consider national and local policies that do not have legally-binding status.)”

Each of the alternatives above could be undertaken in compliance with all applicable legal and regulatory requirements. In the case of the Project activity, there are no legal requirements to participate in the CDM. In the case of installation of natural gas-fired combustion turbines, it is known that several such units have been installed in Bolivia, apparently in conformity with all applicable legal and regulatory requirements. Finally, there is no legal or regulatory requirement that any project activity or alternative should necessarily be undertaken by the Project participants. All alternatives pass this criterion.

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

This criterion is not applicable, since all alternatives comply with all applicable legislation and regulations.

3. “If the proposed project activity is the only alternative amongst the ones considered by the project participants that is in compliance with all regulations with which there is general compliance, then the proposed CDM project activity is not additional.”

Only alternatives that would be in compliance with all laws and regulations were considered. The proposed Project activity passes this criterion.

STEP 2: Investment Analysis

"Determine whether the proposed project activity is the economically or financially less attractive than other alternatives without the revenue from the sale of certified emission reductions (CERs). To conduct the investment analysis, use the following sub-steps:"

Sub-step 2a. Determine appropriate analysis method

After studying the options that are available to analyze the additionality of the Rio Taquesi Hydroelectric Power Project, i.e., simple cost analysis, investment comparison or benchmark analysis, it has been concluded that the benchmark analysis is the most appropriate methodology for the Project. The benchmark analysis has been chosen because that is the evaluation criterion that was used by the Project principals in their decision as to whether or not to invest in the Project. The simple cost analysis is not appropriate because the Project will derive economic benefits, including among other items a revenue stream for the capacity and energy produced by the Project, other than CDM related income.

An investment comparison was also not the appropriate analysis to determine the additionality of the Project. The Project was not compared to other projects in Bolivia by the shareholders in HB. The opportunity to invest in the Project was brought to the shareholders by the initial developers of the Project. In their decision of whether or not to invest in the Project, the shareholders evaluated the Project's structure, the Bolivian electricity market, Bolivian regulation and the economics of the Project, the feasibility and advantages of participating in a scheme such as the CDM as well as other criteria against the benchmarks that had been established for projects of this type located South America, not a comparison against similar projects in Bolivia.

Sub-step 2b. – Option I. Apply simple cost analysis

2. Not applicable. The Project produces economic benefits other than just the CDM related income.

Sub-step 2b. – Option II. Apply investment comparison analysis

3. Not applicable. The investment decision was not based on a choice between multiple project opportunities.

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

4. The decision by HB's largest shareholder, Tenaska Bolivia Holdings SRL ("TBH"), of whether or not to invest in the Project was based on an evaluation of the Project against several benchmark criteria. The benchmark criterion against which the Project was measured was of economic nature although other non-economic factors were also assessed. The non-economic aspects reviewed by TBH in its decision of whether or not to invest in a project include the regulatory environment in the Project's jurisdiction, the consistency with which the rules and regulations governing the electricity industry are fairly applied by the industry's regulating bodies, a transparent process for determining pricing within the

industry, the Project's ability to meet the relevant environmental standards, the ability to finance a significant part of the project's capital requirements with debt and others.

The primary economic benchmark used by TBH in its decision whether or not to participate in a project is its rate of return as measured by the project's after tax IRR. The threshold after tax IRR for TBH to invest in a project in a third world country is 20%. This threshold is applied consistently by Tenaska, Inc, representing TBH's shareholders, to all of the projects that it evaluates. Third party documents evidencing the consistent application of this financial benchmark by the company is available.

Sub-step 2c. Calculation and comparison of financial indicators (only applicable to options II and III):

5. The following table shows the Project's After Tax IRR with and without CDM related income. The After Tax IRR is calculated based on a comprehensive forecast of the cash flows throughout the Project's assumed useful life of thirty-five (35) years. The cash flows include, among other items:

- The amount and timing of equity contributions by HB's shareholders during construction of the Project.
- The forecast Project revenues. The revenue forecast was based on a third-party market study used to forecast future capacity and energy prices. Also, three hydrology studies were used to forecast the amount of water that would be available in the watershed for the production of electricity.
- The forecast Project operating expenses.
- The Project's forecast financial costs as determined by indicative debt terms received from several multi-lateral financial institutions and the local capital market.

Rate of Return

	Case 1: Without CDM related income	Case 2: With CDM related income
After Tax IRR	17.5%	20.0%

6. "Present the investment analysis in a transparent manner". A summary of the investment analyses is provided in Annex 5 for Case 1 (without benefit of CER sales) and Case 2 (with benefit of CER sales).

7. The only difference in assumptions between Case 1 and Case 2 in the Rate of Return Table above is the addition of revenue related to the sale by the Project of CER's

8. "Present in the CDM-PDD submitted for validation a clear comparison of the financial indicator for the proposed CDM activity and:

a. The alternatives, if Option II is used". Not applicable.
b. "The financial benchmark, if Option III is used". The table above shows the forecasted After Tax IRR for the Project based on two sets of assumptions. In Case 1, the Project does not receive any CDM related income. The After Tax IRR for Case 1 is only 17.5%. This rate of return is below the benchmark that Tenaska uses to determine whether or not it will invest in a project opportunity. In Case 2, it is assumed that the Project will received CDM related income. When the additional income is factored into the cash flow projections, the Project just achieves the benchmark After Tax IRR of 20% for Tenaska to invest in the Project.

Sub-step 2d. Sensitivity analysis (only applicable to options II and III):

9. Please see table below for a sensitivity analysis for Cases 1 and 2. The analysis shows that Project does not meet the benchmark rate of return set by Tenaska to participate in an electric generation project in a country outside of the United States without the CDM related income.

Sensitivity Analysis

Assumption Tested	Case 1 After Tax IRR	Case 2 After Tax IRR
Base Case	17.5%	20.0%
A: 10% Increase in Operating Expenses	17.3%	19.9%
B: 10% Increase in Transmission Tolls	17.3%	19.9%
C: 10% Reduction in Capacity Revenue	16.0%	18.6%
D: 10% Reduction in Energy Revenue	16.4%	19.0%
E: 10% Reduction in Total Revenue	15.0%	17.6%
F: 25% Reduction in Water Flow	16.0%	18.2%
G: Combined Downside Case	13.3%	15.6%
H: 10% Increase in Capacity Revenue	18.9%	21.4%
I: 10% Increase in Energy Revenue	18.5%	21.0%
J: 10% Increase in Total Revenue	19.9%	22.4%
K: 25% Increase in Water Flow	18.9%	21.8%

The table above also shows that even in the upside sensitivity cases (Cases H, I, J and K), the rate of return for Case 1 (no CDM related income) does not meet the benchmark set by Tenaska to invest in a project such as the Rio Taquesi Hydroelectric Power Project. The sensitivity analysis confirms that without the CDM related income, the Project does not meet the benchmark rate of return set by Tenaska.

STEP 3. Barrier Analysis

If this step is used, determine whether the proposed project activity faces barriers that:

(a) Prevent the implementation of this type of proposed project activity; and
(b) Do not prevent the implementation of at least one of the alternatives.

The Project faced barriers other than economic and financial that could readily have prevented the implementation of a project of its type, and did significantly impact the ultimate development and economics of the project. Among other impacts, the barriers restricted the availability of financing options for the Project. At the same time, these barriers would be much less likely to prevent the implementation of alternative projects of the kind that are prevalent in Bolivia – namely natural gas fired simple cycle combustion turbines. Indeed, that is what the record indicates - it has been predominantly alternative projects that have been developed.

Use the following sub-steps:

Sub-step 3a. Identify barriers that would prevent the implementation of type of the proposed project activity:

"1. Establish that there are barriers that would prevent the implementation of the type of proposed project activity from being carried out if the project activity was not registered as a CDM activity. Such barriers may include, among others:

- Investment barriers, other than the economic/financial barriers in Step 2 above, inter alia:
  - Debt funding is not available for this type of innovative project activities.
  - No access to international capital markets due to real or perceived risks associated with domestic or foreign direct investment in the country where the project activity is to be implemented."

Investment barriers do exist in Bolivia, and they are known to affect the availability of project financing and access to international capital markets. As was stated in Sub-step 2b above, one of the assessment criteria used by TBH to evaluate the Project was the ability to finance a significant portion of the Project's capital requirements with debt. Risk factors that are unique to the Project directly contribute to barriers in the Project's ability to raise debt financing. Risk factors may be assigned generally to "country risk" – the real or perceived risk of doing business in Bolivia, and to specific risks associated with a particular project. The degree of impact of the risks associated with the Project is significant, as it shapes the availability and pricing of potential debt funding for the Project which in turn contributes to a return on investment for the Project that does not meet the investor's benchmark levels and threatens the Project's viability. Securing CDM eligibility would materially improve the strength of the Rio Taquesi Hydroelectric Power Project and help to re-establish its long-term fiscal health.

Bolivia has a long and well-documented history of political and economic turmoil. Bolivian country risk has always figured prominently in any merit evaluation for financing infrastructure in the country. Multilateral lenders, including the World Bank, the International Finance Corporation (IFC), the Inter-American Development Bank (IDB), the U.S. Export-Import Bank (U.S. Ex-Im), and the Andean Development Bank (Corporación Andina de Fomento - CAF) are often reluctant to place loans in Bolivia, and put significant qualifiers and restrictions on any funds they do provide. These restrictions are proportional to the degree of perceived risk a project is exposed to. Documentation of the risks perceived by such potential lenders is available in the form of a term sheet offered to TBH related to the Project that includes, in its C loan provisions, notably onerous terms.

Lending constraints not only make funding for Bolivian infrastructure projects more difficult to secure, but also make the terms and conditions of the debt more onerous for the projects that do qualify for debt funding. The main lending terms and conditions for a typical project include the interest rate spread over an international interest rate indices (often LIBOR), minimum debt service coverage ratios for defaults and cash distributions, the lenders ability to withdraw cash from the project (sweep policies), contingency reserve requirements and lender's origination costs, among others. The degree to which these terms and conditions become unfavorable to the borrower are magnified across the board for this Project due to the Bolivian country risk and other barriers/risk unique to the Project itself. When financing can be secured, the costs and terms associated with the financing are among the principal factors in determining the Project's rate of return and therefore have a large role in determining whether or not a proposed project will go forward.

Other barriers imposed by risk are especially relevant to and amplified for projects with the characteristics of the Rio Taquesi Hydroelectric Power Project. Generally; projects having high capital costs and long development timelines tend to be more sensitive to risk. More specifically, the risk exposure of the Rio Taquesi Hydroelectric Power Project is much greater than alternative power generation projects in Bolivia. Projects undertaken in the eastern slope of the Andes are subject to extreme physical and temporal challenges that complicate construction, extend schedules, and impact costs. These challenges include:

- *Access to the project sites* – The Taquesi Hydroelectric Power Project is located in a region of extreme terrain. While only 40 km from La Paz (in straight line), land access to the project site involves significant altitude change over marginal roads. Project components and equipment generally arrive via La Paz and must be trucked over a pass at 4,700 meters (15,500 feet), then descend rapidly into the Unduavi River valley at approximately 1,500 meters, and then ascend once again to the upper reaches of the project area at from 2,500 meters to more than 3,000 meters, all in a distance of less than 100 km. The roads, single lane in many places, are narrow, winding and poorly maintained. They overlook sheer drop-offs and are overhung by landslide-prone cliffs. This type of access makes transporting heavy equipment and oversized components dangerous and risky, and subject to loss or delay.

- *Civil engineering challenges* – The civil engineering component of the Project is tremendously difficult. Gradients are extreme, slopes are unstable. There was no road access to critical Project areas. Water for power generation descends a tortuous route from snow-pack in the upper reaches of the Taquesi River watershed to the power house on the Unduavi River, a descent that includes some 1,100 meters of vertical head, two diversion structures, 7,100 meters of tunnels bored through rock, 2,450 meters of steel penstock, and associated works. The same physical characteristics that allow the Project to extract significant amounts of energy from a relatively small flow of water greatly complicate its construction, create greater risk exposure, and increase its capital cost.

- *Schedule* – The development and construction schedule for a complex project like the Rio Taquesi Hydroelectric Power Project imposes barriers not faced by alternative generation projects in Bolivia. The timeline for the Project is significantly greater than for alternative projects. An extended schedule creates increased exposure to adverse conditions, increases exposure to construction risk, and generally elevates financing and development costs, At the same time, the longer timeline exposes a project to greater potential for contingent impacts like legislative and regulatory change, which can alter project fundamentals.

- *Hydrology* – The Rio Taquesi Hydroelectric Power Project faces risk from variations in precipitation and associated water flow in the watershed. Being a run-of-river hydro project, the Project does not have significant water impoundment, and is largely dependent upon in-stream flow rates for it ability to generate power. An additional hydrology-associated risk faced by the Project was a lack of suitable data on the hydrology of the watershed, which added uncertainty to project design and performance projections.

- *Transmission* – The Rio Taquesi Hydroelectric Power Project is located at a considerable distance from the Trunk Integrated Grid. Power generated by the project is delivered over a 115 kV radial transmission line to a substation near La Paz, some 70 km away from the project site . Radial transmission lines are by definition single points of interconnection and impose added risk - should they fail there is no alternative power delivery path or contingency available. The radial line serving the Rio Taquesi Hydroelectric Power Project traverses the same rugged terrain described above. It is exposed to outages related to tree contacts, landslides, and frequent lightning strikes.

- *Regulatory risk* – Risks associated with the legal and regulatory structures of Bolivia contribute significantly to overall country risk. In addition, the Rio Taquesi Hydroelectric Power Project has a higher degree of exposure to regulatory risk than alternative projects. Bolivia reimburses generators through a marginal cost dispatch mechanism, with financial compensation calculated on the basis of incremental additions of natural gas fired turbines. This mechanism effectively under-values capacity for more capital intensive investment projects like the Project. Since capital intensive projects in Bolivia cannot recoup their capital investments on the basis of capacity payments set by regulation alone, they must rely on the energy-price component of the electricity tariff to make up the difference. This imbalance exposes high capital cost projects to risks related to changes in and manipulation of the payment mechanism by the regulatory system. For example, due to regulatory manipulation, it is now possible to bid the price of natural gas at below market levels, thereby lowering the energy price component in order to ensure dispatch. The result of this unintended manipulation is that the energy price component becomes insufficient to make up the difference between the necessary revenue needed for capital recovery and the low capacity prices prevalent in the Bolivian electricity market, leaving a project like the Rio Taquesi Hydroelectric Power Project unable to meet financing obligations and placing it at risk to default.

- *Non-Recourse risk* – In developing countries, it is common for project lenders to establish a security interest in the Project's assets. Typically the security interest gives the lenders the ability to foreclose on the security and remove project assets in the event of a default on the project loan. This is a viable option for lenders in situations where capacity increments are satisfied by thermal generation units – combustion turbines or reciprocating engines are relatively easy to relocate. In the case of the Project, this obviously was not an option - the Project assets are specifically made for the Project and are immovable, therefore the assets have very little salvage value. In the event of a default, lender recourse is limited to either operate or not operate the Project, or sell it as a distressed asset.

The risks identified above have imposed barriers on the viability of the Project that, absent its registration as a CDM activity, will seriously threaten its long-term economic well-being, At the time of the investment decision, HB's shareholders were in a position to consider investments of other types and in other countries. The barriers to investment described above were considered by the shareholders but the benefits of CDM participation helped to counter these concerns.. At the same time, alternative power generation projects in Bolivia – namely natural gas fired combustion turbine projects - do not face the same degree of exposure or have the same level of impact. (This contention will be further delineated in Sub-Step 3b.)

Direct impacts resulting from the barriers associated with these risks were readily apparent in the investigation of financing options available to the Project. Multilateral lenders, keenly aware of country and project specific risk, nonetheless showed real interest in the project. It was closely scrutinized by CAF and the IFC, who submitted financing term-sheets. However, their indicative terms and conditions were consistent with higher risk projects, and were untenable.

HB's discussions with multilateral financial institutions revealed a number potential debt funding terms that were indicative of the increased risk associated with the Project. Many of these potential debt funding terms were objectionable to HB and resulted in significant barriers to raising debt funding for the Project. Examples of these debt terms included:

- The requirement by the lender of a Project Completion Agreement among the Project sponsors, HB and the lender. This term is indicative of the high degree of project completion risk associated with the Project.

- An interest rate margin on potential "A", "B" and "C" Loans that were considered to be higher than market standards by HB. The higher pricing indicates that the potential lenders considered the Project to be risky and wanted to be compensated for accepting the additional risk.

- Mandatory prepayment provisions that included sources of cash not typically used for prepayment of debt (VAT credits). This term indicates that the potential lenders wanted to reduce their exposure to the Project's risk by including provisions to pay down the debt faster than originally scheduled.

- The inclusion of a "C" Loan that carried a fixed interest rate of 15%. The "C" Loan also included provisions for the lender to receive additional interest payments once the return on equity exceeded 18%. This is another example of potential lenders wanting to be compensated for accepting the additional risk associated with the Rio Taquesi Hydroelectric Power Project.

- Mandatory prepayments of the loans if the Project was performing better than projected. This is another example of the lender wanting to reduce its exposure to project risk by being paid back faster than originally scheduled.

- A date certain for the last disbursement of debt financing. This provision limits the lender's exposure to delays in project completion.

- A date certain for the commencement of principal repayment on the various loans. This provision also limits the lender's exposure to delays in project completion.

- The requirement of a Debt Service Reserve Account equal to the next twelve months of senior debt service. The market standard is six months.

- Restrictions on HB's ability to distribute dividends unless the Debt Service Coverage Ratio ("DSCR") is equal to or higher than 1.5. The market standard for dividend release conditions is closer to a DSCR of 1.1 to 1.2.

The inability to attract suitable multilateral funding ultimately placed the Project in jeopardy, and forced the sponsors to seek other financing alternatives.

As the information developed earlier in Sub-step 2c.: "Calculation and comparison of financial indicators" points out, sponsor financial models projected returns on investment for the non-CDM case to be below the sponsors' international investment rate-of-return threshold of 20%. Using assumptions from indicative multilateral term-sheets, the financial model produced projected rates of return on investment far below those acceptable to Project sponsors, even for the case including CDM-related revenue.

- Technological barriers, inter alia:
  - Skilled and/or properly trained labour to operate and maintain the technology is not available and no education/training institution in the host country provides the needed skill, leading to equipment disrepair and malfunctioning;
  - Lack of infrastructure for implementation of the technology.

- Barriers due to prevailing practice, inter alia:
  - The project activity is the "first of its kind": No project activity of this type is currently operational in the host country or region.

These barriers, technological and due to prevailing practice, do not have primary application to the Project.

The identified barriers are only sufficient grounds for demonstration of additionality if they would prevent potential project proponents from carrying out the proposed project activity if it was not expected to be registered as a CDM activity.

"2. Provide transparent and documented evidence, and offer conservative interpretations of this documented evidence, as to how it demonstrates the existence and significance of the identified barriers. Anecdotal evidence can be included, but alone is not sufficient proof of barriers. The type of evidence to be provided may include:
(a) Relevant legislation, regulatory information or industry norms;
(b) Relevant (sectoral) studies or surveys (e.g. market surveys, technology studies, etc) undertaken by universities, research institutions, industry associations, companies, bilateral/multilateral institutions, etc;
(c) Relevant statistical data from national or international statistics;
(d) Documentation of relevant market data (e.g. market prices, tariffs, rules);
(e) Written documentation from the company or institution developing or implementing the CDM project activity or the CDM project developer, such as minutes from Board meetings, correspondence, feasibility studies, financial or budgetary information, etc;
(f) Documents prepared by the project developer, contractors or project partners in the context of the proposed project activity or similar previous project implementations;
(g) Written documentation of independent expert judgements from industry, educational institutions (e.g. universities, technical schools, training centres), industry associations and others."

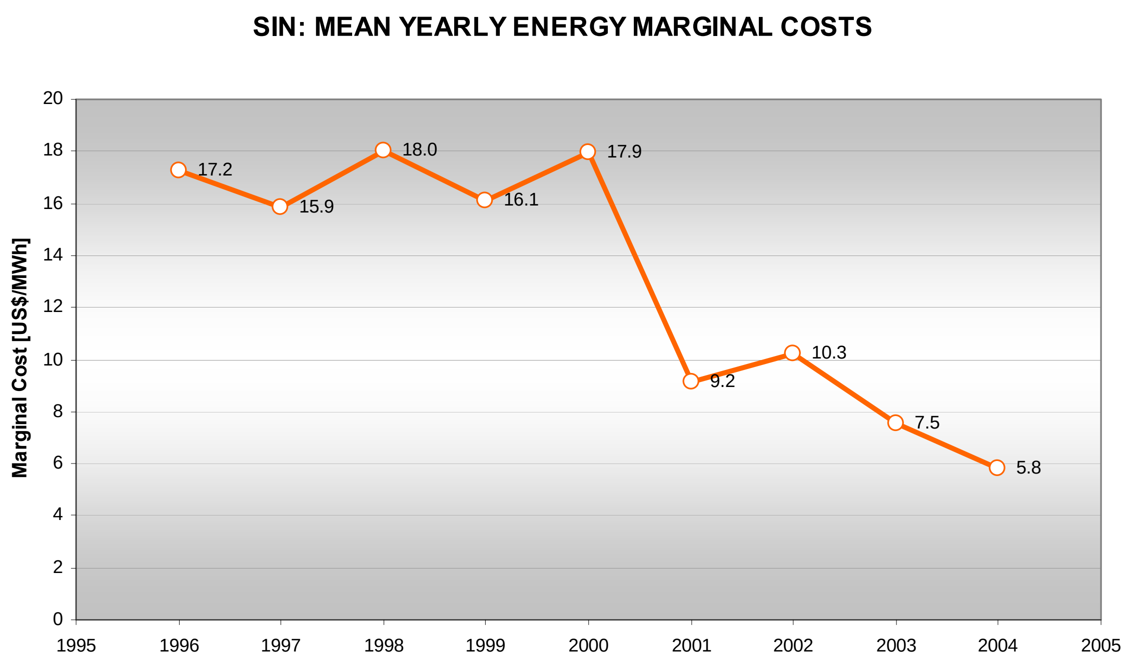
- Risk perception of potential lenders.

  The indicative term sheet received from the IFC when trying to get funds for the project, provides evidence of the assertion made in Sub-step 3a that project sponsors experienced barriers due to elements of risk associated with the Rio Taquesi Hydroelectric Power Project and were unable to secure commercially competitive and suitable international financing. The Project approached a variety of multilateral lending sources, and was scrutinized in detail by the IFC and CAF.

  The commercial terms offered by the multilateral lenders would have imposed significant barriers to securing acceptable international funding by the Project, and would have resulted in a project incapable of meeting reasonable financial expectations. The commercial terms, when taken in aggregate, rendered the offer from IFC untenable, and resulted in imposing barriers to competitive financing for the Project.

- Marginal Generating Cost and Natural Gas Prices

As an example of a barrier linked to regulatory risk as discussed in Sub-step 3a.1, the data from the CNDC in below graphic illustrates a precipitous decline in the value of the marginal, or energy, component of generation between the 2000 and 2001 reporting periods. This dramatic decrease in energy costs had severe impacts on Project revenue, and was the direct result of changes in the application of regulations establishing electricity prices in Bolivia. As a result of this, the average annualized cost of energy fell from US$ 17.94/MWh in 2000 to US$ 9.15 in 2001, a drop of 49%. The cost of energy has since maintained its reduced level, with an average cost for 2003 at US$ 7.52, or a 58% reduction from 2000 prices, and an average cost of US$ 5.8 for 2004. This remarkable decrease in the value of the energy component, with no corresponding decrease in associated production costs, has had a significant impact on the economics and viability of the Project, reducing anticipated revenues to a level inadequate to service debt and placing the Project at risk to default. The risk of a decline in energy payments due to regulatory changes beyond the developer's control was one of the barriers recognized by the Project developer, and events have shown these early concerns to be justified.



Source: National Load Dispatch Committee

This materially adverse turn of events was a direct result of a subjective application of Bolivian electricity regulation, and is an example of a barrier linked to regulatory risk as discussed in Sub-step 3a.1 above. Essentially, the regulation allows now manipulation of the pricing mechanism by competitors to the Project. The regulatory and economic framework of the Bolivian electricity sector anticipated, for bidding purposes, a gas price to be the government-established natural gas price (of US $ 1.30/MMBtu in 2000) or the price agreed upon by the thermal generators and the gas supplier and included in their supply agreement. Each of the natural gas prices bid by the thermal generators for June 2005 were well below the US$ 1.30/MMBtu price – with out any contract data supporting the offer – and reflect the new regulation by means of which the thermal generators can bid any price between certain limits, being the upper limit US$ 1.30/MMBtu, independently of the gas price in actual market conditions.

By underbidding the regulated base price (and also the market price of natural gas), thermal generators bid at below their costs of production in an attempt to ensure dispatch and thereby receive a capacity payment. The unanticipated consequence of this action has been a sharp drop in electricity prices across the system, with the tacit approval of regulators, but has also placed aspects of the generating sector under acute stress. While this practice has had some repercussions for thermal generators, it has been devastating to higher capital cost generators like the Project, and stands as a clear example of a barrier to project viability imposed by regulation. It is a barrier that has been disproportionately applied to the Project, and is a barrier that will likely prevent any further development of run-of-river hydroelectric projects in Bolivia.

Sub-step 3 b. Show that the identified barriers would not prevent the implementation of at least one of the alternatives (except the proposed project activity):

“3. If the identified barriers also affect other alternatives, explain how they are affected less strongly than they affect the proposed CDM project activity. In other words, explain how the identified barriers are not preventing the implementation of at least one of the alternatives. Any alternative that would be prevented by the barriers identified in Sub-step 3a is not a viable alternative, and shall be eliminated from consideration. At least one viable alternative shall be identified.”

As referenced above, risk-related factors impose distinct barriers to development of the Taquesi Hydro Project. Sub-step 3a elaborates the effects of specific risks on the Project. In this section, we will demonstrate that while some of the same barriers generally exist for alternative generation projects – namely natural gas fired combustion turbine projects – their influence on those projects is greatly reduced and is in several cases non-existent.

An item by item examination of the barriers identified in Sub-step 3a reveals the following:

- *Country risk* – While it is acknowledged that all infrastructure projects in Bolivia are affected by country risk, the degree of that effect varies from project to project. Projects that are less capital intensive and have shorter development and construction cycles are less prone to the effects of country risk. Alternative projects in Bolivia are less capital intensive on a per kilowatt basis, and can be put into operation much more quickly than a run-of-river hydroelectric project like the Rio Taquesi Hydroelectric Power Project, thereby lowering their exposure to country risk.

- *Project site access* – Most natural gas fired combustion turbine projects are sited where major natural gas pipelines and high voltage transmission lines are in close proximity. These proximities often occur in areas that have existing infrastructure and roads. In Bolivia they tend to be in the area around Santa Cruz, in relatively uniform terrain. Site access in this zone is relatively easy, roads are good, and associated risks are greatly reduced.

- *Civil engineering challenges* – Alternative projects in Bolivia not only enjoy easy site access but typically present few challenges with regard to site topography and conformation. Civil works are largely a matter of clearing and grading. Any site that would require substantial civil alteration would quickly be eliminated as a candidate for development.

- *Schedule* – The time required to develop and construct a natural gas fired combustion turbine project is significantly less than that required to develop and construct the Rio Taquesi Hydroelectric Power Project. A typical simple cycle combustion turbine peaking plant can be constructed in a matter of months, as opposed to several years for a run-of-river hydro. Consequently, the risk exposure associated with time is dramatically reduced.

- *Fuel risk* – In the case of a hydro project, this risk is characterized as hydrology risk – the amount of water available for power generation at any particular time. For a gas-fired project, an equivalent risk would be fuel supply risk. This risk can be defined by whether or not natural gas available when the plant is dispatched. In the case of hydrology, the variables are largely outside the control or influence of the plant operator. There is no way to control precipitation, for example. For a thermal project utilizing natural gas, the fuel supply risks are much more manageable. If there is a disruption in supply, it can be identified and addressed very directly. Disruptions are normally of short duration. Should a disruption be longer term, arrangements for an alternative supply can normally be made.

- *Transmission* – Unlike a run-of-river hydro project, a natural gas fired combustion turbine plant enjoys considerable flexibility in siting. One of the primary criteria used in site selection is access to suitable transmission, with good routing alternatives. It would be rare and generally unnecessary for an alternative project to face a radial line outage risk of the type dictated by the location of the Taquesi Hydro Project.

- *Regulatory risk* – The regulatory risk case delineated in the section above discusses the Bolivian marginal cost dispatch mechanism, whose application tends to undervalue capacity and shift compensation to the energy component. This scenario is generally more favorable for low capital cost projects like the alternative projects. For a natural gas fired combustion turbine, the capacity component in Bolivia is normally sufficient to cover fixed cost obligations. The project is then in a more favorable position to be profitable. As the price of natural gas in Bolivia becomes increasingly politicized, the risk of natural gas price manipulation becomes more likely, imposing even greater burdens on capital-intensive projects like the Taquesi Hydroelectric Power Project.

- *Non-recourse risk* – Thermal projects, especially the simple cycle combustion turbine projects typically utilized in Bolivia, provide lenders with tangible assets that can be pledged as security and seized and relocated in the event of a default. The combustion turbine/power island represents the majority of project assets. The class of turbines typically used to provide incremental capacity in Bolivia is relatively easy to relocate. This provides lenders with a recourse option unavailable to those who would fund a hydro project, and lowers the overall project risk profile accordingly.

As the risk comparison above demonstrates, the effects of the various risk-related barriers identified for the Rio Taquesi Hydroelectric Power Project have less of an adverse impact on the alternative plants in every case. To our knowledge, no alternative project in Bolivia has been nor should be prevented from implementation due to the barriers identified in this review. On the other hand, all of the identified risks have the potential to significantly impact the Rio Taquesi Hydroelectric Power Project, and in most cases have indeed already done so.

The results of conducting the Step 3. Barrier Analysis clearly demonstrate that the Rio Taquesi Hydroelectric Power Project has been and continues to be subject to barriers that have had a material influence in the financing and overall development, construction and operation of the Project. HB further believes the alternative gas fired simple cycle combustion turbine projects are not affected by the same barriers, and that the barriers have not caused an inability for them to be implemented.

→ *If both Sub-steps 3a – 3b are satisfied, proceed to Step 4 (Common practice analysis)*
→→ *If one of the Sub-steps 3a –3b is not satisfied, the project activity is not additional.*

STEP 4: Common Practice Analysis

"The above generic additionality tests shall be complemented with an analysis of the extent to which the proposed project type (e.g. technology or practice) has already diffused in the relevant sector and region. This test is a credibility check to complement the investment analysis (Step 2) or barrier analysis (Step 3). Identify and discuss the existing common practice through the following sub-steps:"

Substep 4a. Analyze other activities similar to the proposed project activity:

1. "Provide an analysis of any other activities implemented previously or currently underway that are similar to the proposed Project activity. Projects are considered similar if they are in the same country/region and/or rely on a broadly similar technology, are of a similar scale, and take place in a comparable environment with respect to regulatoy framework, investment climate, access to technology, access to financing, etc. Other CDM project activities are not to be included in this analysis. Provide quantitative information where relevant."

The Rio Taquesi Hydroelectric Power Project utilizes proven technology to generate electricity from surface water hydrologic resources in Bolivia. Other hydropower projects have also been constructed in Bolivia, utilizing generally similar technology, so it is appropriate to assess whether the Project activity represents common practice in the area.

Substep 4b. Discuss any similar options that are occurring:

2. "If similar activities are widely observed and commonly carried out, it calls into question the claim that the proposed project activity is financially unattractive (as contended in Step 2) or faces barriers (as contended in Step 3). Therefore, if similar activities are identified above then it is necessary to demonstrate why the existence of these activities does not contradict the claim that the proposed project activity is financially unattractive or subject to barriers. This can be done by comparing the proposed project activity to other similar activities, and pointing out and explaining essential distinctions between them that explain why the similar

activities enjoyed certain benefits that rendered it financially attractive (e.g. subsidier or other financial flows) or did not face the barriers to which the proposed project activity is subject."

3. "Essential distinctions may include a serious change in circumstances under which the proposed CDM project activity will be implemented when compared to circumstances under which similar projects were carried out. For example, new barriers may have arisen, or promotional policies may have ended, leading to a situation in which the proposed CDM project activity would not be implemented without the incentive provided by the CDM. The change must be fundamental and verifiable."

As of 1999, only 38% of the interconnected grid's available capacity came from hydroelectric resources. The remaining portion came from natural gas-fueled plants (60%) and from diesel plants (2%).

As per the next Table, the vast majority of the capacity additions in the grid in the 1995 – 1999 period were of the thermoelectric type.

RIO TAQUESI CDM PROJECT
BOLIVIAN INTERCONNECTED GRID
HISTORICAL CAPACITY ADDITIONS, PER DATE AND TYPE
(as of November 1999)

Date	Plant/unit	Capacity Added [MW]	Type	Company
Aug/Sep-96	Carrasco 1 and 2	111.90	Nat. gas	Valle Hermoso S.A.
Ene-97	Tiquimani	9.40	Hydro	COBEE S.A.
Sep-97	Zongo (enlargement)	5.90	Hydro	COBEE S.A.
Dic-97	Sta. Rosa (enlargement)	3.00	Hydro	COBEE S.A.
Sep-98	Cuticucho (enlargement)	12.70	Hydro	COBEE S.A.
Sep-98	Botijlaca (enlargement)	3.50	Hydro	COBEE S.A.
May-99	Guaracachi 9 and 10	119.70	Nat. gas	Guaracachi
May-99	Kanata	7.30	Hydro	SINERGYA S.A.
Jun-99	Huaji	30.00	Hydro	COBEE S.A.
Jun-00	BUL1	44.82	Nat. gas	CECBB
Jun-00	BUL2	44.82	Nat. gas	CECBB
May-01	KIL3	5.75	Hydro	EVH-Rio Electrico
May-01	LAN3	3.35	Hydro	EVH-Rio Electrico
May-04	SIS5	18.24	Hydro	Corani
Jul-06	SRO2	7.00	Hydro	COBEE S.A.
Jul-06	SRO1	10.50	Hydro	COBEE S.A.
Aug-06	ARJ9	1.60	Nat. gas	Guaracachi
Aug-06	ARJ10	1.60	Nat. gas	Guaracachi
Aug-06	ARJ11	1.60	Nat. gas	Guaracachi
Aug-06	ARJ12	1.60	Nat. gas	Guaracachi
Apr-07	GCH11	63.39	Nat. gas	Guaracachi
Oct-07	QHE2	0.98	Hydro	Quehata (SDB)
Oct-07	QHE1	0.98	Hydro	Quehata (SDB)
Oct-07	GBE1	16.00	Biomass	Guabira Energia
Aug-08	ARJ13	1.60	Nat. gas	Guaracachi
Aug-08	ARJ14	1.60	Nat. gas	Guaracachi
Aug-08	ARJ15	1.60	Nat. gas	Guaracachi
Aug-08	ANG3	3.00	Hydro	COBEE S.A.

Total		533.43		
Natural Gas		74.2%		
Outside current Regulation		12.7%		
Biomass		3.0%		

As seen in the table above, almost three quarters of all capacity additions came from natural gas – fueled plants. Of the hydroelectric investments, most of them (accounting for around 13% of all additions) were done by COBEE taking advantage of a legal framework different than that applicable to the Taquesi project. COBEE has operated in Bolivia for more than 80 years and their investments are not subjected to the marginal cost-based return, but to a guaranteed return calculated as a portion of their net assets. For them, the greater the assets the greater their guaranteed return, no matter how the market performs. Such a guaranteed return is not available to the Rio Taquesi project.

The SYNERGIA S.A.'s investment on the Kanata facilities and SDB's investment in the Quehata plant, by their size, can not be comparable to HB's Taquesi project.

If sub-steps 4a and 4b are satisfied, i.e. similar activities cannot be observed or similar activities are observed, but essential distinctions between the project activity and similar activities can reasonably be explained, please go to step 5 (Impact of CDM registration).

Sub-steps 4a and 4b are satisfied. The Rio Taquesi Hydroelectric Power Project activity does not represent common practice.

STEP 5: Impact of CDM registration

The financial benefit to the Project of the revenue obtained by selling CER's is significant. The primary benefit is that the cash flow benefit from revenue obtained from selling CER's increases the Project After Tax IRR to a point where it meets the benchmark set by Tenaska to invest in projects of this type in countries outside of the United States. Using the assumed amount of CER's created by the Project and the assumed future price paid for the CER's, the revenue obtained by selling the CER's increases the Project's total after tax cash flow by $77.4 million over the thirty-five (35) year Project life. The Project's after tax NPV @ 15% increases by $7.5 million.

B.6. Emission reductions:

B.6.1. Explanation of methodological choices:

The methodology used to estimate baseline emissions is applied as follows, with the methodological choices described at each point:

1. Calculation of the Emission Factor Operating Margin ($EF_{grid, OM, y}$) is done using the Dispatch Data Analysis, based on data on fuel consumption and net electricity generation of each power plant/ unit (Option C of the Tool to calculate the emission factor for an electricity system. Version 01, Annex 12 of EB 35 report). The main source of information is the Load Dispatch National Committee (CNDC by its short form in Spanish) whose objective is to manage the Wholesale Electrical Market in the National Interconnected Grid to assure reliability, security and

minimum cost. The Dispatch Data OM emission factor is the weighted average emission rate of the generating units at the top of the merit order that produce ten percent of total system generation, varying at each hour, accumulated for each hour and averaged over the hours of the year during which the Project operates. To determine this, it is to be obtained: i) the grid system dispatch order of operation (merit order) for all power plants; ii) the energy (MWh) dispatched from each plant during each hour that the Project activity is operating, and (iii) data necessary to calculate the emission factor for each unit in the system, mainly:

Variable/Factor	Data type	Data variable	Data unit	Source
1. $EG_{PJ, h}$	Electricity quantity	Electricity displaced by the Project activity in hour *h* of year *y*.	MWh	Project meters, CNDC
2. $EF_{grid, CM, y}$	Emission factor	Combined margin CO_2 emission factor for grid connected power generation	tCO_2 / MWh	Calculated
3. $EF_{grid, OM-DD, y}$	Emission factor	Operating margin CO_2 emission factor for grid connected power generation	tCO_2 / MWh	Calculated
4. $EF_{grid, BM, y}$	Emission factor	Build margin CO_2 emission factor for grid connected power generation	tCO_2 / MWh	Calculated
5. $FC_{i, m, y}$	Fuel quantity	Amount of each fossil fuel consumed by each power source / plant	Mass or volume	CNDC and calculated
6. $EF_{CO2, i, y}$	Emission factor coefficient	CO_2 emission factor of fossil fuel type *i* in year *y*	tCO_2 / GJ	IPCC, 2006
7. $EG_{m, n, h}$	Electricity quantity	Electricity generation of each power source / plant *m* or *n*, during *h* or *y*	MWh	CNDC
8.	Plant name	Identification of power source / plant for the OM and BM	Text	CNDC
9.	Merit order	The merit order in which power plants are dispatched	Text/spreadsheets	CNDC

The calculation requires hourly data for those hours when the Project produces electricity. The mean Operating Margin Emission Factor during the last twelve months (November 2007 to October 2008) is 0.64 t CO_2/MWh. See details in Annex 3, Table A2.

The formula used is:

$$EF_{grid,OM-DD,y} = \frac{\sum_{h} EG_{PJ,h} \times EF_{EL,DD,h}}{EG_{PJ,y}} \qquad (1)$$

Where: $EF_{grid,\ OM\text{-}DD,\ y}$ is the dispatch data analysis operating margin CO_2 emission factor in year y (tCO_2/MWh),
$EG_{PJ,\ h}$ is the electricity dispatched by the project activity in hour h of year y (MWh),
$EF_{EL,\ DD,\ h}$ is the CO_2 emission factor for the power units in the top of the dispatch order in hour h in year y (tCO_2/MWh),
$EG_{PJ,\ y}$ is the total electricity displaced by the project activity in year y (MWh),
h, refers to the hours in year y in which the project activity is displacing grid electricity
y, year in which the project activity is displacing grid electricity.

According to the methodology (Tool to calculate the emission factor for an electricity system. Version 01, annex 12 of EB 35 report) if hourly fuel consumption data is not available, then the hourly emissions factor is calculated based on the energy efficiency of the power unit and the type of fuel used, as follows:

$$EF_{EL,DD,h} = \frac{\sum_{n} EG_{n,h} \times EF_{EL,n,y}}{\sum_{n} EG_{n,h}} \qquad (2)$$

Where: $EF_{EL,\ DD,\ h}$ is the CO_2 emission factor for power units in the top of the dispatch order in hour *h in* year y (tCO_2/MWh),
$EG_{n,\ h}$ is the net energy generated and delivered to the grid by power unit n in hour h (MWh),
$EF_{EL,\ n,\ y}$ is the CO_2 emission factor of power unit *(n)* in year y (tCO_2/MWh),
n, power units in the top of the dispatch,
h, hours in year y in which the project activity is displacing grid electricity.

The CO_2 emission factor of the power units *(n)* should be determined as per the guidance for the simple OM method, using the options B1, B2 or B3. According to the data and parameters available in the Bolivian power system, option B1 is used to calculate the CO_2 emission factor ($EF_{EL,\ n,\ y}$).

Option B1. If for a power unit m data on fuel consumption and electricity generation is available, the emission factor ($EF_{EL,\ m,\ y}$) should be determined as follows:

$$EF_{EL,m,y} = \frac{\sum_i FC_{i,m,y} \times NCV_{i,y} \times EF_{CO2,i,y}}{EG_{m,y}} \qquad (3)$$

Where: $EF_{EL,m,y}$ is the CO_2 emission factor for power unit *m* in year *y* (tCO_2/MWh),
$FC_{i,m,y}$ is the amount of fossil fuel type *i* consumed by power unit *m* in year *y* (Mass or volume unit),
$NCV_{i,y}$ is the net calorific value (energy content) of fossil fuel type *i* in year *y* (GJ/mass or volume unit),
$EF_{CO2,I,y}$ is the CO_2 emission factor of fossil fuel type *i* in year *y* (tCO_2/GJ),
$EG_{m,y}$ is the net quantity of electricity generated and delivered to the grid by power unit *m* in year *y* (MWh),
m, all power units serving the grid in year *y* except low-cost / must-run power units
i, all fossil fuel types combusted in power unit *m* in year *y*,
y, either the three most recent years for which data is available at the time of submission of the CDM-PDD to the DOE for validation (ex ante option) or the applicable year during monitoring (ex post option), following the guidance on data vintage in step 2 of the baseline methodology procedure.

In this case *"m"* is replaced by *"n"*, in order to apply it in the dispatch data analysis OM method.

To determine the set of plants *(n)*, the CNDC provides: a) the grid system dispatch order of operation for each power plant of the system; and b) the energy (MWh) dispatched from all plants in the system during every hour that the Project is operating (EG_h). Every hour *h*, each plant's generation (EG_h) is stacked using merit order. The group of power units *n* in the dispatch margin includes the units in the top x% of total electricity dispatched in the hour *h*, where x% is equal to the greater of either: (a) 10%; or (b) The quantity of electricity displaced by the project activity during hour *h* divided by the total electricity generation in the grid during that hour *h*.

2. Calculation of the Build Margin Emission Factor ($EF_{grid,BM,y}$). In the second crediting period, the ex-ante approach will be used for calculating the Build Margin emission factor based on the most recent information available on plants already built. The group used consists of those power plants whose capacity additions represent the 20% of the total system generation (in MWh). In the case of the Bolivian power system, the generation of the five power plants that have been built most recently is lower than the injections of those capacity additions in the electricity system that comprise 20% of the system's annual energy. The resulting $EF_{grid,BM,y}$, is 0.60 tCO_2/MWh for the period from November 2007 to October 2008. See details in Annex 3, Table A3 and Table A4.

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

$$EF_{grid,BM,y} = \frac{\sum_m EG_{m,y} \times EF_{EL,m,y}}{\sum_m EG_{m,y}} \qquad (4)$$

Where: $EF_{grid, BM, y}$ is the build margin CO_2 emission factor in year y (tCO_2/MWh),
$EG_{m, y}$ is the net quantity of electricity generated and delivered to the grid by power unit in year y (MWh),
$EF_{EL, m, y}$ is the CO_2 emission factor of power unit m in year y (tCO_2/MWh),
m, refers to the power units included in the build margin,
y, most recent historical year for which power generation data is available

The CO_2 emission factor of each power unit m ($EF_{EL, m, y}$) should be determined as per the guidance for the simple OM method of operating margin emission factor, with options B1, B2 and B3, using for y the most recent historical year for which power generation data is available, using for m the power units included in the build margin.

3. Calculation of the Combined Margin Emission Factor ($EF_{grid, CM, y}$). The Combination Margin Emission Factor (or the Baseline Emission Factor as indicated in the older Version 06) is calculated as follows:

$$\boxed{EF_{grid,CM,y} = (EF_{grid,OM,y} \times w_{OM}) + (EF_{grid,BM,y} \times w_{BM})} \qquad (5)$$

Where: w_{OM} *is* the weighting of Operating Margin Emission Factor (%),
w_{BM} is the weighting of Build Margin Emission Factor (%),
$EF_{grid, OM, y}$ and $EF_{grid, BM, y}$ is described and calculated as portray in the corresponding steps above and expressed in tCO_2/MWh.

In the second crediting period, the next weights will be used: $w_{OM} = 25\%$ and $w_{BM} = 75\%$ *(i.e.,* $w_{OM} = 0.25$ and $w_{BM} = 0.75$*)*

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

Information on the data and parameters that are not monitored throughout the crediting period but are determined only once and remains fixed throughout the crediting period and that are currently available is the following:

Data / Parameter:	**$C0_2$ to Carbon (C) molecular weight ratio**
Data unit:	tCO_2/TC per CO_2 mass unit
Description:	Relation between CO_2 and C molecular masses in a CO_2 molecule
Source of data used:	Periodic table for chemical elements
Value applied:	3.666… = 44/12
Justification of the choice of data or description of measurement methods and procedures actually applied :	Carbon content is available in mass of C emitted per unit of energy produced by combustion of the selected fuel, and emissions are in the form of CO_2, thus a conversion from C to CO_2 is required.

Any comment:	No measurement methods are needed.

Data / Parameter:	**$EF_{grid,BM,y}$**
Data unit:	tCO_2/MWh
Description:	Build Margin CO_2 emission factor for grid connected power generation in year *y*
Source of data used:	CNDC's monthly reports and IPCC 2006
Value applied:	Please refer to Annex 3
Justification of the choice of data or description of measurement methods and procedures actually applied :	According to the Methodological Tool (version 01.1), for the second Crediting Period, the Build Margin emission factor is calculated *ex-ante*, based on the most recent information available on units already built for a sample group *m* at the time of CDM-PDD submission for validation. This calculation conforms the requirements of the methodology as described in point 2 of section B.6.1.
Any comment:	

Data / Parameter:	**$EF_{CO2,i,y}$**
Data unit:	tCO_2/BTU
Description:	CO_2 emission factor per unit of energy of the fuel type *i* in year *y* for the Build Margin
Source of data used:	IPCC 2006
Value applied:	Natural Gas: 5.72E-08 [tCO_2/BTU] Diesel Oil: 7.66E-08 [tCO_2/BTU]
Justification of the choice of data or description of measurement methods and procedures actually applied :	IPCC data is acceptable and no values are available in regional or national energy statistic/energy balances nor are collected from power plant operators.
Any comment:	The CO_2 emission factor per unit of energy of the fuel type *i* in year *y* can vary for the Operating Margin, which will be estimated ex-post, but will not change for the Build Margin, which is to be maintained unchanged during the second Crediting Period

B.6.3. Ex-ante calculation of emission reductions:

Emissions reductions due to the project activity are calculated according to the following equation:

$$ER_y = BE_y - PE_y - L_y \qquad (6)$$

Where:

ER_y = Emissions reductions [t CO_2-e]
BE_y = Baseline emissions reductions [t CO_2-e]
PE_y = Emissions by sources within the activity [t CO_2-e]
L_y = Leakages [t CO_2-e]

Since the Rio Taquesi Hydroelectric Power Project is a hydropower run-of-river project, it does not give rise to direct GHG emissions. Therefore, no estimation of direct emissions is provided here and PE_y equals to zero. Likewise, no leakage is associated to the Project and L_y is also null.

The baseline emissions reductions per year are calculated using the equation:

$$ER_y = BE_y = EF_y \times EG_y \qquad (7)$$

The outline of the method to calculate the ERs is as follows:

Determination of Baseline Emission Factor
(tCO_2/MWh)

↓

Monitoring annual generation output from the Project
(MWh)

↓

Calculation of Emission Reductions generated by the Project using the formula:

"*annual electricity dispatched to the grid times baseline emission factor*"
(t CO_2)

The mean annual generation for the crediting period is circa 309,000 MWh. The mean baseline emission rate for the 7-year crediting period is 0.61 t CO_2/MWh (See Annex 3 for details and calculations.)

The net annual reductions for the period July 1, 2009 to June 30, 2010 and following 12-month periods are estimated to be more than 188 thousands of tCO_2-e (See Annex 3 for details and calculations.)

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

For the Grid Factor, please go to Annex 3.

The tables summarizing calculations for the Taquesi complex as stated in paragraphs above is the following:

CHOJLLA POWER PLANT

Crediting Year	Estimation of project activity emission reductions (tonnes of CO_2 e)	Estimation of baseline emission reductions (tonnes of CO_2 e)	Estimation of leakage (tonnes of CO_2 e)	Estimation of emission reductions (tonnes of CO_2 e)
Year 1 (July 1, 2009-June 30, 2010)	0	66,290	0	66,290
Year 2 (July 1, 2010-June 30, 2011)	0	66,290	0	66,290
Year 3 (July 1, 2011-June 30, 2012)	0	66,472	0	66,472
Year 4 (July 1, 2012-June 30, 2013)	0	66,290	0	66,290
Year 5 (July 1, 2013-June 30, 2014)	0	66,290	0	66,290
Year 6 (July 1, 2014-June 30, 2015)	0	66,290	0	66,290
Year 7 (July 1, 2015-June 30, 2016)	0	66,472	0	66,472
Total estimated reductions	0	464,394	0	464,394

YANACACHI NORTE POWER PLANT

Crediting Year	Estimation of project activity emission reductions (tonnes of CO_2 e)	Estimation of baseline emission reductions (tonnes of CO_2 e)	Estimation of leakage (tonnes of CO_2 e)	Estimation of emission reductions (tonnes of CO_2 e)
Year 1 (July 1, 2009-June 30, 2010)	0	122,195	0	122,195
Year 2 (July 1, 2010-June 30, 2011)	0	122,195	0	122,195
Year 3 (July 1, 2011-June 30, 2012)	0	122,529	0	122,529
Year 4 (July 1, 2012-June 30, 2013)	0	122,195	0	122,195
Year 5 (July 1, 2013-June 30, 2014)	0	122,195	0	122,195
Year 6 (July 1, 2014-June 30, 2015)	0	122,195	0	122,195
Year 7 (July 1, 2015-June 30, 2016)	0	122,529	0	122,529
Total estimated reductions	0	856,033	0	856,033

ALL TAQUESI SYSTEM

Crediting Year	Estimation of project activity emission reductions (tonnes of CO_2 e)	Estimation of baseline emission reductions (tonnes of CO_2 e)	Estimation of leakage (tonnes of CO_2 e)	Estimation of emission reductions (tonnes of CO_2 e)
Year 1 (July 1, 2009-June 30, 2010)	0	188,485	0	188,485
Year 2 (July 1, 2010-June 30, 2011)	0	188,485	0	188,485
Year 3 (July 1, 2011-June 30, 2012)	0	189,001	0	189,001
Year 4 (July 1, 2012-June 30, 2013)	0	188,485	0	188,485
Year 5 (July 1, 2013-June 30, 2014)	0	188,485	0	188,485
Year 6 (July 1, 2014-June 30, 2015)	0	188,485	0	188,485
Year 7 (July 1, 2015-June 30, 2016)	0	189,001	0	189,001
Total estimated reductions	0	1,320,427	0	1,320,427

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

B.7.1 Data and parameters monitored:

(Copy this table for each data and parameter)

Data / Parameter:	**$EG_{PJ, h}$**
Data unit:	MWh
Description:	Electricity displaced by the Project activity in hour *h* of year *y*
Source of data to be used:	HB's metering system at Pichu substation and Chojlla Antigua, which provide records for HB's units' production, useful for discriminating the Project injections from the total injections of HB (i.e. removing injections not accrued as part of the CDM activity). CNDC's monthly SMEC records (CNDC is the Spanish acronym for National Load Dispatch Committee or the National Interconnected Grid Administrator; SMEC accounts for Commercial Metering System from which sales reports are done by the CNDC), used in estimating Project's injections to the commercial grid.
Value of data applied for the purpose of calculating expected emission reductions in section B.5	300,563 [MWh] (for the period Nov 2007 – Oct 2008)
Description of measurement methods	HB's injections at node of the Trunk Integrated Grid for HB, where its billing is referred to, are measured through the Commercial Recording System, a meters'

and procedures to be applied:	system remotely accessed from HB's and CNDC's premises. This data is hourly measured and monthly recorded. Project's deliveries at Pichu substation is measured through HB's own metering system and used to deduct from measurement records at node of the Trunk Integrated Grid, the injections of HB's non-Project's sources following the procedure described below: 1. Project's energy measured at Pichu through HB's metering system is affected by the transmission losses between the plants and Pichu to obtain the Project's gross production 2. Chojlla Antigua (HB's non-Project power source) gross production measured at generator's terminals through HB's metering system is added to the result above 3. Project's gross production is divided by the total gross production above to get the proportion of Project's generation of the total injections 4. The above proportion is applied to node of the Trunk Integrated Grid records from monthly SMEC for getting the Project's injection at node of the Trunk Integrated Grid (EG)
QA/QC procedures to be applied:	Double check by audit of sales receipt. Sales are calculated by the CNDC and reported in the Monthly Economic Transactions Report (DTE by its acronym in Spanish). The Project's metering system complies with technical specifications and CNDC standards. Registered information is compared to the information on the DTE. To prevent the use of energy from Chojlla Antigua for the emission reduction calculations, Project injections should be lower than those resulting from the energy balance done with monthly SMEC's data to calculate HB's chargeable energy (for the periods in which Chojlla Antigua effectively injects power to the grid).
Any comment:	Monthly SMEC records are available at CNDC's web page or on request. Although for the period Nov 2007 – Oct 2008 Pichu substation meters records were used to estimate the injections of HB's non-Project plant (Chojlla Antigua), during the second crediting period new HB's Generator Terminal meters already installed and commissioned will be used for the same purpose.

Data / Parameter:	$\mathbf{EG_{m/n/,\,y}}$
Data unit:	MWh
Description:	Net electricity generated and delivered to the grid by power plant / unit *m* or *n* in year *y* or hour *h*
Source of data to be used:	CNDC's Daily Transactions report (DTr) or Post-dispatch report for dispatched fossil-fueled thermoelectric power unit's injections and monthly SMEC records for injections of sets of units of hydroelectric plants.
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Refer to Tables A2 and A3, Annex 3
Description of measurement methods and procedures to be	Measurement of energy injected by sets of units in a given plant is done through the Commercial Recording System (SMEC), a meters' system remotely accessed from the CNDC premises.

applied:	Energy injections per generating unit are available at CNDC's DTrs. The DTr provides the individual estimated energy of each thermal power source and it is used to determine the generation delivered to the grid by each thermal source according the CNDC's monthly SMEC registries. For OM, the data is hourly measured and monthly recording. For BM, in the second crediting period, only once *ex-ante* at the start of the second crediting period and yearly recorded.
QA/QC procedures to be applied:	Commercial metering and recording of generation is utilized. The QA/QC procedures consist of verifying whether the data is used by the CNDC for transactional purposes related to the electricity market.
Any comment:	Monthly SMEC records are available at CNDC's web page or on request

Data / Parameter:	**$FC_{i, m/n, y}$**
Data unit:	ft^3 or l for natural gas and diesel, respectively
Description:	Amount of fossil fuel type *i* consumed by power plant/ unit *m* or *n* in year *y* or hour *h*.
Source of data to be used:	▪ SoE's (Superintendence of Electricity) ISE (Power Sector Information system) provides information on periodic – monthly and annual – fuel consumption by the thermoelectric plants and type of fuel by plant ▪ Monthly SMEC records for injections information
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Please refer to Tables 2 and 3 , Annex 3
Description of measurement methods and procedures to be applied:	This data is calculated based in each generation thermal unit and the fuel consumption of each thermoelectric plant. For OM, the data is monitored monthly and recorded yearly. For BM, in the second crediting period, only once *ex-ante* at the start of the second crediting period and yearly recorded.
QA/QC procedures to be applied:	Official information made available by SoE's ISE reports is used. CNDC's reports are used for comparison ends only.
Any comment:	Calculation of power *unit* emission factors, as per equation (3). The ISE of the SoE is published each October or November, via statistical yearbooks which contains the information of the last year. The report of the natural gas consumption is published monthly on the website of the CNDC

Data / Parameter:	**MERIT ORDER**
Data unit:	This parameter does not have dimensions or units
Description:	The merit order in which power plants are dispatched
Source of data to be used:	CNDC's Daily Transactions report (DTr) or Post-dispatch report
Value of data applied for the purpose of calculating expected emission reductions in	This value varies normally on an hourly basis

section B.5	
Description of measurement methods and procedures to be applied:	The merit order results from arranging all dispatched units in accordance to its marginal cost (which is at its time a combination of the heat rate, the fuel cost and the Operation & Maintenance non-fuel costs of the Units), decreasingly. For OM, merit order lists are registered hourly and recorded monthly.
QA/QC procedures to be applied:	Only official information made available by CNDC has been used.
Any comment:	CNDC establishes the merit order using models available to all agents of the power market. DTr are available from CNDC's web page and upon request.

Data / Parameter:	**$EG_{n/m/,y\ IMPORTS}$**
Data unit:	MWh
Description:	Electricity imports to the Project electricity system
Source of data to be used:	CNDC
Value of data applied for the purpose of calculating expected emission reductions in section B.5	0
Description of measurement methods and procedures to be applied:	If an interconnection to foreign grids occurs in the future, measurement will be done through the Commercial Recording System and will be available from the CNDC in accordance to the applicable Imports/Exports Regulation. Superintendence of Electricity accomplishes the function of regulating the activities of the national electric industry, and has authority to approve electricity imports. This data will be monthly measured and yearly recorded.
QA/QC procedures to be applied:	Commercial metering and recording of generation will be utilized. The QA/QC procedures will mainly consist of verifying whether the data is used by the CNDC for transactional purposes related to the electricity market.
Any comment:	No imports occur so far because there are no international links. No such a links are under development either.

Data / Parameter:	**NCV_i**
Data unit:	Natural Gas: BTU/ft^3 Diesel oil: BTU/l
Description:	Net calorific value (energy content) of fossil type *i* in year *y*
Source of data to be used:	The following data source may be used if the relevant conditions apply:

Data source	**Conditions for using the data source**
Values provided by the fuel supplier of the power plants in invoices	If data is collected from power plant operator (e.g. utilities)
Regional or national average	If values are reliable and documented in

	default values — regional or national energy statistic/energy balances IPCC default values at the lower limit of the uncertainty at a 95% confidence interval as provided in Table 1.2 of Chapter 1 of Vo. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories For the Project the first option is used, since CNDC collects the information.
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Natural gas: Plant — NCV Guaracachi — 960 BTU/ ft^3 Karachipampa — 976 BTU/ ft^3 Aranjuez — 976 BTU/ ft^3 V. Hermoso — 945 BTU/ ft^3 Carrasco — 915 BTU/ ft^3 Kenko — 945 BTU/ ft^3 Bulo Bulo — 926 BTU/ ft^3 Diesel oil: — 33,710 BTU/l
Description of measurement methods and procedures to be applied:	Comes from monthly information reported in the CNDC's web page. For OM, the data is monthly monitored and yearly recorded. For BM, in the second crediting period, only once *ex-ante* at the start of the second crediting period and yearly recorded.
QA/QC procedures to be applied:	Only official information made available by the CNDC is used.
Any comment:	Calculation of power *unit* emission factors, as per equation (3). Data above is given only as an example and is valid just for November 2007. NCV can vary depending on the quality and properties of the fuel. All values adopted for every fuel/plant are available at CNDC's webpage or on request.

Data / Parameter:	$\mathbf{EF_{CO2,i,y}}$
Data unit:	tCO_2/BTU
Description:	CO_2 emission factor per unit of energy of the fuel type *i* in year *y*
Source of data to be used:	The following data source may be used if the relevant conditions apply: **Data source** — **Conditions for using the data source** Values provided by the fuel supplier of the power plants in invoices — If data is collected from power plant operator (e.g. utilities) Regional or national average default values — If values are reliable and documented in regional or national energy statistic/energy balances IPCC default values at the lower —

	limit of the uncertainty at a 95% confidence interval as provided in Table 1.4 of Chapter 1 of Vo. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories For the Project the last option is used
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Natural Gas: 5.72E-08 [tCO_2/BTU] Diesel Oil: 7.66E-08 [tCO_2/BTU]
Description of measurement methods and procedures to be applied:	Calculated from carbon contents (made available by IPCC, 2006 Guidelines), conversion factor between Joule and BTU and relation of molecular masses of Carbon and Carbon Dioxide. For OM, the data is yearly monitored and yearly recorded. For BM, in the second crediting period, only once *ex-ante* at the star of the second crediting period and yearly recorded.
QA/QC procedures to be applied:	Only information from IPCC, 2006 is used
Any comment:	No local emission studies' results for the purpose are available

Data / Parameter:	**Plant (unit) name**
Data unit:	Text – does not have units
Description:	Identification of power source / plant for the Operating and Build Margins
Source of data to be used:	CNDC's DTr and DTE
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Various
Description of measurement methods and procedures to be applied:	No measurement is applicable. Determination of power sources is done following the merit order identification process. This data is recorded yearly and kept archived during the crediting period and beyond.
QA/QC procedures to be applied:	Only official information made available by the CNDC is used
Any comment:	

Data / Parameter:	**$EF_{grid,CM,y}$**
Data unit:	tCO_2/MWh
Description:	Combined margin CO_2 emission factor for grid connected power generation in year *y* calculated using the version 01.1 of the "Tool to calculate the emission

	factor for an electricity system".
Source of data to be used:	As per the "Tool to calculate the emission factor for an electricity system, version 01.1."
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Please refer to Tables 2 and 3 , Annex 3
Description of measurement methods and procedures to be applied:	As per the "Tool to calculate the emission factor for an electricity system, version 01.1".
QA/QC procedures to be applied:	The data can be cross checked with the baseline emissions calculation files
Any comment:	

B.7.2. Description of the monitoring plan:

The monitoring methodology used enables the Project participants to rely exclusively on data and information, as described in B.6.1 that is publicly available from the CNDC in Bolivia. The essential information to be monitored includes metering records, hourly generation of each unit in the system, and total fuel consumption for all fossil fuel fired generation plants within the system. A brief description of the process is illustrated in annex 4.

The required data is compiled and archived by the CNDC and will be transferred to the Project participants for duplicate archival storage. Contrasts of HB's own meters is done periodically since the main meters are also revenue meters and have to comply with CNDC approved standards.

The data listed in B.6.1 is sufficient to estimate emissions occurring within the Project boundary, determine the baseline, and identify increased emissions outside the Project boundary in the event that transmission facilities are constructed in the future that would enable imports or exports from the grid system.

The instructions in the approved monitoring methodology will be followed and reported periodically in a formal Monitoring Report.

Data monitored and required for verification and issuance will be kept for a minimum of two years after the end of the crediting period or the last issuance of CERs for this Project activity, whichever occurs later.

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):

Date of completion: 12/Dec/2008

Responsible Person: Ricardo Michel, Hidroeléctrica Boliviana S.A. (rmichel@hidrobol.com)
Hidroeléctrica Boliviana S.A. is a Project Participant.

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:

Starting date of the Project activity is 28/01/2000. This is the date of the Authorization to Proceed for the Engineering, Procurement and Construction contract related to this Project activity. See Annex 5 for documentation.

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

Expected operational lifetime of the Taquesi Project is thirty five (35) years and zero (0) months.

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

C.2.1. Renewable crediting period:

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

The first renewable Crediting Period has started on July 1, 2002.
The second renewable Crediting Period will start on July 1, 2009

C.2.1.2. Length of the first crediting period:

The first and subsequent crediting periods are 7-year length.

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 Rio Taquesi Hydroelectric Power Project was granted with an Environmental License (number 021103-05-DIA-002-98) issued in 1998 by the competent environmental agency, the Environmental and Natural Resources Unit within the Prefecture of La Paz. Please see it attached in Annex 7. No transboundary treatment is required. The DIA (Declaratoria de Impacto Ambiental) is the Environmental License established by Law for project activities starting after the said Law entered into force (1992). The DIA is valid for ten years, hence a renewed DIA has been granted for the Project in August 2008 after following the procedural requirements applicable.

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:

Although the environmental impacts were considered rather insignificant, the Agency requested an Environmental Impact Assessment process. Environmental impacts were identified and recorded in the following documents:

- Environmental Screening. This document is a compulsory part of the process of obtaining an Environmental License – obligatory also for any new Project or activity. The main objective of this document is to identify the environmental impacts during the Design Stage and determine whether they are significant or not. Based on this document, the environmental authorities conduct an assessment process, in order to classify the Project for purposes of the Environmental Impact Statement.

- Environmental Impact Assessment. This document has the principal objective of assessing the level of environmental impacts and includes the Prevention and Mitigation Plan (PPM) and the Environmental Adequation and Monitoring Plan

- Environmental Monitoring. Periodic inspections are performed to assure that the requirements of the PPM (Prevention and Mitigation Plan) and PASA (Environmental Plan) have been fulfilled.

Annex 6 includes an Executive Summary of the Environmental Impact Assessment with a summarized description of environmental impacts, the mitigation measures prescribed for them, and the evaluation methodologies associated with them. Annex 7 includes the original and updated Environmental Licenses granted by the Prefecture of La Paz.

From the earliest stages of Project development, regional stakeholders and the affected communities were advised and consulted about the Project. Numerous meeting were held with affected parties and communities and local leaders were involved in many aspects of the Project. No significant objection to the Project was encountered.

Significant environmental impacts were avoided in Project design and implementation, and much care was taken to mitigate any impacts that did result. Monitoring protocols were established and are being carried out in accordance with established regulations. Most impacts were related to the construction stage, and all were considered insignificant.

The construction and operation of the Project does not have a significant impact on the watershed, but rather provides considerable economic opportunity to the region's inhabitants.

SECTION E. Stakeholders' comments

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

From the inception of the Project activity, there has been strong stakeholder involvement. Meetings have been held in each of the communities within the Project area, to discuss the Project's objectives and scope, answer questions, and invite comments and suggestions. Some of these interactions were part of the permitting process and involved governmental entities, while others were sponsored and coordinated by the Project company. The local stakeholders consultation process ended in 2003.

E.2. Summary of the comments received:

Some meetings were quite well attended, with as many as 250 attendees. Stakeholder comments in several cases led to alterations and adjustments in Project development. In one case, interactions with stakeholders led to a cooperative effort to relocate a cemetery, the relocation being provided by the local residents and the expenses and improvements paid by the Project company. In another instance, there were consultations by the governmental authority (Prefecture of La Paz) with farmer's downstream of the Project regarding river flows and possible impacts. There were many interactions with stakeholders along transmission line routes. An outgrowth of this interaction and a commitment on the part of the Project company to the long-term well being of the region was the formation of a foundation whose mission is to provide improvements to the region and its inhabitants.

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

Meetings were held in which minutes were kept, and in some cases a negotiation process ensued in which agreements were developed and signed obligating the signatories to certain deliverables and actions. In the case of transmission line routing, for example, agreements were negotiated with the landowners and farmers along the path of the transmission line,. The process was supervised by the environmental unit of the "Prefectura de La Paz". Finally, the agreements were notarized and became the basis for compensation to affected landowners along the transmission rights of way.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Organization:	HIDROELECTRICA BOLIVIANA S.A.
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Represented by:	
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Building:	
City:	La Paz
State/Region:	La Paz
Postfix/ZIP:	
Country:	Bolivia
Telephone:	591-2 2116000
FAX:	591-2 2116000 ext. 1215
E-Mail:	
URL:	
Represented by:	
Title:	Vice Minister of Land Planning and Environment
Salutation:	Mr.
Last Name:	John
Middle Name:	
First Name:	Vargas
Department:	Vice Ministry
Mobile:	

Direct FAX:	591-2-2312522
Direct tel:	592-2-2312522
Personal E-Mail:	

Organization:	C-Trade Comercializadora de Carbono Ltda.
Street/P.O.Box:	Praia de Botafogo 501
Building:	Torre Corcovado, 2 andar
City:	Rio de Janeiro
State/Region:	Rio de Janeiro
Postfix/ZIP:	CEP 22250-040
Country:	Brazil
Telephone:	55-21-2546-9845
FAX:	55-21-2586-6002
E-Mail:	
URL:	
Represented by:	
Title:	Business Development Manager
Salutation:	Mr.
Last Name:	Furini
Middle Name:	
First Name:	Gustavo
Department:	
Mobile:	
Direct FAX:	
Direct tel:	55-21-7515-8467
Personal E-Mail:	gfurini@c-trade.com

Organization:	Corporación Andina de Fomento CAF
Street/P.O.BOX:	Av. Luis Roche, Altamira
Building:	Torre CAF
City:	Caracas
State/Region:	Distrito Federal
Postfix/ZIP:	69011
Country:	Venezuela
Telephone:	58 212 2092407
FAX:	58 212 2092406
E-Mail:	mtorres@caf.com
URL:	www.caf.com
Represented by:	
Title:	Head of the PLAC
Title:	Ms
Last Name:	Torres
Middle Name:	
First Name:	Mary

Department:	Environment Direction
Mobile:	
Direct FAX:	(571) 313 27 21/87
Direct tel:	(571) 313 23 11
Personal E-Mail:	mtorres@caf.com

Organization:	Ministry of Housing, Spatial Planning and Environment (VROM)
Street/P.O.Box:	PO Box 30945
Building:	
City:	Den Haag
State/Region:	
Postfix/ZIP:	2500 GX
Country:	The Netherlands
Telephone:	+ 31 70 3394693
FAX:	+ 31 70 3391306
E-Mail:	
URL:	www.minvrom.nl
Represented by:	
Title:	Head of Clean Development Mechanism Division
Salutation:	Mr
Last Name:	De Jonge
Middle Name:	
First Name:	Lex
Department:	Directorate General for Environmental Protection
Mobile:	
Direct FAX:	+ 31 70 3391306
Direct tel:	+ 31 70 3394693
Personal E-Mail:	Lex.dejonge@minvrom.nl

Organization:	TENASKA INTERNATIONAL ENERGY LLC
Street/P.O.BOX:	South Church Street, PO BOX 309GT
Building:	Ugland House
City:	George Town
State/Region:	Grand Cayman
Postfix/ZIP:	
Country:	Cayman Islands, British West Indies
Telephone:	(345) 949-8066
FAX:	(345) 949-8080
E-Mail:	
URL:	
Represented by:	Gregory Kunkel
Title:	Vice-President

Title:	
Last Name:	Kunkel
Middle Name:	
First Name:	Gregory
Department:	Engineering
Mobile:	(402) 968-3394
Direct FAX:	(402) 691-9530
Direct tel:	(402) 691-9500
Personal E-Mail:	gkunkel@tenaska.com

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

NO PUBLIC FUNDING HAS BEEN PROVIDED FOR THE RIO TAQUESI HYDROELECTRIC POWER PROJECT

Annex 3

BASELINE INFORMATION

TABLE A1. Specific Values

Fuel	*i*	*Convertion Factor* [TJoule/BTU]	*Carbon Content* [tC/TJoule]	*44/12* [tCO2/tC]	*EFCO2,i : Emissions Factor* [tCO2/BTU]	*EFCO2,i : Emissions Factor* [tCO2/TJoule]	*EFCO2,i : Emissions Factor* [tCO2/GJoule]
Natural Gas	NG	1.0548E-09	14.8	3.6667	5.72E-08	5.43E+01	5.43E-02
Diesel Oil	DO	1.0548E-09	19.8	3.6667	7.66E-08	7.26E+01	7.26E-02

TABLE A2. Operating Margin

		D	E	F	G	H	I	J	K	L	M
Year	Period	Generation GWh			Fuel Consumption		Emissions Top x% tCO2		Emissions Factor Top x% tCO2/MWh	Emissions tCO2	**OM Emissions Factor tCO2/MWh**
					MFt3	k Lt					
y			$\sum GEN_{10\%,h}$	$EG_{PJ,y}$	$FC_{i,n,y}$	$FC_{i,n,y}$	$\sum EF_{EL,m,y} \cdot EG_{n,h}$		$EF_{EL,DD,h}$	$EG_{PJ,h} \cdot EF_{EL,DD,h}$	$EG_{PJ,h} \cdot EF_{EL,DD,h} / EG_{PJ,y}$
		Tot Gen SIN	*n ≥ Top 10%*	*Project*	*i = NG*	*i = DO*	*i = NG*	*i = DO*			
									=(I+J)/E		=(L/F)/1000
1	nov/07 - oct/08	5,191.9	694.6	300.56	32,614	194.66	447,382	498.74	644.771	191,315.32	0.64
Total		5,191.9	694.6	300.56	32,614	194.66	447,382	498.74	644.771	191,315.32	0.64

TABLE A3. Build Margin, Second Crediting Period "ex ante". Additions represents 20% of the system generation

			N	O	P	Q	R	S	T	U	V
	Starting Year	Type	Generation GWh	Fuel Consumption MMFt3	Net Cal Value BTU/Ft3	Conver Factor TJ/BTU	Fuel Consumption TJ	Carbon Content tC/TJ	tCO2/tC	Emissions tCO2/TJ	**BM Emission Factor tCO2/MWh**
											$(\sum EG_{m,y} \cdot EF_{EL,m,y}) / \sum EG_{m,y}$
							=(O*P*Q*1000000)	IPCC, 2006		=(S*T)	=(R*U/N)/1000
ARJ13	Aug/2008	Nat Gas	2.01	22.35	977.87	1.0548E-09	23.05	14.80	3.67	54.27	0.62
ARJ14	Aug/2008	Nat Gas	2.56	27.66	977.87	1.0548E-09	28.53	14.80	3.67	54.27	0.61
ARJ15	Aug/2008	Nat Gas	1.75	18.37	977.87	1.0548E-09	18.95	14.80	3.67	54.27	0.59
ANG3	Aug/2008	Hydro	1.83								
GBE1	Oct/2007	Biomas	39.40								
QHE2	Oct/2007	Hydro	1.64								
QHE1	Oct/2007	Hydro	1.64								
GCH11	Apr/2007	Nat Gas	370.41	4,315.42	960.99	1.0548E-09	4,374.34	14.80	3.67	54.27	0.64
ARJ9	Aug/2006	Nat Gas	10.30	113.71	977.87	1.0548E-09	117.29	14.80	3.67	54.27	0.62
ARJ10	Aug/2006	Nat Gas	10.40	115.19	977.87	1.0548E-09	118.81	14.80	3.67	54.27	0.62
ARJ11	Aug/2006	Nat Gas	10.28	113.93	977.87	1.0548E-09	117.52	14.80	3.67	54.27	0.62
ARJ12	Aug/2006	Nat Gas	7.67	85.76	977.87	1.0548E-09	88.46	14.80	3.67	54.27	0.63
SRO2	Jul/2006	Hydro	30.78								
SRO1	Jul/2006	Hydro	34.69								
SIS5	May/2004	Hydro	116.62								
LAN3	Mar/2001	Hydro	10.18								
KIL3	Mar/2001	Hydro	18.00								
BUL1	Jun/2000	Nat Gas	312.34	3,021.09	926.20	1.0548E-09	2,951.48	14.80	3.67	54.27	0.51
BUL2	Jun/2000	Nat Gas	300.75	2,909.38	926.20	1.0548E-09	2,842.35	14.80	3.67	54.27	0.51
Total			**1,283.3**	**10,742.86**			**10,680.78**				
Rate m≥20%			**24.7%**								
Build Margin Emission Factor Average											**0.60**

TABLE A4. Baseline Emissions Factor

		W	X	Y	Z	AA
Year	Period	Emissions Factor [tCO2/MWh]		Weights [p.u.]		Baseline Emissions Factor [tCO2/MWh]
y		$EF_{OM,DD,y}$	$EF_{BM,y}$	w_{OM}	w_{BM}	*EFy*
		Operation	Build	Operation	Build	
1	jul/09 - jun/16	0.64	0.60	0.25	0.75	0.61
Average						0.61

TABLE A5. Total Emissions Reductions

	AB	AC	AD	AE	AF	AG
Period	Lifetime [years]	Capacity [MW]	Generation [GWh]	Capacity Factor [%]	Baseline Emissions Factor [tCO2/MWh]	Total Emissions Reductions [tCO2]
jul/09 - jun/10	1.00	89.50	308.99	39.4%	0.61	188,485
jul/10 - jun/11	1.00	89.50	308.99	39.4%	0.61	188,485
jul/11 - jun/12	1.00	89.50	309.84	39.5%	0.61	189,001
jul/12 - jun/13	1.00	89.50	308.99	39.4%	0.61	188,485
jul/13 - jun/14	1.00	89.50	308.99	39.4%	0.61	188,485
jul/14 - jun/15	1.00	89.50	308.99	39.4%	0.61	188,485
jul/15 - jun/16	1.00	89.50	309.84	39.5%	0.61	189,001
Average Forecast 7-years Crediting Period: July 1, 2009 June 30, 2016		89.50	309.23	39.4%	0.61	188,632

Annex 4

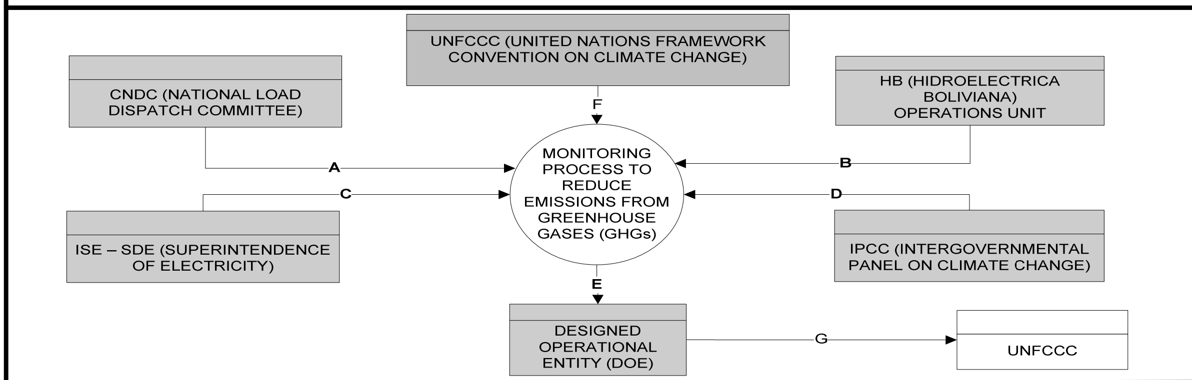
MONITORING PLAN

Brief description of the Monitoring and Calculation Process

HIDROELECTRICA BOLIVIANA S.A.	PROCESS No: 01a	CODE: P-CO-01a	SUB SYSTEM: CONTROL	PAGE No: 1 OF 1
	RESPONSIBLE: Market and Development Management		VER 2 ENGLISH VERSION REVISION: May – 2009 BY: MAM/PDD SP	

CONTEXT DIAGRAM - DFD

ORGANIZATION AND SYSTEMS UNIT



DESCRIPTION OF INFORMATION - INPUTS

A: CNDC INFORMATION:
- $EG_{PJ,h}$ = Electricity displaced by the project activity in hour *h* of year *y.* [MWh] – SMEC (COMMERCIAL METERING SYSTEM) FROM CNDC
- $EG_{PJ,y}$ = Total electricity displaced by the project activity in year *y.* [MWh] – SMEC (COMMERCIAL METERING SYSTEM) FROM CNDC
- $EG_{m/n,y}$ = Net electricity generated and delivered to the grid by power plant/unit *m* or *n* in year *y* or hour *h.* [MWh] – SMEC y POST DISPATCH FROM CNDC
- M.O = Merit Order in which power plants are dispatched (less thermal cost) – POST POST DISPATCH FROM CNDC
- $NCV_{i,y}$ = Net calorific value of fossil fuel type *i* in year *y* [BTU/Volume] – OFFICIAL INFORMATION FROM CNDC.
- P.N = Identification of power plant/unit for the Operating and Build Margins - OFFICIAL INFORMATION FROM CNDC

B: HB OPERATIONS INFORMATION:
- $EGb_{j,y}$ = Electricity generated by the Proyect in the year *y*, by plant *j.* [MWh] – OFFICIAL INFORMATION FROM HB OPERATIONS
- $EGb_{j,h}$ = Electricity generated by the Proyect in the hour *h*, by plant *j.* [MWh] – OFFICIAL INFORMATION FROM HB OPERATIONS

C: SUPERINTENDENCE OF ELECTRICITY AND CNDC INFORMATION:
- $FC_{i,m/n,y}$ = Amount of fossil type *i* consumed by power plant/unit *m*, *n* in year *y* [Volume] – PDMP

D: IPCC INFORMATION:
- $EF_{CO2,i,y}$ = CO_2 emission factor per unit of energy of the fuel type *i* in year *y* [tCO2 / BTU] - IPCC

F: UNFCC INFORMATION:
- Crediting period, methodology approved, monitoring plan, registration and renewal

DESCRIPTION OF INFORMATION - OUTPUTS

E: INFORMATION TO THE DESIGNED OPERATIONAL ENTITY:

E1: => - $EF_{grid,OM,y}$ = f($EG_{PJ,h}$;$EF_{EL,DD,h}$; $EG_{PJ,y}$) = Operating margin CO_2 emission factor in year *y* [tCO_2/MWh]

E2: => - $EF_{grid,BM,y}$ = f($EG_{m,y}$;$EF_{EL,m,h}$; $EG_{m,y}$) = Build Margin CO_2 emission factor in year *y* [tCO_2/MWh]

E3: => - $EF_{grid,CM,y}$ = f(w_{OM}; $EF_{grid,OM,y}$; w_{OM}; $EF_{grid,BM,y}$; w_{BM}) = Combined margin emission factor [tCO2/MWh]

- w_{OM}, w_{BM}: Weighting of operation and build margin emissions factors respectively (%)

E4: => - CERs = f($EG_{PJ,y}$; $EF_{grid,CM,y}$) = Total emissions reductions of the period [tCO2]

G: INFORMATION TO THE UNFCCC:
- Verification/certification report, application for issuance, order release, CERs registration, accreditation accounts participating in

Annex 5

DOCUMENTATION RELATED TO THE DEMONSTRATION AND ASSESSMENT OF ADDITIONALITY

Attachment A: The Rio Taquesi Hydroelectric Power Project is identified to the US Office for Joint Implementation in a preliminary proposal.

IUEP

International Utility Efficiency Partnerships, Inc.

By Fax 586-3485

June 30, 1997

Secretariat - Proposal Review
United States Initiative on Joint Implementation (USIJI)
1000 Independence Avenue, S.W.
PO-6
Washington, D.C. 20585

Dear USIJI Secretariat:

The International Utility Efficiency Partnerships, Inc. (IUEP) submits with pleasure a portfolio of joint implementation project proposals in conjunction with the June 30 project evaluation schedule. We believe that these proposals represent high quality projects in strategic locations of the world and, if approved by the USIJI Evaluation Panel and corresponding host country governments, will demonstrate the value of the joint implementation option to representatives attending the Third Meeting of the Conference of the Parties (COP-3) to be held in December 1997 in Kyoto, Japan. The Evaluation Panel will notice that certain projects have been more developed to date than others. This is due to the request of the USIJI during my briefing on June 4, 1997 on project development status. I was requested during that meeting to reprioritize IUEP projects under DOE Grant #FG36-96GO10155 to recognize certain geopolitical priorities of the Department of Energy and the USIJI.

However, we have sufficient confidence in both the project sponsors and the project feasibilities to submit these projects today, with the understanding that additional information will be provided to continue proposal evaluation during the technical review process. The projects are listed by country, alphabetically:

- Argentina - *The CAPSA Project* is located in Neuquen, Argentina. It involves conversion of six simple cycle turbines to combined cycle (approximately 300 MW) with a CO_2 offset potential of 17 million metric tons over project life. The IUEP has had preliminary meetings with the appropriate Argentine Ministry on the joint implementation aspects on this project and has identified a course of action for host country acceptance. The in-country project manager will be Bob Perez, Project Director, CAPSA and former IUEP Chairman representing Nations Energy / Tucson Electric.

- Bolivia - *The Taquesi River Hydroelectric Power Project* is located north of La Paz in La Chojlla, Bolivia. This is a planned 77 MW facility, which has the potential to displace 38 MW of thermal capacity on the grid and produce significant CO_2 offsets over project life. The project developer reserves the right to withdraw this project from consideration given commercial negotiations underway today in La Paz. However, the project type, the strategic location of Bolivia within the Southern Cone, and the national and regional reputation of the project sponsor are of such importance to overall joint implementation development that the IUEP has identified this project as a place-holder under this round.

USIJI Secretariat
June 30, 1997
Page 2

- China - *The Yu-Wei-Qing Pipeline Project* will originate in Yuxian in Yu County, Eastern Shanxi Province. The Coal Ministry will arrange to purchase under contract 9.7 million tons of raw coal from local mines for thirty years. The coal will be deep cleaned using proprietary technologies commercialized under the sponsorship of the DOE Clean Coal Technology Program. Additional components include: Weifang power generation from cleaned coal, Qingdoa power generation from cleaned coal, fly ash utilization, and the sale of cleaned coal. Potential CO_2 reductions are significant. Further, this project represents a marked evolution of high level People's Republic of China government support for testing the joint implementation concept during this pilot phase.

- Czech Republic - *The ECK Project.* Brad Johnson is in Prague today meeting with Mr. Bizek of the Czech Environmental Ministry. It is the hope of the IUEP and its member companies that this landmark 300 MW fluidized bed combustion project in Kladno will be accepted within the USIJI process upon receipt of final approval from the Czech Republic. I hope to hear later today from Mr. Johnson on this final element of this project. As you are aware, the ECK project is the first project financing in Eastern Europe ($150 million USD International Finance Corporation lead debt participant), the first example of retail electricity wheeling in Eastern Europe, the first large-scale joint implementation project to be submitted to USIJI, and the first coal project submitted under this program. This program has the highest profile of IPP development in Europe, and consequently the IUEP strongly recommends that this project be accepted by the United States government as qualified for joint implementation recognition under the Framework Convention on Climate Change.

- Guatemala - *The Bio-Gen Guatemala Project* is a 15 MW biomass waste-to-energy plant to be located at a stand-alone site near the population center of Guatemala City. The plant will be owned and operated by Biomasa-Generacion Guatemala for the purposes of generating electrical power for sale to INDE. The primary fuel for the plant will be residual biomass from within the region primarily logging residues and saw mill wastes, both of which are plentiful in the region around the proposed site. This project represents a replication of the IUEP's flagship joint implementation, biomass generation effort - Biomasa-Generacion S. de R.L., Honduras (Phase I, Guaimaca Site and Phase II, Sava Site).

- Kazakhstan - *The Karaganda GRES - 2 Project* entails improvements upon a 608 MW coal-fired power plant located in Topar, Kazakhstan. The plant will be owned and operated by Kazakh Power Partners, of which *e prime* / Public Service of Colorado holds an ownership interest. The plant also produces hot water for district heating systems for the town of Abay and Topar. The project consists of recovery of fly ash for use as a Portland cement additive, reduction of ash in the fuel delivered to the boiler, improvement of boiler feedwater heaters which improves efficiency, introducing U.S. technology to improve overall plant efficiency, and upgrading fly ash removal systems.

- Nicaragua *The Bio-Gen Nicaragua Project* is a 15 MW biomass waste-to-energy plant to be located at a sugar mill in the southwestern portion of the country, where the electricity transmission system is well established. The plant will be owned and operated by Biomasa-Generacion Nicaragua for the purposes of generating electrical power for

USIJI Secretariat
June 30, 1997
Page 3

sale to ENEL. The primary fuel for the plant will be bagasse from an existing sugar mill, with residual biomass from within the region used to supplant the fuel supply. This residual biomass will come from sources that are plentiful throughout the region, particularly logging residues, sawdust, and waste wood. As is the case in Guatemala, this project also represents a replication of the Biomasa-Genercion S. de. R.L., Honduras project.

- Paraguay - ***The Laguna Tigre / Mariscal Estigarribia Project*** consists of two plots of land totaling approximately 70,000 hectares (175,000 acres) in the Gran Chaco. This project will lead to land conservation, wildlife protection, and sustainable forestry activities. It is important to bring Paraguay into the growing number of countries participating in joint implementation activities. The IUEP believes that the national and regional reputation of the project sponsor vis-a-vis overall joint implementation development in the Southern Cone is significant and that this project should qualify as a place-holder under this round. This project will be developed jointly by Carlos Casado S.A., Asuncion and the IUEP, with the assistance of *e prime* / Public Service of Colorado.

- Philippines - ***The Philippines Bioten Biomass Project*** is an electric energy project which utilizes rice hulls as the power plant fuel. The production of electricity from a waste product results in less energy being required from fossil-fueled plants, resulting in less fossil emissions and the conservation of fossil fuels. The project will be located in the city of Pili, Province of Camarines Sur, on the island of Luzon. The IUEP believes that this project is of significant geopolitical importance to the USIJI process, and if successful, has the potential for replication throughout Indonesia.

We are pleased to participate in the President's U.S. Climate Change Initiative. We very much endorse the President's call on June 26, 1997 for flexibility in achieving emissions targets, as well as his challenge to engage the participation of developing countries in mitigating greenhouse gas emissions. We also stand ready to support the President in the Developing Country Climate Change Initiative Program, as well as the OPIC Environmental Initiative and the Climate Change Technology Strategy.

Please call on me at (202) 508-5507 to further discuss these proposals.

Sincerely,

Ronald C. Shiflett, Jr.
Executive Director

Attachment B: Issuance of Ministerial Decree No. 153/99 providing legal certification to the Rio Taquesi Hydroelectric Power Project by the Bolivian Office on Joint Implimentation (PRONIC)

Ministerio de Desarrollo Sostenible y Planificación

153 / 99

RESOLUCION MINISTERIAL N° [illegible]
La Paz, [illegible] de junio [illegible]

CONSIDERANDO:

Que, mediante Decreto Supremo No. 25030 de 27 de abril de 1998, se crea el Programa Nacional de Implementación Conjunta (PRONIC), dependiente del Ministerio de Desarrollo Sostenible y Planificación, [illegible] a éste, la calidad de autoridad nacional competente en materia de Cambios Climáticos, encargado de considerar y presentar los proyectos [illegible] en las actividades implementadas Conjuntamente elevados al PRONIC;

Que, la Empresa Hidroeléctrica Boliviana S.A., ha presentado a esta Cartera de Estado el Resumen Ejecutivo del Proyecto de Aprovechamiento Hidroeléctrico del Río Taquesi y los procedimientos, cálculos y resultados de la emisiones de gases de efecto invernadero evitadas por el mismo;

Que, la precitada Sociedad Anónima, a través de la Compañía International Utility Efficiency Partnership, Inc. (IUEP), realizará la solicitud ante la United States Initiative on Joint Implementation (USIJI), para la certificación de la reducción en las emisiones de gases de efecto invernadero, ante el Gobierno de los Estados Unidos de América; para lo cual requiere de la manifestación expresa de conformidad por parte de nuestro Gobierno en cuanto a la integración del proyecto de Implementación Conjunta, en el Programa de la USIJI;

Que, para la Implementación Conjunta de este Proyecto se hace imprescindible la suscripción de un Convenio entre esta Portafolio de Estado y la Empresa Hidroeléctrica Boliviana S.A., acuerdo que deberá elaborarse conjuntamente para comenzar a desarrollar las actividades objeto del Proyecto;

POR TANTO,

El Ministro de Desarrollo Sostenible y Planificación, en uso de sus atribuciones y funciones conferidas por Ley,

RESUELVE:

PRIMERO.- Manifestar la conformidad a la realización del Proyecto de Aprovechamiento Hidroeléctrico del Río Taquesi en el Marco de Actividades Implementadas Conjuntamente de acuerdo a la convención Marco de las Naciones Unidas sobre cambio Climático.

SEGUNDO.- Instruir al Viceministro de Medio Ambiente, Recursos Naturales y Desarrollo Forestal, en el Marco del PRONIC la elaboración del Convenio para la Implementación Conjunta del Proyecto antes referido, con la perspectiva de incluirlo en el Mecanismo de Desarrollo Limpio del Protocolo de Kioto, una vez que éste esté en vigencia.

Regístrese, comuníquese y archívese.

[illegible]

ES COPIA FIEL DEL ORIGINAL

Av. Arce N° 2147 Casilla N° 12814 Telfs.: [illegible] Fax: [illegible] La Paz - Bolivia

Attachment C: Issuance of the Authorization to Proceed with the construction of the Project to the Engineering Procurement and Construction contractor.

HIDROELECTRICA BOLIVIANA S.A.
22 Fuerza Naval Avenue Calacoto
La Paz, Bolivia

Telephone (591-2) 795662
Fax (591-2) 770933

January 28, 2000

Mr. Bruce Ainsworth
Black & Veatch International Company
8400 Ward Parkway
Kansas City, MO 64114

RE: Authorization to Proceed with Change Order Authority

Dear Mr. Ainsworth:

Hidroelectrica Boliviana, S.A., a Bolivia corporation ("Owner") hereby delivers this Authorization to Proceed to B&V/Colenco and Black & Veatch International Company (together, the "Contractor") under and in accordance with the terms and conditions of: (i) the Engineering and Procurement Services Agreement, dated July 29, 1998, between owner and B&V/Colenco, a Swiss joint venture, as amended by Amendment No. 1 to Engineering Procurement Services Agreement, dated April 30, 1999, Amendment No. 2 to Engineering and Procurement Services Agreement, dated December 30, 1999, and Amendment No. 3 to Engineering and Procurement Services Agreement, dated January 27, 2000 (together, the "Engineering and Procurement Services Agreement"); (ii) the Construction and Procurement Services Agreement, dated July 29, 1998, between Owner and Black & Veatch International Company, a Missouri corporation, as amended by Amendment No. 1 to Construction and Procurement Services Agreement, dated April 30, 1999, Amendment No. 2 to Construction and Procurement Services Agreement, dated December 30, 1999, and Amendment No. 3 to Construction and Procurement Services Agreement, dated January 27, 2000 (together, the "Construction and Procurement Services Agreement"); (iii) the Coordination Contract, dated July 29, 1998, among Owner, B&V/Colenco and Black & Veatch International Company, as amended by Amendment No. 1 to Coordination Contract dated April 30, 1999 and Amendment No. 2 to Coordination Contract, dated December 30, 1999 (the foregoing items (i), (ii) and (iii) referred to herein collectively as the "EPC Agreement"); and (iv) the Limited Notice to Proceed, dated August 14, 1998, delivered by Owner to Black & Veatch International Company. This notice is delivered pursuant to Section 20.2 of the EPC Agreement and is subject to the requirements therein contained.

Pursuant to Section 4.1 of the EPC Agreement, Owner hereby authorizes Contractor to effect change orders to procure (x) two (2) cranes, in accordance with Exhibit J, Paragraph 2(c), of the Engineering and Procurement Services Agreement, (y) the Chojlla

Powerhouse Stand Alone Satellite Communication System, in accordance with Exhibit J, Paragraph 5(a), of the Construction and Procurement Services Agreement and Exhibit J, Paragraph 3(a), of the Engineering and Procurement Services Agreement, and (x) the Separate Revenue Metering for each Plant at Pichu Substation, in accordance with Exhibit J, Paragraph 5(b), of the Construction and Procurement Services Agreement and Exhibit J, Paragraph 3(b), of the Engineering and Procurement Services Agreement.

HIDROELECTRICA BOLIVIANA, S.A.

By: [signature]
Title: President

This Authorization to Proceed is hereby acknowledged and accepted by Contractor as of the date first set forth above and in accordance with the foregoing terms and conditions.

B&V/COLENCO, a joint venture

By: Bruce A. Quinsworth
Title: Project Director

BLACK & VEATCH INTERNATIONAL COMPANY, a coventurer

By: Bruce A. Quinsworth
Title: Vice President

COLENCO POWER ENGINEERING, LTD. a coventurer

By: [signature] [signature]
Title: Exec. Vice President — Vice-president

BLACK & VEATCH INTERNATIONAL COMPANY

By: Bruce A. Quinsworth
Title: Vice President

991208AL.doc

Attachment D: Case 1 (without benefit of CER sales) Proforma

TENASKA INTERNATIONAL LLC
HIDROELECTRICA BOLIVIANA S.A. PROJECT
SCHEDULE OF CASH FLOW
AMOUNTS IN MILLIONS

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
	0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
SOURCES OF CASH																
Operating Revenues	0.0	0.0	13.5	20.0	21.2	21.4	22.2	22.3	22.4	23.1	23.6	24.0	24.3	24.7	25.1	25.4
Total Other Income	0.0	-0.0	0.0	0.2	0.4	0.5	0.3	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3
VAT Collected on Sales	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Disbursements from Debt Service Reserve	0.0	0.0	0.2	0.0	0.0	0.1	0.2	0.1	0.2	0.1	0.2	0.1	0.2	4.1	0.2	0.2
Return of Dividend Reserve	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Return of Working Capital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Return of Special Reserve	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0	0.0
Cash on Hand	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL SOURCES OF CASH	0.0	-0.0	13.7	20.2	21.6	22.0	22.7	22.6	22.8	23.3	24.0	24.2	24.8	39.0	25.5	25.9
USES OF CASH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transmission Expense	0.0	0.0	1.0	1.4	1.2	1.2	1.2	1.2	1.1	1.1	1.2	1.2	1.2	1.2	1.3	1.3
Electricity Superintendency Dues	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3
Plant O & M Expense	0.1	0.1	0.3	0.4	0.5	0.5	0.5	0.9	0.8	0.7	0.7	0.9	0.7	0.8	1.1	0.9
Home-Office O & M Expense	0.0	0.0	0.4	0.6	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.9	0.9	1.0
Value Added Tax Paid	0.0	0.0	0.0	0.0	0.0	1.3	2.9	2.9	2.9	3.0	3.1	3.1	3.2	3.2	3.3	3.3
Transaction Tax	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Interest Expense	0.0	0.0	3.2	6.8	6.8	6.7	6.4	6.0	5.6	5.2	4.7	4.2	3.8	2.8	1.9	1.6
Withholding Tax on Interest Expense	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bank Fees & LC Expenses	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
EPC Contractor Bonus Payments	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Principal Repayment	0.0	0.0	0.0	0.0	0.0	3.5	3.5	3.9	3.9	4.3	4.3	4.6	4.6	13.2	3.2	3.2
Debt Service Reserve Contribution	0.0	0.0	0.0	0.2	0.0	1.8	0.0	0.1	0.0	0.1	0.0	0.0	0.0	2.7	0.0	0.0
Special Reserve Contribution	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	2.0	2.0	2.0	2.0	1.0	0.0	0.0	0.0
Equity Contribution	31.7	0.6	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL USES CASH	31.8	0.7	7.5	9.8	9.4	15.9	15.4	17.0	17.3	17.4	17.0	17.1	15.6	25.1	12.0	11.6
Cash Flow Before Tax	-31.8	-0.7	6.3	10.5	12.2	6.1	7.3	5.5	5.5	5.9	7.0	7.1	9.2	13.9	13.5	14.3
Cumulative Cash Flow Before Tax	-31.8	-32.4	-26.1	-15.7	-3.5	2.6	9.9	15.4	20.9	26.8	33.7	40.9	50.0	63.9	77.4	91.7
Before Tax IRR	0.0%	0.0%	0.0%	-22.2%	-3.5%	2.2%	7.1%	9.8%	11.8%	13.4%	14.8%	15.9%	16.9%	18.1%	18.9%	19.5%
Less: Income Tax Payments	-0.0	-0.0	0.8	1.1	1.5	1.9	2.4	2.8	3.0	3.3	3.5	3.6	3.9	4.2	4.4	4.7
Cash Flow After Tax	-31.7	-0.6	5.4	9.3	10.7	4.2	4.9	2.7	2.5	2.6	3.5	3.5	5.3	9.7	9.1	9.6
After Tax IRR				-25.7%	-7.2%	-2.5%	1.8%	3.6%	5.0%	6.2%	7.6%	8.6%	9.9%	11.5%	12.6%	13.5%

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	20
	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	3
SOURCES OF CASH																
Operating Revenues	25.8	26.2	26.6	27.0	27.5	27.9	28.3	28.8	29.2	29.7	30.1	30.6	31.1	31.6	32.1	32.
Total Other Income	0.3	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.7	0.7	0.8	0.8	0.8	0.9	0.9	0.
VAT Collected on Sales	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
Disbursements from Debt Service Reserve	0.2	0.2	0.2	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
Return of Dividend Reserve	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
Return of Working Capital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
Return of Special Reserve	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
Cash on Hand	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
TOTAL SOURCES OF CASH	26.3	26.8	27.2	29.3	27.9	28.4	28.9	29.4	29.9	30.4	30.9	31.4	31.9	32.4	32.9	33.
USES OF CASH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
Transmission Expense	1.3	1.3	1.4	1.4	1.4	1.4	1.5	1.5	1.5	1.6	1.6	1.6	1.7	1.7	1.7	1.
Electricity Superintendency Dues	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.
Plant O & M Expense	0.8	0.9	0.9	0.9	0.9	1.2	1.5	1.0	1.0	1.1	1.1	1.1	1.2	1.4	1.7	1.
Home-Office O & M Expense	1.0	1.1	1.1	1.2	1.2	1.3	1.3	1.4	1.5	1.5	1.6	1.7	1.7	1.8	1.9	2.
Value Added Tax Paid	3.4	3.4	3.5	3.5	3.6	3.6	3.7	3.7	3.8	3.9	3.9	4.0	4.0	4.1	4.2	4.
Transaction Tax	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
Interest Expense	1.3	0.9	0.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
Withholding Tax on Interest Expense	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
Bank Fees & LC Expenses	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
EPC Contractor Bonus Payments	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
Principal Repayment	3.2	3.2	3.2	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
Debt Service Reserve Contribution	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
Special Reserve Contribution	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
Equity Contribution	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
TOTAL USES CASH	11.3	11.1	10.9	10.7	7.4	7.8	8.3	7.9	8.1	8.3	8.5	8.7	8.9	9.3	9.8	9.
Cash Flow Before Tax	15.0	15.7	16.3	18.6	20.5	20.6	20.6	21.4	21.8	22.1	22.4	22.7	23.0	23.1	23.1	23.
Cumulative Cash Flow Before Tax	106.8	122.4	138.7	157.3	177.9	198.5	219.1	240.5	262.3	284.3	306.7	329.4	352.4	375.5	398.6	422.
Before Tax IRR	20.0%	20.4%	20.8%	21.0%	21.3%	21.5%	21.6%	21.8%	21.9%	21.9%	22.0%	22.1%	22.1%	22.1%	22.2%	22.
Less: Income Tax Payments	4.9	5.0	5.2	5.4	5.5	5.6	5.6	5.8	5.9	6.0	6.1	6.2	6.3	6.3	6.3	6.
Cash Flow After Tax	10.2	10.6	11.1	13.2	15.0	15.0	15.0	15.6	15.8	16.1	16.3	16.5	16.7	16.8	16.8	17.
After Tax IRR	14.2%	14.8%	15.2%	15.7%	16.1%	16.4%	16.6%	16.8%	17.0%	17.1%	17.3%	17.4%	17.4%	17.5%	17.6%	17.

Attachment E: Case 2 (with benefit of CER sales) Proforma

TENASKA INTERNATIONAL LLC
HIDROELECTRICA BOLIVIANA S.A. PROJECT
SCHEDULE OF CASH FLOW
AMOUNTS IN MILLIONS

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
	0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
SOURCES OF CASH																
Operating Revenues	0.0	0.0	13.5	20.0	21.2	21.4	22.2	22.3	22.4	23.1	23.6	24.0	24.3	24.7	25.1	25.4
Total Other Income	0.0	-0.0	0.0	0.2	0.4	0.5	0.3	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3
VAT Collected on Sales	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Disbursements from Debt Service Reserve	0.0	0.0	0.2	0.0	0.0	0.1	0.2	0.1	0.2	0.1	0.2	0.1	0.2	4.1	0.2	0.2
Return of Dividend Reserve	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Return of Working Capital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Return of Special Reserve	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0	0.0
Cash on Hand	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL SOURCES OF CASH	0.0	-0.0	13.7	20.2	21.6	22.0	22.7	22.6	22.8	23.3	24.0	24.2	24.8	39.0	25.5	25.9
USES OF CASH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transmission Expense	0.0	0.0	1.0	1.4	1.2	1.2	1.2	1.2	1.1	1.1	1.2	1.2	1.2	1.2	1.3	1.3
Electricity Superintendency Dues	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3
Plant O & M Expense	0.1	0.1	0.3	0.4	0.5	0.5	0.5	0.9	0.8	0.7	0.7	0.9	0.7	0.8	1.1	0.9
Home-Office O & M Expense	0.0	0.0	0.4	0.6	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.9	0.9	1.0
Value Added Tax Paid	0.0	0.0	0.0	0.0	0.0	1.3	2.9	2.9	2.9	3.0	3.1	3.1	3.2	3.2	3.3	3.3
Transaction Tax	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Interest Expense	0.0	0.0	3.2	6.8	6.8	6.7	6.4	6.0	5.6	5.2	4.7	4.2	3.8	2.8	1.9	1.6
Withholding Tax on Interest Expense	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bank Fees & LC Expenses	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
EPC Contractor Bonus Payments	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Principal Repayment	0.0	0.0	0.0	0.0	0.0	3.5	3.5	3.9	3.9	4.3	4.3	4.6	4.6	13.2	3.2	3.2
Debt Service Reserve Contribution	0.0	0.0	0.0	0.2	0.0	1.8	0.0	0.1	0.0	0.1	0.0	0.0	0.0	2.7	0.0	0.0
Special Reserve Contribution	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	2.0	2.0	2.0	2.0	1.0	0.0	0.0	0.0
Equity Contribution	31.7	0.6	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL USES CASH	31.8	0.7	7.5	9.8	9.4	15.9	15.4	17.0	17.3	17.4	17.0	17.1	15.6	25.1	12.0	11.6
Cash Flow Before Tax	-31.8	-0.7	6.3	10.5	12.2	6.1	7.3	5.5	5.5	5.9	7.0	7.1	9.2	13.9	13.5	14.3
Cumulative Cash Flow Before Tax	-31.8	-32.4	-26.1	-15.7	-3.5	2.6	9.9	15.4	20.9	26.8	33.7	40.9	50.0	63.9	77.4	91.7
Before Tax IRR	0.0%	0.0%	0.0%	-22.2%	-3.5%	2.2%	7.1%	9.8%	11.8%	13.4%	14.8%	15.9%	16.9%	18.1%	18.9%	19.5%
Less: Income Tax Payments	-0.0	-0.0	0.8	1.1	1.5	1.9	2.4	2.8	3.0	3.3	3.5	3.6	3.9	4.2	4.4	4.7
Cash Flow After Tax	-31.7	-0.6	5.4	9.3	10.7	4.2	4.9	2.7	2.5	2.6	3.5	3.5	5.3	9.7	9.1	9.6
After Tax IRR				-26.0%	-7.5%	-2.8%	1.5%	3.3%	4.7%	5.9%	7.3%	8.3%	9.6%	11.2%	12.3%	13.2%

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
SOURCES OF CASH															
Operating Revenues	25.8	26.2	26.6	27.0	27.5	27.9	28.3	28.8	29.2	29.7	30.1	30.6	31.1	31.6	32.1
Total Other Income	0.3	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.7	0.7	0.8	0.8	0.8	0.9	0.9
VAT Collected on Sales	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Disbursements from Debt Service Reserve	0.2	0.2	0.2	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Return of Dividend Reserve	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Return of Working Capital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Return of Special Reserve	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cash on Hand	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL SOURCES OF CASH	26.3	26.8	27.2	29.3	27.9	28.4	28.9	29.4	29.9	30.4	30.9	31.4	31.9	32.4	32.9
USES OF CASH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transmission Expense	1.3	1.3	1.4	1.4	1.4	1.4	1.5	1.5	1.5	1.6	1.6	1.6	1.7	1.7	1.7
Electricity Superintendency Dues	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Plant O & M Expense	0.8	0.9	0.9	0.9	0.9	1.2	1.5	1.0	1.0	1.1	1.1	1.1	1.2	1.4	1.7
Home-Office O & M Expense	1.0	1.1	1.1	1.2	1.2	1.3	1.3	1.4	1.5	1.5	1.6	1.7	1.7	1.8	1.9
Value Added Tax Paid	3.4	3.4	3.5	3.5	3.6	3.6	3.7	3.7	3.8	3.9	3.9	4.0	4.0	4.1	4.2
Transaction Tax	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Interest Expense	1.3	0.9	0.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Withholding Tax on Interest Expense	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bank Fees & LC Expenses	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EPC Contractor Bonus Payments	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Principal Repayment	3.2	3.2	3.2	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Debt Service Reserve Contribution	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Special Reserve Contribution	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Equity Contribution	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL USES CASH	11.3	11.1	10.9	10.7	7.4	7.8	8.3	7.9	8.1	8.3	8.5	8.7	8.9	9.3	9.8
Cash Flow Before Tax	15.0	15.7	16.3	18.6	20.5	20.6	20.6	21.4	21.8	22.1	22.4	22.7	23.0	23.1	23.1
Cumulative Cash Flow Before Tax	106.8	122.4	138.7	157.3	177.9	198.5	219.1	240.5	262.3	284.3	306.7	329.4	352.4	375.5	398.6
Before Tax IRR	20.0%	20.4%	20.8%	21.0%	21.3%	21.5%	21.6%	21.8%	21.9%	21.9%	22.0%	22.1%	22.1%	22.1%	22.2%
Less: Income Tax Payments	4.9	5.0	5.2	5.4	5.5	5.6	5.6	5.8	5.9	6.0	6.1	6.2	6.3	6.3	6.3
Cash Flow After Tax	10.2	10.6	11.1	13.2	15.0	15.0	15.0	15.6	15.8	16.1	16.3	16.5	16.7	16.8	16.8
After Tax IRR	13.9%	14.5%	14.9%	15.4%	15.8%	16.1%	16.3%	16.5%	16.7%	16.8%	17.0%	17.1%	17.1%	17.2%	17.3%

Annex 6

Environmental Impact Assessment
EXECUTIVE SUMMARY

Name of the Project: **Rio Taquesi Hydroelectric Power Project**
HIDROELECTRICA BOLIVIANA S.A.

Antecedents:
The Environmental Impact Statement (EIS) was prepared in accordance with the requirements specified by Bolivian Environmental Law No. 1333 and the Electricity Law No. 1604.

Natural Environment
The Project is located in the ecological formation known as the Yungas Cloud Forest, found in the eastern mountain range (Cordillera Oriental) between 1,000 and 3,600 m and occurs like a belt around the Cordillera. The formation is characterized by ridges, abrupt slopes, and deep valleys.

The annual rainfall is between 1,300 and 2,000 mm, with 4 humid months, from November to march. the weather can be considered as oligothermic (little change in temperature) with an average annual temperature of 14 ºC. Orographic rain and drizzle are frequent, induced by rapid cooling of air masses colliding as they rise to higher elevations.

Environmental Impacts

Most of the significant impacts of the Project are of low magnitude, reversible, recoverable and temporary. During construction, main impacts came from the removal of vegetation cover when constructing or improving the access roads and other infrastructure. Also, road cut and fill areas associated with the Kacapi access road is visible from nearby tourist areas. Other impacts that were dealt with have to do with the archaeological spots along the Project site, which motivated design changes and other measures. Among its long term impacts, the Project bettered economic conditions due to an increase in the demand for workers, supplies, and services. All the negative impacts were mitigated and environmental control is exercised by the Environmental Authority by means of a monitoring program. There was no relocation of landowners due to the project.

Environmental Management Plan

HB designed and implemented specific measures to prevent negative impacts and to minimize the effect of unavoidable impacts through adequate environmental management techniques. Within the environmental management plan, HB has designed a waste control plan that proposes the minimization, classification, reuse and proper disposal of waste generated by the Project. Project activities, including construction and operation works, are subject to supervision and monitoring from the environmental Authority.

Community Development Support

The Project developer established a Community Development Support policy with three main objectives: to support the conservation of the natural environment; to contribute to the conservation of historical resources (such as archaeological remains) and to assist in the enhancement of life quality in the area of influence of the Project. HB firstly worked together with the only one active non-governmental organization, Fundacion Pueblo, headquartered in Yanacachi by the time the Project started construction (although several other NGOs and governmental development agencies worked in the area, Fundacion Pueblo is the first with offices there). HB worked with Fundacion Pueblo in the framework of an agreement whereby Fundacion Pueblo was funded by HB to support community activities. The said agreement is not longer effective (as of 2005) and HB is fully using its own social development arm, the Fundacion Taquesi, to achieve broader goals on community development.

Annex 7

Annex 7.1 Original Environmental License

Prefectura del Departamento

La Paz - Bolivia

La Paz, 19 de febrero de 1999
PREF-DORNMA-UMA-SGA-C-044/99

Señor
Ing. Angel Zannier Claros
GERENTE GENERAL
COMPAÑÍA HIDROELECTRICA BOLIVIANA S.A.
Presente.-

REF : LICENCIA AMBIENTAL "PROYECTO HIDROELECTRICO TAQUESI" DE HIDROELECTRICA BOLIVIANA S.A.

Ingeniero Zannier:

Mediante la presente remitó a Ud. la Declaratoria de Impacto Ambiental (DIA) del Proyecto Hidroeléctrico Taquesi en conformidad a lo dispuesto en el Reglamento de Control y Prevención Ambiental de la Ley 1333 del Medio Ambiente.

Sin otro particular, reciba un cordial saludo

Atentamente,

Lic. O. [illegible]
[illegible]
Prefectura del Dpto. de La Paz

Pvimm
Adj. :Declaratoria de Impacto Ambiental
c Arch

Calle Comercio Nº 1200 Esq. Ayacucho – Casilla Nº 8010 – ☎ 374580 - 374589 – Fax 375279

Annex 7.2 Updated Environmental License

La Paz
PREFECTURA DEL DEPARTAMENTO

LICENCIA AMBIENTAL
DECLARATORIA DE IMPACTO AMBIENTAL
021103-05-DIA-001-08

El suscrito Secretario Departamental de Desarrollo Productivo de la Prefectura del Departamento de La Paz

CERTIFICA:

Que, dando cumplimiento al Art. 28° de la Ley N° 1333 del Medio Ambiente, se otorga la presente DECLARATORIA DE IMPACTO AMBIENTAL (DIA) a favor de la empresa HIDROELECTRICA BOLIVIANA S.A. Representante Legal del Proyecto: *"Aprovechamiento Hidroeléctrico del Río Tagquesi"*, que está implementado en la Localidad de la Chojlla, Municipio de Yanacachi, Provincia Suel Yungas, del Departamento de La Paz.

Constituyen partes integrantes de la presente DIA: Programa de Prevención y Mitigación Mitigación – Plan de Aplicación y Seguimiento Ambiental actualizado, Reportes presentados a la Autoridad Ambiental Competente (AAC) de acuerdo a lo previsto por los instrumentos de regulación de alcance particular y todas las notas de comunicación oficial emitidas por la AAC. Sin embargo, deberá sujetarse a las disposiciones vigentes en el país por lo que el **REPRESENTANTE LEGAL**, deberá llevar a la práctica las Medidas de Mitigación, las cuales serán verificadas por la Autoridad Ambiental Competente de acuerdo con el PASA aprobado; documentos en los que se determinan las condiciones que deben implementarse en el proyecto debiendo ser estrictamente cumplidas.

Es cuanto se certifica, para fines consiguientes.

La Paz, 29 de Agosto de 2008

La Paz PROGRESA

Annex 8

SUSTAINABLE DEVELOPMENT VARIABLES TO FOLLOW UP

The following indicators will be checked **not** as part of the Monitoring Plan as stated in the baseline methodology, but for measuring Project's ability to contribute to sustainable development. Reports will be due only to the DNA and are not required for Verification / Certification purposes. "BASELINE" in the following tables means the values corresponding to the area/system (as applicable) prior to the implementation of the Project.

Indicators of Hydric Resources

Topic	Statistic / Indicator	Frequency	Geographical Coverage	Baseline Values
Hydraulic Balance	Rainfall	Bi-monthly	Taquesi River Basin	1800 - 2000mm/year
	Storage Capacity	Bi-monthly	Taquesi River Basin	0
Use of water resources	Available Volume	Bi-monthly	Taquesi River Basin	Kacapi: 104 [Hm]3/year
	Used Volume	Bi-monthly	Taquesi River Basin	0
	Spilled Volume	Bi-monthly	Taquesi River Basin	0
Water quality	pH	Bi-semestrial	Upstream and downstream from each plant	6.5 -7.5
	Total Nitrogen	Bi-semestrial	Upstream and downstream from each plant	12 mg/l
	Total Phosphorus	Bi-semestrial	Upstream and downstream from each plant	0,4 mg/l
	Biochemical Oxygen Demand	Bi-semestrial	Upstream and downstream from each plant	<5 mgO2/l
	Biological Oxygen Demand	Bi-semestrial	Upstream and downstream from each plant	<2 mgO2/l
	Dissolved Oxigen	Bi-semestrial	Upstream and downstream from each plant	>80% sat.
	Total Suspended Solids	Bi-semestrial	Upstream and downstream from each plant	15 mg/l
	Total Coliforms	Bi-semestrial	Upstream and downstream from each plant	20 UFC

Solid Waste Indicators

Topic	Statistic /Indicator	Frequency	Geographical Coverage	Baseline Values
Solid Waste Management	Domestic Solid Waste Production (Ton/Year)	Annual	Project facilities	0
	Disposal of domestic solid waste to the La Paz landfill (Ton/year)	Annual	Project facilities	0

Technology Transfer Indicators

Topic	Statistic /Indicator	Frequency	Geographical Coverage	Baseline Values
Technology Transfer Activities	Number of studenship participants	Annual	Project Facilities	0
	Number of employees trained	Annual	Project Facilities	0
	Hours of employee training	Annual	Project Facilities	0

Antropic Activities Indicators

Topic	Sub-topic	Statistic /Indicator		Frequency	Geographical Coverage	Baseline Values
Antropic Activities	Forest Activities	Affected Surface	Affected Surface/Total surface	Bi-annual	Surrounding areas of the Project	0
		Number of species introduced	Introduced (not indigenous) species	Annual	Surrounding areas of the Project	0
		Re-forested Surface	Re-forested Surface/Total surface	Bi-annual	Surrounding areas of the Project	0
		Species used	Proportion of local species/total species used	Bi-annual	Surrounding areas of the Project	0

Biodiversity Indicators

Topic	Statistic /Indicator	Frequency	Geographical Coverage	Baseline Values
Biodiversity	Quantity of registered and/or classified species (flora) / total referential Nº of species (flora)	Annual	Surrounding areas of the Project	Depends on the source
	Portion of native species / Total species used in revegetation	Annual	Surrounding areas of the Project	0

CO2-related indicators

Topic	Statistic /Indicator	Frequency	Geographical Coverage	Baseline Values
Reduction of CO2	Emission Reduction Rate (tCO2/MWh)	Annual	Project Plants	0
	Annual Generation of the Project (MWh/año)	Annual	Project Plants	0
	Reduced Emissions/year (tCO2/year)	Annual	Project Plants	0
	Required Investment for tCO2 reduced/year (US$/tCO2/year)	Annual	Project Plants	0
	Taxes for tCO2reduced/year (US$/tCO2/year)	Annual	Project Plants	0

Millenium and Other Sustainable Development Indicators

Topic	Statistic /Indicator	Frequency	Geographical Coverage	Baseline Values
Millenium Indicators	GDP/MWh x Production of HB	Annual	National Interconnected System	0
Sustainable Development Indicators	Number of projects and programs that contribute to the creation of jobs	Annual	Surrounding areas of the Project	0
	Total employees of the Project (people)	Annual	Surrounding areas of the Project	0
	Employees per tCO2 reduced/year (people/tCO2/year)	Annual	Surrounding areas of the Project	0
	Number of projects and programs that motivate the development of micro-industries.	Annual	Surrounding areas of the Project	0
	Number of projects and programs in health	Annual	Surrounding areas of the Project	0
	Number of projects and programs in education	Annual	Surrounding areas of the Project	0
	Activities guided to the development of women, youth, indigenous people, African-American-descending Communities, migrants, handicappeds or other groups of the region	Annual	Surrounding areas of the Project	0