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:

Sichuan Tiejue 25MW Hydro Power Project

The version 3.0

PDD was completed on 30/03/2009.

A.2. Description of the project activity:

The Sichuan Tiejue 25MW Hydro Power Project (hereafter referred as the "proposed project") is a high head, new-build hydropower project. The proposed project is developed and owned by Mabian Gaozhuoying River Valley Development Co., Ltd. The proposed project involves the construction and operation of a diversion hydro power station (with a run-of-river reservoir) which is located on the lower reach of Minjiang River, the first-grade breach[1] of Mabian River, which is the Gaozhuoying River water system in Tiejue County, Mabian Yi-nationality Autonomous County, Leshan City, Sichuan Province of China.

The proposed project is a run-of-river scheme. The project activity involves construction of header water retaining structure, sluice and sediment flush structure, water draw and influx structure, diversion tunnel, pressure fore bay, pressure piping and power plant, where the water from the project will be led from dam to the lower reaches of a river through tailrace canal. With a maximum height of the dam to be 139.2 m and the project site to be far from residential area, only one inhabitant need to be resettled due to the project activities.

The total installed capacity of the proposed project is 25MW (2*12.5MW), the area of the reservoir measured in the surface of the water (after the implementation of the project activity, when the reservoir is full) is 16,665m^2, thus the power density of the project is 1,500W/m^2. On the average, the project activity is expected to operate 4,990hours per year and the net grid-connected electricity generation is 103,830MWh.The electricity will be supplied to the 110kV Mabian transformer substation, then to the Leshan City Grid, then to Sichuan Provincial Grid, and finally to the China Centre (Regional) Power Grid (hereafter referred as CCPG).

Electricity generated by the proposed project will displace part of the electricity generated by China Centre Power Grid which is dominated by fossil fuel-fired power plants, and thus achieve greenhouse gas (GHG) emission reductions. The estimated annual CO_2 emission reductions are 98,877 tCO_2e.

As a renewable energy (hydro power) project, the proposed project will contribute to the local sustainable development through following aspects:

- To displace part of the electricity from coal-fired power plants, and thus will avoid environmental pollution caused by coal burning.
- To make good use of the local water resource to solve the difficulties of lack of power and unstable voltages, improve the life quality of local people and reduce poverty.
- To promote the change of local energy structure of bavin, coal and coal-fired power.

[1] Note: In a water system, the river directly flow into sea or interior lake is called 'Main Steam'; the river flow into Main Steam is called the "The First-Grade Breach', and the river flow into First-Grade Breach is called "the Second-Grade Breach", and so on.

- To create new job opportunities for the local people: 1800 temporary job opportunities will be available during the construction period and 44 permanent jobs during the operation time.

A.3. Project participants:

Table A.1: Project participants

Name of Party involved ((host) indicates a host Party)	*Private and/or public entity(ies) project participants (as applicable)*	*Kindly indicate if the Part involved wishes to be considered as project participant (Yes/No)*
P.R. China(host)	*Mabian Gaozhuoying River Valley Development Co., Ltd.*	*No*
Netherlands	*China Carbon N.V.*	*No*

The detailed information of participants is included in Annex 1.

A.4. Technical description of the project activity:

A.4.1. Location of the project activity:

A.4.1.1. Host Party(ies):

P.R. China

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

Sichuan Province

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

Tiejue County, Mabian Yi-nationality Autonomous County, Leshan City

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

The proposed project is located in the Tiejue County, 48km away from the centre of the Mabian Yi nationality Autonomous County. The dam is located below the river section of Gaozhuoying upstream gold and silver river converge jaws, the power plant factory site is located in the converge jaws between Gaozhuoying river with right shore branch stove brook (to call camel ditch). The exact geographic location of the dam is the latitude of 28°57′47″N and the longitude of 103°53′30″E. The power plant is sited on the lower reach of Minjiang River, the first-grade breach of Mabian River, Gaozhuoying River system. The exact geographic location of the power plant is the latitude of 28°58′15″N and the longitude of 103°53′05″E.

Figure 1 shows the location of the proposed project.

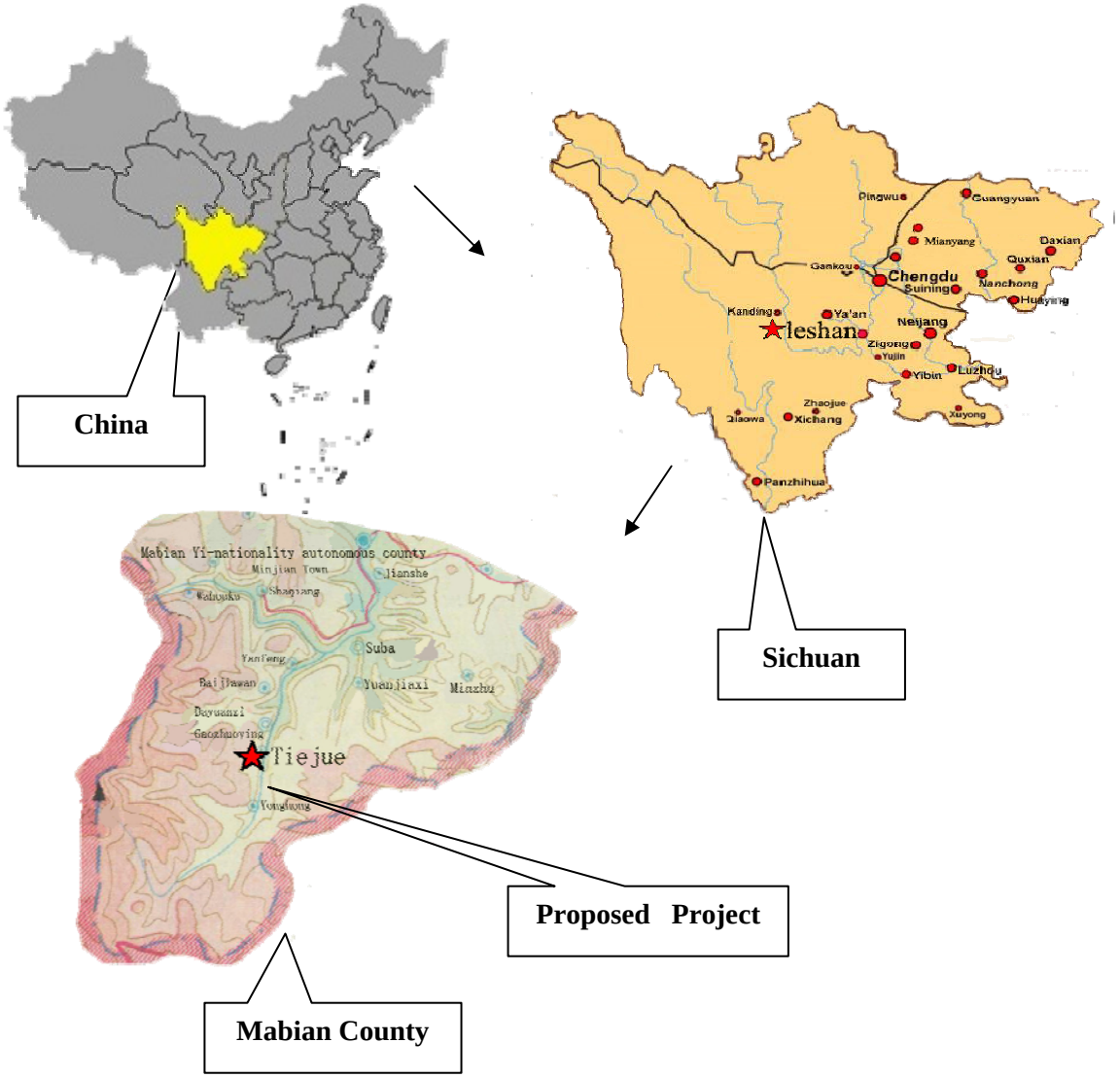

Figure A.1. Geographical Location of the Proposed Project

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

Category 1, energy industries (renewable sources)

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

The common established hydropower generation technology is used by the proposed project for electricity generation and transmission. The proposed project is a run–of–river hydro power project, with an installed capacity of 25MW (2*12.5MW) and a designed operation life of 30 years. The project consists of three main parts: the intake system (run-of-river reservoir), the tunneling system and the power plant. The intake system constitutes of one sluicing gate and three flood gates, and the max height of the dam is 8m. The tunneling system consists of a penstock, pressure adjustment pool and high pressure pipelines.

Through the tunnel, a water head of 139.2m is formed to take advantage of the natural height drop. The hydraulic pressure increased through the high pressure pipeline, and then the water flows into the power plant and drives the generators to generate electricity.

Then the electricity will be connected to a 110 kV high voltage switchyard and 35kV transmission lines from the power plant to the Mabian 110kv transformer station via one 110kV outlet line, then to the Leshan City Grid, then to Sichuan Provincial Grid, and finally to the CCPG.

The main technology parameters are as follows:

Talbe A.2：Main technology parameters

Item	Unit	Value
Installed capacity	MW	25
Annual utilization hours	Hour	4,990
Average annual power generation	MWh/y	124,800
Net grid-connected electricity generation	MWh/y	103,830

The average annual power generation 124,800MWh/y and net grid-connected annual electricity generation 103,830MWh/y of this project activity is as per the following calculation process from the Expand Capacity Report developer, the Leshan City water conservancy and Power Architecture and Reconnaissance Design Institute.

This calculation process also can be originated from the “Economic Evaluation Code for Small Hydropower Projects” issued by the Ministry of Water Resources in 1995 (SL16-95)”. In section 3 of this Code, the revenue calculation is stipulated as per the following formula:

Revenue from power sale = valid electricity amount*(1-consumed electricity of plant)*(1-line loss)*power tariff = the net electricity delivered to the grid*power tariff

Therefore, the net electricity delivered to the grid is calculated as follows,

Net electricity delivered to the grid= Valid electricity amount*(1-Consumed electricity of plant)*(1-Line loss)

As per the SL16-95, the definition of valid electricity amount is calculated by Average annual power generation multiply Coefficient of the valid electricity. Some factors such as prediction of the system load, power balance of the system, repair of the equipment and equipment failure rate cause the coefficient. It means that because of these factors, the Valid electricity amount can not be achieved to the design value of Average annual power generation.

The simple calculation method which can be used at the stage of program and feasibility study of the valid electricity amount is as follow,

Valid electricity amount= Average annual power generation*Coefficient of the valid electricity

This project is a grid-connected run-of-river hydro power project with daily regulating, so the coefficient of the valid electricity can be defined vary from 0.7-0.9 according to the SL16-95, the Expand Capacity Report developer choose 0.871 for the this project, compared to the range of 0.7-0.9, this value is relatively conservative.

So the Valid electricity amount=124,800*0.871≈108,700MWh/y.

The ratio of consumed electricity of plant is 0.5%, and the ratio of line loss is 4% caused of the length of the line is 12km.

So Net electricity delivered to the grid= valid electricity amount * (1-consumed electricity of plant) * (1-line loss) =108,700MWh/y*(1-0.5%)*(1-4%)=103,830MWh/y

The main technical parameters of the equipments used in the proposed project can be got from Table A.3.

Table A.3：Main technical parameters of the equipments

Hydro turbine		***Generator***	
Type	*$HLJF_{2053}$—LJ—125*	*Type*	*$SF_{1.25}$—10/3000*
Quantity	*2*	*Quantity*	*2*
Rated head	*127.8m*	*Rated power*	*12,500kW*
Rated speed	*600r/min*	*Power factor*	*cosφ=0.8*
Designed flow	*12.1m^3/s*	*Rated Voltage*	*10.5kV*
Designed life	*30years*	*Designed life*	*30years*

The technology, which has used worldwide, used is safe on environment. Characteristics of the projects and its construction methodology will not permit a negative damage to the ecosystem. Moreover, it will allow the project to conserve the biodiversity of the Gaozhuoyinghe River drainage area. The main equipments, such as the turbines and electricity generators, are made in the host country. No technology transferred from other countries is involved in this project activity.

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

It is expected that the proposed project activity will generate annual emission reductions of 98,877 tCO_2e. The renewable crediting period (3*7 years) is chosen. In the first seven-year crediting period (from 01/08/2009 to 31/07/2016), the total emission reductions generated by the proposed project is692,139tCO_2e.

Table A.4: The estimation of the emission reductions in first crediting period

Years	***Annul Estimation of emission reductions(tCO_2e)***
01/08/2009-31/12/2010	*41,199*
2010	*98,877*
2011	*98,877*
2012	*98,877*
2013	*98,877*
2014	*98,877*
2015	*98,877*
01/01/2016-31/07/2016	*57,678*

Total estimated reductions(tCO_2e)	*692,139*
Total number of crediting years	*7*
Annual average over the crediting period of estimated reductions(tCO_2e)	*98,877*

A.4.5. Public funding of the project activity:

There is no public funding involved in this proposed 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 methodology used for the proposed project is the approved consolidated baseline and monitoring methodology ACM0002 "Consolidated baseline and monitoring methodology for grid-connected electricity generation from renewable sources." (version 07).

This methodology is available on the following website:

http://cdm.unfccc.int/UserManagement/FileStorage/CDMWF_AM_BW759ID58ST5YEEV6WUCN5744MN763

This methodology uses the "Tool to calculate the emission factor for an electricity system" (version 01.1).

This tool is available on the following website:

http://cdm.unfccc.int/methodologies/Tools/EB35_repan12_Tool_grid_emission.pdf

This methodology adopts the "Tool for the demonstration and assessment of additionality" (version 05.2).

This tool is available on the following website:

http://cdm.unfccc.int/methodologies/PAmethodologies/AdditionalityTools/Additionality_tool.pdf

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

The methodology ACM0002 (version 07) is applicable for the proposed project, and the proposed project meets all applicability conditions of the methodology ACM0002 as follows:

- The proposed project is a grid-connected renewable power generation project activity that involves electricity capacity additions from a new hydropower type station and the electricity generated by the proposed project will be supplied to CCPG,
- The proposed project involves the electricity capacity additions from new run-of-river hydro power type station, the project will built a new reservoir with the power density is 1,500W/m^2, greater than 4W/m^2;
- The proposed project does not involve switching from fossil fuels to renewable energy at the site of the project activity,
- The geographic and system boundaries for the CCPG can be clearly identified and information and data on the characteristics of the grid is available.

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

The power generated by the proposed project will be transferred to the CCPG via the Sichuan Provincial Grid. The project boundary covers the power station such as water-retaining structure, power plant, and auxiliary facilities. The space boundary of this project consists of the physical and geological boundary of this specific project, and all the other power plants connect to the CCPG.

For the purpose of determining the OM and BM emission factors, a project electricity system is defined by the spatial extent of the power plants that can be dispatched without significant transmission constraints. The electricity generated by the proposed project will be connected to CCPG. According to the ''*2007China Regional Power Grid Baseline Emission Factor*' published on 9th, August, 2007 by Chinese DNA[2],CCPG includes Henan Provincial Power Grid, Hubei Provincial Power Grid, Hunan

[2] http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File1364.pdf

Provincial Power Grid, Jiangxi Provincial Power Gird, Sichuan Provincial Power Grid and Chongqing City Power Grid.

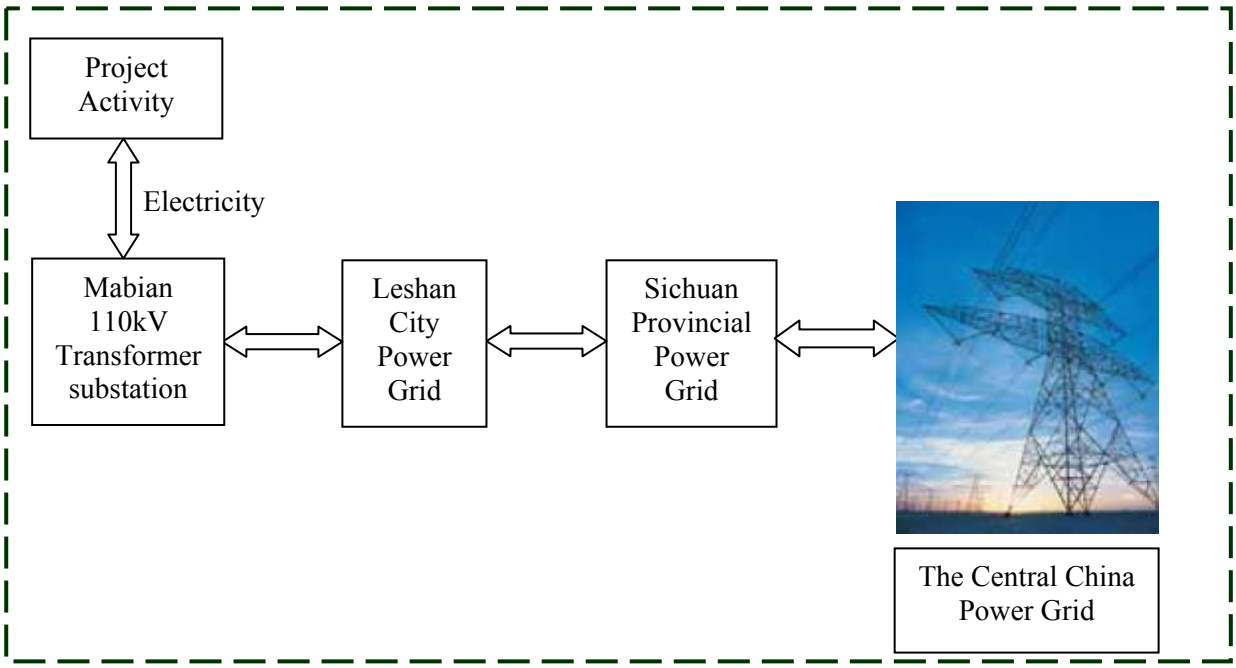

Figure B.1. Proposed project boundary

The GHG emission sources included in or excluded from the project boundary are as follows:

Table B.1 Inclusion of gases and sources in the calculation of the emission reductions

	Source	*Gas*	*Included ?*	*Justification / Explanation*
Baseline	*CO_2 emissions from electricity generation in fossil fuel fired power plants of CCPG*	*CO_2*	*Yes*	*Main emission sources*
		CH_4	*No*	*Minor emission source.*
		N_2O	*No*	*Minor emission source.*
Project Activity	*Project Emission of Tiejue 25MW hydropower project*	*CO_2*	*No*	*Minor emission source*
		CH_4	*No*	*The project is grid-connected electricity generation from renewable sources, and the power density of the project is 1,500W/m^2, greater than 10W/m^2,, project emission is considered as zero according to ACM0002. This is for simplification.*
		N_2O	*No*	*Minor emission source*

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

In the absence of the proposed project, the possible alternatives to the proposed project would be as the following:

1) The proposed project activity, but not undertaken as CDM project activity;
2) Construction of a fossil fuel-fired power plant with equivalent amount of annual power output;
3) Construction of a power plant using other sources of renewable energy with equivalent amount of annual power output; and
4) Provision of equivalent amount of annual power output by the grid (CCPG) where the proposed project is connected into.

The scenario most likely to occur among the four alternative scenarios is analyzed as follows:
As for alternative 1), based on financial analysis illustrated in the following section B.5, the project IRR of total investment is 8.36%, less than the benchmark IRR 10%. It is not financial feasible and is therefore not the baseline scenario.
As for alternative 2), the installed capacity of the proposed project is 25MW, considering the same annual electricity output; the alternative for the proposed project should be a fuel-fired power plant with installed capacity lower than 25MW. Further, as the proposed project is a grid-connected hydropower generation project, the alternative must be a grid-connected fuel-fired power generation project. However, according to China's regulations, construction of fuel-fired power plants with the installed capacity lower than 135MW is prohibited in the areas which can be covered by large grids such as provincial grids[3], and the coal-fired power units with capacity of less than 100 MW is strictly limited for installation[4]. For these reasons, the possible alternative of building a fuel-fired power plant with an installed capacity lower than 25MW conflicts with China's current regulations. Therefore, alternative 2) is not feasible as a realistic and credible alternative scenario.

As for alternative 3), due to the constraints of geographical conditions and other objective conditions, renewable energy resources such as wind power and solar power are spare in the area where the project located in. The average annual wind power density of the project location[5] is almost below 50W/m^2, which is the low degree in China. The solar power of the project location[6] is almost below 5,000MJ/m^2y, which is the low degree in China too. At the same time, solar PV, which is considered to be too cost intensive[7] for generating the equivalent annual output. Biomass power plants face some barriers, such as high investment[8], lacking of operating experience and low benefit[9], are necessary to apply for CDM for retaining normal operation. There is neither potential for wave or tidal energy nor for geothermal energy in the project's area. Therefore, alternative 3) is not feasible as a realistic and credible alternative scenario.

As for alternative 4), under the current relevant laws and regulations in China's power market, the existing capacity and newly added capacity building of CCPG meet the requirements of the national laws and regulations, and economically viable. So Provision of equivalent amount of annual power output by the CCPG where the proposed project is connected into is an economically viable alternative.

Hence, in the absence of the proposed project, the most realistic and credible alternative is alternative 4)

[3] Notice on strictly prohibiting the installation of fuel-fired generators with the capacity of 135MW or below, issued by State Council, 2002
[4] Interim Rules on the Installation and Management of Small-scale Fuel-fired Generators (issued in Aug., 1997).
[5] http://cwera.cma.gov.cn/upload/b_2_left_02.jpg
[6] http://cwera.cma.gov.cn/upload/b_3_left_02.jpg
[7] http://ac.agri.gov.cn/ac/ViewContent.do?id=4affaa20110219f101116d279548047d&year=2007&month=3&right=!ENCODEtkc1vlOItllg1Oe
[8] http://ac.agri.gov.cn/ac/ViewContent.do?id=4affaa20110219f101116d279548047d&year=2007&month=3&right=!ENCODEtkc1vlOItllg1Oe
[9] http://www.86ne.com/Biomass/200712/Biomass_103227.html

Provision of equivalent amount of annual power output by the grid (CCPG) where the proposed project is connected into.

B.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered CDM project activity (assessment and demonstration of additionality):

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The following steps are used to demonstrate the additionality of the project according to the latest version of the "Tool for the demonstration and assessment of additionality" agreed by the Executive Board (Version 05.2, EB39).

Step 1. Identification of alternatives to the project activity consistent with current laws and regulations.

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

The alternatives to the project activity are as follows:

1) The proposed project activity, but not undertaken as CDM project activity;

2) Construction of a fossil fuel-fired power plant with equivalent amount of annual power output;

3) Construction of a power plant using other sources of renewable energy with equivalent amount of annual power output; and

4) Provision of equivalent amount of annual power output by the grid (CCPG) where the proposed project is connected into.

As described in section B.4, the scenario 3) is not a feasible alternative.

Substep 1b. Enforcement of applicable laws and regulations

According to the analysis in section B.4., alternative 2) the construction of a fossil fuel-fired power plant with equivalent amount of annual electricity output would be contrary to the state's laws and regulations, which should be excluded from further consideration. All of the remaining alternatives meet national laws and regulations.
Based on the analysis in the two sub-steps, the alternative 1) and 4) is remaining. Step 2 will analysis alternative 1) is not economically attractive and faces some barriers.

Step 2. Investment analysis.

The purpose of Step 2 is to identify without the revenues from CERs, the economic and financial index of the proposed project is not attractive. The concrete steps for investment analysis are as the following sub steps.

Sub-step 2a. Determine appropriate analysis method.

In the "Tool for the demonstration and assessment of additionality", three options are available for investment analysis: the simple cost analysis, the investment comparison analysis and the benchmark analysis.

The simple cost analysis is not applicable because the project activity will produce economic benefits (from electricity sale) other than CERs income. The investment comparison analysis is applied only if the alternatives are also the investment projects. In the project case, however, the most credible alternative of the proposed project is provision of equivalent amount of annual power output by CCPG. The alternative is not an invested project, which makes the investment comparison analysis unfeasible. The benchmark

Internal Return Rate (IRR) of total investment is available, so the benchmark analysis is chosen and the Project IRR is used to assess the financial viability of the project activity.

Sub-step 2b. Apply benchmark analysis.

In accordance with *Economic Evaluation Code for Small Hydropower Projects* issued by the Ministry of Water Resources in 1995[10] (Document No. SL16-95 and MWR hasn't issued other new *economic evaluation code for small hydropower projects* and the effectiveness of this Code was confirmed with a notice by relevant authority in China[11]), the Project IRR after tax of hydro power projects with installed capacity less than 50MW should not be lower than the benchmark of 10%.

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

Table B.2: Main parameters for the calculation of financial indicators

Item	Unit	Value	Source
Installed capacity	MW	25	*Expand capacity report*[12]
Static Investment	Million Yuan	122.43	*Consultant Evaluation Report* [13]
Operation and maintenance (O&M) cost	Million Yuan	3.97	*Expand capacity report*
Net grid-connected electricity generation	MWh/year	103,830	*Expand capacity report*
Electricity Tariff(Excluding VAT)	Yuan/kWh	0.192	*Expand capacity report*
Value Added Tax (VAT)	%	17	*Expand capacity report*
Town building maintenance tax	%	5	*Expand capacity report*
Surcharge for education	%	3	*Expand capacity report*
Income tax	%	33	*Expand capacity report*
Expected CERs Price	US$/tCO$_2$e	12	*Expected*
Assumed Currency Conversion Factor	-	8:1	-
Operational life time	Year	30	*Expand capacity report*
Construction time of the project activity	Year	2	*Expand capacity report*
CERs crediting time	year	7×3	*Project Owner selection*

There is only one value which not derived from the Expand Capacity Report, the Static Investment. Considering the form process of Static Investment, the reasonable value can be found in the following description. (All the evidences can be seen in the section below in timeline)

The Tiejue project was initiated by the ex-project owner Mabian Jida Hydropower Development Co.,Ltd. in Jun.2004. Due to financial difficulties, construction work of the project was stopped on 10th, Jun.2006. Then on Aug 2006, the ex-project owner asked Chengdu HongCe Engineer Consultant Co.,Ltd who is a chartered expert on financial assessment to assess the financial property of the project[14] at that time so that the project can be sold at a fair market cost. The result of the assessment was that the total investment

[10]http://www.chinawater.net.cn/law/guifan/sl16-95/

[11]http://www.chinawater.net.cn/jishujiandu/CWSNews_View.asp?CWSNewsID=24696

[12]The "Expand Capacity report"was designed by the "Leshan City water conservancy and Power Architecture and Reconnaissance Design Institute" after the Sichuan Jianengjia Power Group Co.,Ltd purchased the proposed project, this report can reflect the realistic information of the project.

[13]Consultant Evaluation Report for the Mabian Tiejue hydropower station designed by Chengdu HongCe Engineer Consultant Co.,Ltd

[14] Financial Property Assessment Report compiled by Chengdu HongCe Engineer Consultant Co.,Ltd in Aug 2006 which was commissioned by Mabian Jida Hydropower Development Co.,Ltd.

was 94.72 million Yuan, including tangible assets 89.15 million Yuan; intangible assets 5.57 million Yuan.

The current project owner Sichuan Jianengjia Power Group Co.,Ltd[15] prepared to purchase the Tiejue project, so in Nov 2006, they also asked Chengdu HongCe Engineer Consultant Co.,Ltd to assess the investment not only by the ex-project owner but also the additional required cost for completion with capacity expansion from 22 to 25MW. The result of the assessment was that the total investment cost by the ex-project owner was 94.72 million Yuan, tangible assets wass 89.15 million Yuan, the additional required cost would be 33.28million yuan. So if the project can be completed, the total investment would be 89.15+33.28=122.43million yuan assessed by the chartered expert on financial assessment.

After the assessment, the current project owner purchased the project from the ex-project owner on 11th, Jan.2007. For the further construction, the current project owner asked the Leshan City water conservancy and Power Architecture and Reconnaissance Design Institute to compile the Expand Capacity Report of the project. In this report, the total investment was estimated to 139.26 million yuan. It was estimated based on the financial assessment report which assessed by Chengdu HongCe Engineer Consultant Co.,Ltd and the price level of that time.

The current project owner purchased the project from the ex-project owner on 11th, Jan.2007, this is the starting date of the proposed project, so before this investment decision, the owner just supposed that they would pay the total investment for this project was 122.43million yuan.

Although the value of Static Investment in the ECR is 142.26million yuan, but the value of 122.43million is used to calculate the IRR as considered more appropriate and conservative.

As for the tariff of 0.192yuan/kWh used in the investment analysis, this value is extracted from the Expand Capacity Report. The actual tariff of the Tiejue project is 0.181yuan/kWh from the PPA which was signed on 7th, Jan.2008. That is the actual tariff is lower than the expected 0.192yuan/kWh in the Expand Capacity Report. So the tariff 0.192yuan/kWh is used to calculate the IRR is appropriate and conservative.

The project IRR is provided in TableB.3.

Table B.3 Project IRR of the proposed project

Item	Project IRR
Without CDM Revenue	8.36%
Benchmark IRR	10%
With CDM Revenue	13.40%

Without the income from CERs, the IRR for total investment of the proposed project is 8.36%, lower than the benchmark IRR set in the<*Economic Evaluation Code for Small Hydropower Projects SL16-95*>, so the proposed project is financially unattractive.

Sub-step 2d. Sensitivity analysis.

Two factors are considered in the following sensitivity analysis complying with the "Guidance on the assessment of investment analysis":

- Static Investment;
- Power Revenue

[15] Sichuan Jianengjia Power Group Co.,Ltd is the holding company of the Mabian Gaozhuoying River Valley Development Co., Ltd. The Mabian Gaozhuoying River Valley Development Co., Ltd is established by the holding company to manage the Tiejue project.

Assuming the above two factors vary in the range of -10% ~+10%, the IRR of the project (without the income from CERs sales) varies to different extents, as shown in Figure B.2 and Table B.4.

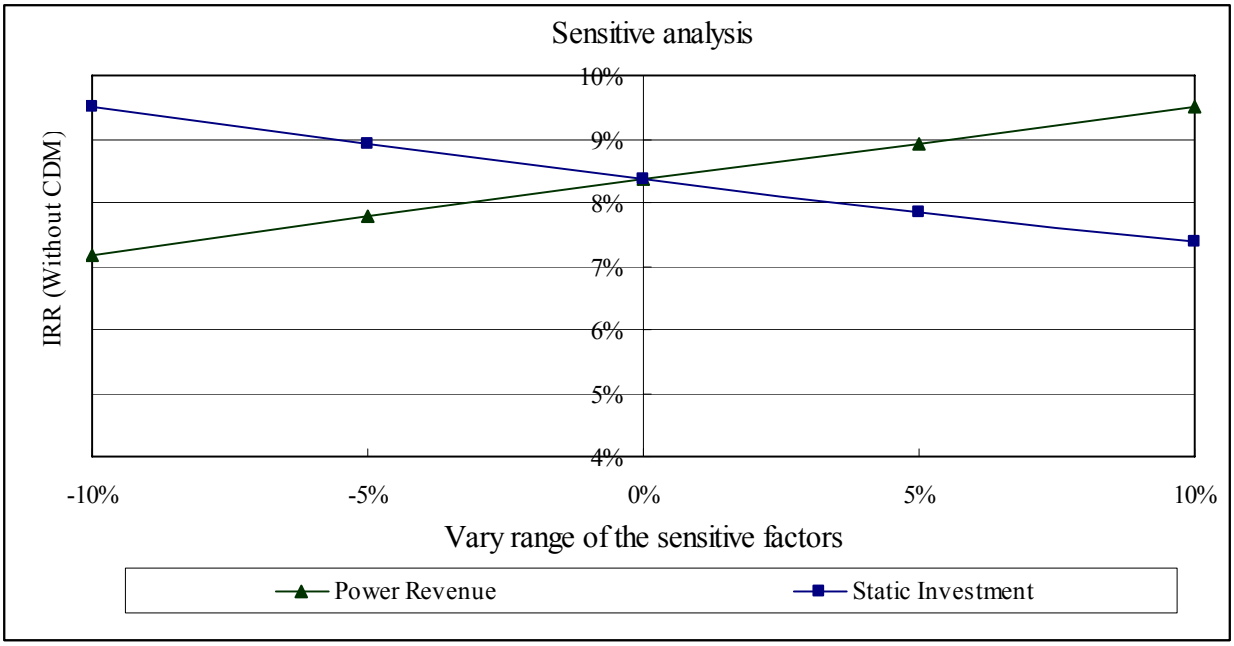

Figure B.2 Sensitive analysis of the proposed project

Table B.4 Sensitive analysis figures of the proposed project

Vary range / Parameters	-10%	-5%	0	+5%	+10%
Static Investment	9.51%	8.91%	8.36%	7.86%	7.39%
Power Revenue	7.18%	7.78%	8.36%	8.94%	9.50%

1) Static Investment

With a variation range (±10%) of the Static Investment, the IRR after-tax of the project fluctuates from 7.39%(+10%) to 9.51%(-10%), not exceed the benchmark 10%.

For the Tiejue project, the 73% static investment was done by the ex-project owner, then the former investment has been fixed. The other 27% should be invested by the current project owner, the value is 33.28million yuan, but actually, the investment by the current project owner is 68.33million yuan. So the investment increased compared to the assessment by the Chengdu HongCe Engineer Consultant Co.,Ltd. And the commodity prices in China keeps the increasing trend during the last few years. So the investment for the project only can increased, not to mention reduced. Therefore, the project is financially unattractive within the reasonable range of the Static Investment.

2) Power Revenue

With a variation range (±10%) of the Power Revenue, the project IRR after-tax of the project fluctuates from 7.18%(-10%) to 9.50%(+10%), not exceed the benchmark 10%.

As described in the section A.4.3, the net grid-connected power generation was estimated and calculated based on the annual power generation, and the annual power generation was estimated based on the on-site historical flow records over 45-year average monthly statistic data (from 1957 to 2002), which is

relatively stable. So the tariff only can indicate the variation of power revenue. The actual tariff of the Tiejue project is 0.181yuan/kWh from the PPA which was signed on 7th, Jan. 2008. So the actual tariff is lower than the expected 0.192yuan/kWh in the Expand Capacity Report. And in China, the grid price can only be effected the governmental documents. Once the grid price is established, it is relatively stable. Therefore, a grid price increase by 10% is extremely unlike.

Just for reference, the IRR is calculated to see the financial status of the project activity under an extremely conservative condition of net grid-connected power generation. The net grid-connected power generation would be 107,288MWh (124,800MWh*90%*99.5%*96%) under the condition that coefficients assumed for the power generation increased from 80% to 90% (the maximum estimation according to SL16-95), 0.5% of plant consumption loss and 4% of transmission line loss. Then the IRR worked out is 8.75%, still below the benchmark of 10%.

Table B.5 Variation to reach the benchmark

	Variation to reach the benchmark (10%)
Static investment	-14%
Power Generation	+15%

With a decrease in the Static Investment by 14%, the project IRR after-tax of the project can reach 10%. With an increase in the power revenue by 15%, the project IRR after-tax of the project will reach 10%.

However, as described above, it is difficult for the total static investment to decrease by 14%, and as for the power revenue, according to the above description, it is difficult for it to increase by 15%.

As shown in the sensitivity analysis, even the above two factors reaches -10% or +10%, the total investment IRR of the Project could not reach the benchmark (10%), only when the Fixed Assets Investment decrease by 14% or power revenue increase by 15%, the IRR of the project can reach the benchmark. But based on the above analysis, these conditions can not be achieved. So the proposed project activity is not financially attractive.

Considering CDM before implementation of the proposed project

The construction of the project activity was started by the former project owner (Mabian Jida Hydropower Development Co.,Ltd) in Jun.2004[16]. Due to lack of money, the former project owner have no capability to continue the project and the construction of the project was suspended on 10th, Jun.2006[17].

The Sichuan Jianengjia Power Group Co.,Ltd wanted to purchased the proposed project as consider CDM on 12th Dec. 2006[18]. In order to get a better knowledge about the geological condition and the investment return ratio of the proposed project, Sichuan Jianengjia Power Group Co.,Ltd entrusted "Leshan City water conservancy and Power Architecture and Reconnaissance Design Institute" to redesign another FSR that is the "Expanded capacity report", to carry out another geological prospecting and exploration and a simple financial analysis for the proposed project. And also the project owner was suggested to apply CDM by this Design Institute[19]. Then Sichuan Jianengjia Power Group Co.,Ltd purchased the

[16] See the Main Equipment Purchase Contract between the Mabian Jida Hydropower Development Co.,Ltd and Fujian Nanping Nandian Hydropower equipment manufacture Co.,Ltd in 06/2004

[17] See the Construction suspend notify for the two construction team "Sichuan Qingshen Qingzhu Architecture Company" and "Sichuan Yinglin Architecture Company" from the Mabian Jida Hydropower Development Co.,Ltd in 10/06/2006.

[18] See the Meeting Minutes of Sichuan Jianengjia Power Group Co.,Ltd in 12/12/2006.

[19] See the Letter of the Suggestion of the Application CDM for Tiejue Project by the Leshan City water conservancy and Power Architecture and Reconnaissance Design Institute in 20/12/2006.

Tiejue Project on 11th, Jan.2007[20] as the CDM revenue can improve the economic indicator. After the purchasing, Sichuan Jianengjia Power Group Co.,Ltd established the Mabian Gaozhuoying River Valley Development Co., Ltd to resume the construction of the Tiejue project. The implementation timeline of the proposed project can be seen in Table B.6.

Table B.6 Timeline of implementation of the proposed project

Time	Milestone	Evidence
02/2004	PDR compiled	The PDR of Tiejue project
03/2004	EIA Compiled	The EIA of Tiejue project
08/03/2004	PDR and EIA all approved	The approval to the PDR and EIA of Tiejue project
06/2004	Started of Tiejue project by ex- owner	Main Equipment Purchase Contract
10/06/2006	Stop of Tiejue project by ex-owner	Construction suspend notify for the two construction team
30/08/2006	Investment by the ex-project owner was assessed	The Financial Property Assessment Report was completed by Chengdu HongCe Engineer Consultant Co. Ltd.
20/10/2006	Holding company commissioned the asset evaluation to Consultant in Chengdu	letter of commitment from the Jianengjia Company to Hongce Company
18/11/2006	Asset evaluation report compiled	The Asset evaluation report was completed by Chengdu HongCe Engineer Consultant Co., Ltd.
12/12/2006 **Serious consideration of the CDM**	Board of Holding company decided on the purchase of Tiejue project with provision of CDM application	Meeting Minutes of Sichuan Jianengjia Power Group Co.,Ltd.
15/12/2006	Holding company commissioned ECR to Leshan Institute	Letter of Consulting Tiejue Project Apply CDM and commissioned a new report to Leshan Institute
20/12/2006	Leshan Institute sent a letter to Holding Company to suggest CDM application	Letter of the Suggestion of the Application CDM for Tiejue Project
11/01/2007	Holding company purchased	The framework agreement of purchasing Tiejue station

[20] The framework agreement of purchasing Tiejue station and Sela station signed between Sichuan Jianengjia Power Group Co.,Ltd and Mabian Jida Hydropower Development Co.,Ltd in 11/01/2007.

Starting date of the project activity	Tiejue project	and Sela station
18/01/2007	Establishment of the project participant approved	The business license of the Mabian Gaozhuoying River Valley Development Co., Ltd
05/2007	ECR compiled	The "Expanded capacity report" compiled by the Leshan City water conservancy and Power Architecture and Reconnaissance Design Institute
18/06/2007	ECR approved	The "Expanded capacity report" approved by DRC of Leshan City

From Table B.6, it can be seen that the CDM was considered by the project owner on 12th, Dec. 2006 which prior to the decision to implement the project activity. Then the project owner asked the Institute to conduct a new design report to reflect the realistic situation of the project, the Institute realize the low IRR of the proposed project, so they give the owner Letter of the Suggestion of the Application CDM to advice the owner consider CDM. After that, the current owner purchased the project on 11th, Jan. 2007. So the CDM was seriously considered by the project owner before the starting date of the proposed project.

The timeline of events and actions which have been taken to achieve CDM registration of the proposed project can be seen in table B.7.

Table B.7 Timeline of achieve CDM registration of the proposed project

Time	Milestone	Evidence
25/01/2007	Commencement of carbon business	Consulting Contract with KOE
10/04/2007	Due diligence by the KOE Company for Tiejue project	The Due diligence report for the Sichuan Tiejue Hydropower Project
07/07/2007	Due diligence by the China Carbon for Tiejue project	The DD-checklist of China Carbon for the Tiejue project
29//01/2008	The determination of CERs buyer	Letter of Interest with China Carbon.
04/04/2008	Signed the Validation Contract with DOE	Validation Contract with JCI
08/04/2008	The PDD of the project GSP in UNFCCC	UNFCCC website

From the table B.7, it can be seen that after the commencement of carbon business, the investigation was done by the KOE on 10th, Apr. 2007 After that, the KOE company negotiated some potential buyers and choose the China Carbon as the most potential buyer for the Tiejue project, then the due diligence was

done by the China Carbon on 7th, Jul, 2007. And finally the LoI was signed between the project owner and the buyer China Carbon on 29th, Jan. 2008. So it can be demonstrated that the continual and real actions were taken to secure CDM status for the project in parallel with its implementation by the project owner.

The benchmark analysis and sensitivity analysis concluded that the proposed project activity is unlikely to be financially attractive.

Step 4. Common practice analysis

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

According to the "Tool for the demonstration and assessment of additionality"(Version 05.2), the common practice provides an analysis of any other activities that are operational and that are similar to 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 regulatory framework, investment climate, access to technology, access to financing, etc. Other CDM project activities (registered project activities and project activities which have been published on the UNFCCC website for global stakeholder consultation as part of the validation process) are not to be included in this analysis.

Projects analyzed in this section are defined as hydropower projects in Sichuan Province with similar installed capacity (15 MW to below 50 MW) that construction started after 10th February 2002.

The reason of choosing the Sichuan province, 15-50MW and construction started after 10th February 2002 can be shown as follows,

1) Choose the Sichuan province as the region.

Sichuan Province with an area of 485,000 km^2, is comparatively and considerably larger than many small countries. According to the requirements of common practice, the projects with similar conditions, such as investment conditions and natural conditions (including geographical conditions, climate conditions, development conditions and so on), are necessary to be analyzed. Projects located in different provinces of Central China Power Grid have not the similar investment conditions[21] and natural conditions[22]. Therefore the geographical area, i.e. Sichuan Province, is chosen as the common practice comparison region.

Based on the source of project, the Yearbook of the China Water Resource 2006 and 2007, there are 49 hydropower projects in Sichuan Province.

2) Choose the projects with similar installed capacity (15 MW to below 50 MW)

Projects within the indicated capacity range are comparable to the project activity both in terms of CDM as well as national regulations because UNFCCC classifies hydropower projects above 15 MW as large scale projects, whereas the Chinese government classifies hydropower stations below 50 MW as small scale projects[23], hence projects within this range are subject to the same set of regulations.

Based on the 49 projects in Sichuan province, there are 25 projects in the range from 15MW to 50MW.

3) Choose the projects construction started after 10th February 2002

[21] Yearbook of China Water Resources 2006

[22] http://www.checc.cn/zgsd/zgsd_zy.jsp,
http://www.checc.cn/shuigis/province/provincedetail.jsp?provinceID=20/19/11/13/14/15,

[23] Almanac of China's Water Power, Volume 10, Page 141: Projects with a capacity below 50 MW (excluding 50MW) are defined as small scale hydropower projects.

The hydropower stations that started construction before 10th February 2002 were developed by the state under a regulatory environment that was substantially different from the current regulatory environment.

According to the document published by The Investment Association of China and available on its Website, there are three stages which were gone through for the China Power Industry:

(1) Prior to 1987: The former State Grid Corporation was the investment body for the electricity investment in China.

(2) From 1988 to the power policy reform in 2002: The State Council of the People's Republic of China approved Notice on the Interim Provisions of imposing the Electricity Constructing Capital (Guofa [1987] No.111) which was issued by the State Planning Commission, and the notice stipulated that the state started to impose the electricity constructing capital through the country to build the large and middle-sized electricity projects listed in the state Plan after 1st January 1988. The levy standard of the electricity constructing capital was 0.02yuan/kWh and the property right of the electricity projects belongs to various provinces, autonomous regions and cities. The wall that State Grid Corporation was the single investment body for the electricity investment was broken down during this stage, the various provinces and cities started to establish electricity investment companies to participate the electricity investment, and the pattern was formed that the former State Grid Corporation and the local government jointly participated in the electricity investment.

(3) On 10th February 2002, the power policy reform was started. That is, the State Council issued the Notice on Issuing Electric Power Sector Reform Programme (Guofa [2002] No.5) and the monopoly of the electricity investment was broken down by separating electric power plants from electric power grids and netting by price-bidding. Diversification of investment body was realized, which brought the results that the investment for small hydropower projects was market–oriented, private enterprises and private funds entered to the small hydropower industry.

Based on 25 projects in Sichuan province between the range 15-50MW, there are only 7 projects construction started after 10th February 2002.

So the seven hydropower stations construction started after 10th February 2002 in Sichuan province with installed capacities from 15MW to 50MW without applying CDM are listed in table B.8[24].

Table B.8 All the projects from 15-50MW that construction started after 10th February 2002 in Sichuan province

No.	Name of project	Capacity (MW)	Operation year	Applying CDM or not	Investor	Company type
1	Yuechi Fuliutan Hydropower Station	39	2002	No	Yuechi Fuliutan Electric Power Co.,Ltd.	State holding company[25]
2	Longdonggou Hydropower Station	26.25	2002	No	Chongqing Yuyuan Hydropower Development Co.,Ltd	State holding company[26]
3	Niujiaowan Third Level Hydropower Station	25	2003	No	Sichuan Xichang Electric Power Co.,Ltd.	State holding company[27]
4	Tongkou Hydropower Station	45	2004	No	Beichuan County Electric Power Co.,Ltd	State-owned enterprise[28]

[24] Data source: Yearbook of China Water Resource 2006 and 2007.
[25] http://www.chinarein.com/qkhc/detail.asp?id=781
[26] http://www.zgsdzx.cn/MemberCompany/ViewCompanyDetail.aspx?userid=12
[27] Sichuan Xichang Electric Power Co., Ltd. Report in 2003
[28] http://www.hsm.com.cn/node2/node116/node120/node334/node336/userobject6ai4672.html

5	Sanjiang Hydropower Station	45	2004	No	Meiya Electric Power Co.,Ltd (U.S.)	Foreign Capital[29]
6	Baishuihe Hydropower Station	26	2004	No	Shimian Kaiyuan Electric Co.,Ltd	Private owned
7	Shazui Hydropower Station	38	2004	No	Hongchang Electric Power Co.,Ltd	Private owned

As described above, based on the three definition limited, there are seven hydropower stations in Sichuan province **construction started after 10th February 2002** with installed capacities from 15MW to 50MW without applying CDM. Based on the list, the first five projects enjoyed significantly better economical environment than the proposed project, either invested by the government or the foreign capital. So there are only two projects which also invested by the private company similar to the project.

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

Based on the description above, there are only two projects which similar to the project. See the Table B.9

Table B.9 The information of the hydro power projects similar to the proposed project

No.	Name of project	Capacity (MW)	Operation year	Applying CDM or not	Investor
1	Baishuihe Hydropower Station	26	2004	No	Shimian Kaiyuan Electric Co.,Ltd
2	Shazui Hydropower Station	38	2004	No	Hongchang Electric Power Co.,Ltd

There are some major distinctions between the proposed project and the other two projects, see table B.10 for the detail information.

Table B.10 The distinctions between the proposed project and similar projects

Project / Item	Tiejue	Baishuihe	Shazui
Installed Capacity(MW)	25	26	38
Annual Operation Hours	4,990	6,633[30]	6,374[31]
Tariff (RMB/kWh)	0.192	0.288[33]	0.288[32]

The main distinction among the proposed project and other two similar projects can be seen from the table B.10. For some key parameters of the project, the proposed project can not compare to the other projects. To the annual operation hours, Baishuihe project is 33% larger than the project, and Shazui project is 28% larger. To the Tariff, Both of the two projects can sale the power to the Sichuan provincial grid directly. So their tariffs were decided by the Price Bureau of Sichuan Province. According to the regulation of the Sichuan Province Government, the tariff is 0.288yuan/kWh. But for Tiejue project, the power is sold to the Mabian grid, not the provincial grid. So the tariff is decided by the power buyer, the realistic tariff is 0.181yuan/kWh.

Based on the description above, the Baishuihe and Shazui project with high annual operation hours and high tariff is financially more advantageous than the proposed project. The proposed project does not have the comparability to the two similar projects.

So the proposed activity is not a common practice in the region.

[29]http://www.chinapower.com.cn/article/1008/art1008831.asp
[30]Yearbook of China Water Resources 2006, P576
[31] http://www.gzz.gov.cn/hongchang/
[32]http://www.scpi.gov.cn/zcfg/zcfg-content.asp?id=1057 No.55、56

Through the three steps, it can be demonstrated that the proposed project is additional.

B.6. Emission reductions:

B.6.1. Explanation of methodological choices:

According to ACM0002 (version 7), the emission reduction can be calculated using the following steps:

1) Project emissions calculation.
2) Baseline emissions calculation.
3) Leakage calculation.
4) Emission reductions calculation.

1) Project Emissions

The proposed project is a new hydropower plant with a run-of-river reservoir, according to the ACM0002, the power density of the project activity is calculated as follows,

$$PD = \frac{Cap_{PJ} - Cap_{BL}}{A_{PJ} - A_{BL}} \quad (1)$$

Where:

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

For the project is a new hydro power plant, so the Cap_{BL} and A_{BL} are both zero.

The Cap_{PJ} is 25,000,000W for the Tiejue project, and the area of the reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir is full, A_{PJ}[33] is 16,665m^2.

Thus the power density of the project is 25,000,000W/16,665m^2=1,500W/m^2> 10W/m^2, according to ACM0002, the project emission is neglected;

2) Baseline Emissions

According to ACM0002 (version 7), baseline emissions are equal to the net power supplied to the grid multiplied by the baseline emission factor $EF_{grid,CM,y}$, calculated as follows:

$$BE_y = (EG_y - EG_{baseline}) \times EF_{grid,CM,y}$$

Where:

[33] The data is sourced from the Expand Capacity Report.

EG_y is net electricity supplied by the project activity to the grid (MWh);

$EG_{baseline}$ is baseline electricity supplied to the grid in the case of modified or retrofit facilities (MWh). The project is a new power plant, according ACM0002, $EG_{baseline} = 0$;

$EF_{grid,CM,y}$ is combined margin CO_2 emission factor for the CCPG in year y, and is calculated according to "Tool to calculate the emission factor for an electricity system" Version 01.1.

The baseline emission factor ($EF_{grid,CM,y}$) is calculated ex-ante as the simple average of the operating margin emission factor ($EF_{OM,y}$) and the build margin emission factor ($EF_{BM,y}$). In accordance with the "Tool to calculate the emission factor for an electricity system"(version01.1), the baseline emission factor can be calculated with the following steps described below.

Step 1: Identity the project electric system

According to the "Tool to calculate the emission factor for an electricity system", the data published by the Office of the National Coordination Committee on Climate Change of China is selected. Therefore, in accordance to the latest delineation of China on July 18th, 2008, China Centre Power Grid (CCPG) is identified as the electric power system, from which would provide electricity in baseline scenario. The spatial extent of the CCPG comprises all the power plants connected physically to the China Centre Grid, which includes Henan Provincial Power Grid, Hubei Provincial Power Grid, Hunan Provincial Power Grid, Jiangxi Provincial Power Gird, Sichuan Provincial Power Grid and Chongqing City Power Grid.

Step 2: Select an operating margin method (OM)

The Operating Margin Emission Factor ($\boldsymbol{EF_{OM,y}}$) based on one of the four following methods:

(a) Simple OM, or

(b) Simple adjusted OM, or

(c) Dispatch data analysis OM, or

(d) Average OM.

Any of the four methods can be used, however, the simple OM method (option a) can only be used if low-cost/must-run resources constitute less than 50% of total grid generation in: 1) average of the five most recent years, or 2) based on long-term averages for hydroelectricity production. Among the total electricity generations of the CCPG which the Project is connected into, the share of the low-cost/must run[34] resources in CCPG are 35.95% in 2002, 34.42% in 2003, 38.54% in 2004, 38.18% in 2005, and 40.64% in 2006(See annex 3 for details). Any value for the latest 5 years is noticed less than 50%[35]. Thus, the method (a) Simple OM can be used to calculate the baseline emission factor of operating margin ($\boldsymbol{EF_{OM,y}}$) for the Project. Other methods other than Simple OM cannot be applied with appropriate justification.

For the simple OM, the emissions factor is selected to be calculated using either of the data vintages between any of: Ex ante option or Ex post.

For this PDD Ex ante option is selected, which is a 3-year generation-weighted average, based on the most recent data available at the time of submission of the CDM-PDD to the DOE for validation, without requirement to monitor and recalculate the emissions factor during the crediting period. So the $EF_{grid,CM,y}$ will continue been used as the value in GSP version PDD.

[34]Low operating cost and must run resources typically include hydro, geothermal, wind, low-cost biomass, nuclear and solar generation. If coal is obviously used as must-run, it should also be included in this list, i.e. excluded from the set of plants.

[35] China Electric Power Yearbook, 2003-2007 editions

Step 3: Calculate the operating margin emission factor according to the selected method.

In accordance with the "Tool to calculate the emission factor for an electricity system", the simple OM emission factor is calculated as the generation-weighted average CO_2 emissions per unit net electricity generation (tCO_2/MWh) of all generating power plants serving the system, not including low-cost / must-run power plants / units. It may be calculated:

- Based on data on fuel consumption and net electricity generation of each power plant / unit (Option A), or
- Based on data on net electricity generation, the average efficiency of each power unit and the fuel type(s) used in each power unit (Option B), or
- Based on data on the total net electricity generation of all power plants serving the system and the fuel types and total fuel consumption of the project electricity system (option C)

According to the "Tool", Option A should be preferred and must be used if fuel consumption data is available for each power plant/unit. However, the fuel consumption and net electricity generation data for each power plant/unit is not available, therefore, Option A and Option B is not available. Option C is adopted and accordingly only nuclear and renewable power generations are considered as low-cost/must-run power sources and data of the quantity of electricity supplied to the grid by these sources should be available.

As per Option C, the simple OM emission factor is calculated based on the net electricity supplied to the grid by all power plants serving the system, not including low-cost/must-run power plants/units, and based on the fuel type(s) and total fuel consumption of the project electricity system, as follows:

$$EF_{OM,simple,y} = \frac{\sum_i FC_{i,y} \times NCV_{i,y} \times EF_{CO_2,i,y}}{EG_y} \quad (2)$$

Where:

$EF_{OM,simple,y}$	Simple operating margin CO_2 emission factor in year y (tCO_2/MWh)
$FC_{i,y}$	Amount of fossil fuel type i consumed in the project electricity system in year y, (mass or volume unit)
$NCV_{i,y}$	Net calorific value(energy content)of fossil fuel type i in year y (GJ/mass or volume unit)
$EF_{CO2,i,y}$	CO_2 emission factor of fossil fuel type i in year y (tCO_2/GJ)
EG_y	Net electricity generated and delivered to the grid by all power sources serving the system, not including low-cost/must-run power plants/units, in year y (MWh)
i	All fossil fuel types combusted in power sources in the project electricity system 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

For this approach (simple OM) to calculate the operating margin, the subscript m refers to the power plants / units delivering electricity to the grid, not including low-cost/must-run power plants / units, and including electricity imports to the grid. Electricity imports should be treated as one power plant m. To the CCPG which the project connected to, there is no imported electricity from other Grids.

With reference to the *Notification on Determining Baseline Emission Factor of China's Grids* issued by Chinese DNA on August 9th, 2007 on http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File1364.pdf, the

Simple OM emission factor ($EF_{OM,y}$) of the CCPG is calculated as 1.2899 tCO_2e/MWh (see Annex 3 for details).

Step 4: Identity the cohort of power units to be included in the build margin

The sample group of power units *m* used to calculate the build margin consist of ether:

(a) The set of five power units that have been built most recently, or

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

Due to the information of the five power plants built most recently in each regional gird of China is not available. Therefore, the sample group of power units *m* used to calculate the build margin is chosen (b). According to the EB's guidance on DNV deviation request, "Request for clarification on use of approved methodology AM0005 for several projects in China", the EB accepted the following deviation (See step 5). Since methodology AM0005 has been replaced by and incorporated into the consolidated methodology ACM0002, the deviation above is also applicable to the consolidated methodology ACM0002.

An ex-ante option has already been selected in the Step 2 of the PDD. In terms of vintage of data, Option 1 is chosen:

Option1. For the first crediting period, calculate the build margin emission factor ex-ante based on the most recent information available on units already built for sample group m at the time of CDM-PDD submission to the DOE for validation. For the second crediting period, the build margin emission factor should be updated based on the most recent information available on units already built at the time of submission of the request for renewal of the crediting period to the DOE. For the third crediting period, the build margin emission factor calculated for the second crediting period should be used. This option does not require monitoring the emission factor during the crediting period.

Step 5: Calculate the build margin (BM) emission factor:

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

$$EF_{BM,y} = \frac{\sum_m EG_{m,y} \times EF_{EL,m,y}}{\sum_m EG_{m,y}} \quad (3)$$

Where:

$EF_{BM,y}$	Build margin CO_2 emission factor in year *y* (tCO_2/MWh)
$EG_{m,y}$	Net quantity of electricity generated and delivered to the grid by power unit *m* in year *y* (MWh)
$EF_{EL,m,y}$	CO_2 emission factor of power unit m in year y (tCO_2/MWh)
m	Power units included in the build margin

The sample group of power units *m* used to calculate the build margin is chosen (b) in step 4. According to the EB's guidance on DNV deviation request, "Request for clarification on use of approved methodology AM0005 for several projects in China", the EB accepted the following deviation[36]:

- Use of capacity additions during last 1-3 years for estimating the build margin emission factor for grid electricity;
- Use the efficiency level of the best technology commercially available in the provincial/regional or national grid of China, as a conservative proxy, for each fuel type in estimating the fuel consumption to estimate the build margin (BM).

Since methodology AM0005 has been replaced by and incorporated into the consolidated methodology ACM0002, the deviation above is also applicable to the consolidated methodology ACM0002.

In accordance with the "Tool to calculate the emission factor for an electricity system", the CO_2 emission factor of each power unit m ($EF_{EL,m,y}$) should be determined as per the guidance of options B1, B2 or B3 to calculate the simple OM, using for *y* the most recent historical year for which power generation data is available, and using for m the power units included in the build margin.

Due to for a power unit *m* only data on electricity generation and the fuel types used is available in China, so the emission factor should be determined using Option B2 based on the CO_2 emission factor of the fuel type used and the efficiency of the power unit.

Therefore, $\boldsymbol{EF_{grid,BM,y}}$ should be calculated by the above method, the calculation formula is:

$$EF_{grid,BM,y} = \frac{\sum_{m} CAP_{fossil,y-s}}{\sum_{m} CAP_{y-s}} \times EF_{EL,fossil,y} \quad (4)$$

Where:

$\Sigma CAP_{fossil,y-s}$	Total capacity additions of fossil fuel fired power of CCPG from year *s* to year *y*,
ΣCAP_{y-s}	Total capacity additions of CCPG from year *s* to year *y*,
$EF_{EL,fossil,y}$	The emission factor for fossil fuel fired power of CCPG with the efficiency level of the best technology commercially available,
y	Mostly recent year that the relevant data can be obtained publicly,
s	Determined by: Starting from year *y*, the differences of total installed capacity of the grid between year *y* and year *y*-1, year *y* and year *y*-2, …year *y* and year *y*-*s*, year *y* and year *y*-*s*-1, …are calculated respectively, and then divided by the installed capacity of *y* year. The year that can make the left-hand side of the following formula greater than 20% will be regarded as *s*. The formula is as follows: $\Sigma CAP_{y-s}/\Sigma CAP_{y}$ (see Annex 3 for detailed information)

The types of fossil fired power include coal-fired, oil-fired and gas-fired power, so the emission factor for fossil fuel fired power with the efficiency level of the best technology commercially available is calculated as follows:

$$EF_{BL,fossil,adv,y} = \lambda_{Coal} \times EF_{Coal,Adv,y} + \lambda_{Oil} \times EF_{Oil,Adv,y} + \lambda_{Gas} \times EF_{Gas,Adv,y} \quad (5)$$

Where:

[36] Http://cdm.unfccc.int/Projects/Deviations.

λ_i is the different kinds of fuel emission share of total Emissions in CCPG. *Coal, Oil* and *Gas* is the feet for solid fuels, liquid fuels and gas fuels.

It is calculated as follows:

$$\lambda_{Coal} = \frac{\sum_{i \in COAL, j} F_{i,j,y} \times COEF_{i,j}}{\sum_{i,j} F_{i,j,y} \times COEF_{i,j}} \quad (6)$$

$$\lambda_{Oil} = \frac{\sum_{i \in OIL, j} F_{i,j,y} \times COEF_{i,j}}{\sum_{i,j} F_{i,j,y} \times COEF_{i,j}} \quad (7)$$

$$\lambda_{Gas} = \frac{\sum_{i \in GAS, j} F_{i,j,y} \times COEF_{i,j}}{\sum_{i,j} F_{i,j,y} \times COEF_{i,j}} \quad (8)$$

Where:
$F_{i,j,y}$ is the amount of fuel *i* consumed (in a mass or volume unit) by relevant provincial sub-grids *j* in year *y*;

$COEF_{i,m}$ is the CO_2 emission coefficient (tCO_2e / a mass or volume unit) of fuel *i*, taking into account the carbon content of the fuels used by plant *m* and the percent oxidation of the fuel in year *y*; *Coal, Oil* and *Gas* is the feet for solid fuels, liquid fuels and gas fuels.

$EF_{Coal,Adv}$, $EF_{Oil,Adv}$ and $EF_{Gas,Adv}$ in formula(4) represent the related Emission Factor of the commercially available most advanced coal, oil and gas fired power technology, which shall be determined using Option B2, as follows:,

$$EF_{coal,adv,y} = \frac{COEF_{coal}}{\eta_{coal,adv}} \times 3.6 \quad (9)$$

$$EF_{oil,adv,y} = \frac{COEF_{oil}}{\eta_{oil,adv}} \times 3.6 \quad (10)$$

$$EF_{gas,adv,y} = \frac{COEF_{gas}}{\eta_{gas,adv}} \times 3.6 \quad (11)$$

Where:

η_{Adv} Net energy conversion efficiency of the best thermal power technology commercially. *Coal, Oil* and *Gas* is the feet for solid fuels, liquid fuels and gas fuels.

With reference to the Notification on Determining Baseline Emission Factor of China's Grid, the weighted average fuel consumption for power generation of 15 sets of 600 MW sub-critical coal-fired power generators built in 2005 (343.33 gCe/kWh) and the 200 MW oil/gas based combined cycle power generators (258 gCe/kWh) are taken as the efficiency level of the best technology commercially available

in China.

With reference to the *Notification on Determining Baseline Emission Factor of China's Grids* issued by Chinese DNA on August 9th, 2007 on http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File1364.pdf, the result of BM which calculated by the PDD author for CCPG is 0.6146tCO_2e/MWh.

Step 6. Calculate the combined margin emissions factor

The baseline emission factor is the weighted average of the Operating Margin emission factor ($EF_{OM,y}$) and the Build Margin emission factor ($EF_{BM,y}$):

$$EF_y = w_{OM} \cdot EF_{OM,y} + w_{BM} \cdot EF_{BM,y} \quad (12)$$

Where:

$EF_{BM,y}$	Power units included in the build margin
$EF_{OM,y}$	Operating margin CO_2 emission factor in year y (tCO_2/MWh)
w_{OM}	Weighting of operating margin emissions factor (%)
w_{BM}	Weighting of build margin emissions factor (%)

Where the weight w_{OM} and w_{BM} by default, are 50%.

The proposed project adopts the default weight. Based on the emission factors calculated in the previous 5 steps, the baseline emission factor is $EF_y=EF_{OM,y}/2+ EF_{BM,y}/2$=0.9523 t$CO_2$e/MWh.

Baseline emissions

Baseline emissions are calculated with combined baseline emission factor and the electricity delivered to the grid by the project as follows:

$$BE_y = EG_y \times EF_y \quad (13)$$

Where:

EG_y is net grid-connected electricity generation by the proposed project supplied to CCPG in year *y*.

$EG_y=EG_{output,y}-EG_{input,y}$

$EG_{output,y}$ is is annual on-grid electricity supplied to CCPG by the proposed project in year *y*.

$EG_{input,y}$ is annual on-grid electricity purchased from CCPG by the proposed project for the plant operation in year *y*.

3) Leakage

The proposed project is a hydro power project, and according to ACM0002, the leakage emissions are zero, L_y=0.

4) Emission Reduction

The emission reductions (ER_y) by the project activity are the difference between baseline emissions (BE_y), project emissions (PE_y) and leakage emissions (L_y), as follows: $ER_y=BE_y-PE_y-L_y$

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

As described above, the emission factor of CCPG in this PDD adopts the Report on Determination of Baseline Grid Emission Factor by China DNA NDRC.

Data / Parameter:	NCV_i
Data unit:	TJ/mass or volume unit of a fuel
Description:	The net calorific value per mass or volume unit of a fuel *i*
Source of data used:	China Energy Statistical Yearbook 2005, pg 365
Value applied:	Please refer to Annex 3
Justification of the choice of data or description of measurement methods and procedures actually applied :	Official Statistical Data
Any comment:	Reasonable

Data / Parameter:	$FC_{i,y}$
Data unit:	Mass or volume unit
Description:	Amount of fuel *i* (in a mass or volume unit) consumed by project electricity system in year(s) *y*
Source of data used:	China Energy Statistical Yearbook
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 "Tool to calculate the emission factor for an electricity system", the proposed project uses the national values
Any comment:	Accurate

Data / Parameter:	EG_y
Data unit:	MWh
Description:	Net electricity generated and delivered to the grid by all power sources serving the system, not including low-cost/must-run power plant/units, in year y (MWh)
Source of data used:	China Electric Power Yearbook
Value applied:	Please refer to Annex 3
Justification of the choice of data or description of measurement methods and procedures actually applied :	This kind of data accords with the "Tool to calculate the emission factor for an electricity system"
Any comment:	Reasonable (calculated from the electricity generation and the rate of electricity self-consumption)

Data / Parameter:	$\eta_{m,y}$
Data unit:	-
Description:	Average net energy conversion efficiency of power unit m in year *y*
Source of data used:	National official data sources
Value applied:	For the detailed information please see the Report on Determination of Baseline Grid Emission Factor by China DNA NDRC at http://cdm.ccchina.gov.cn.
Justification of the choice of data or description of	This kind of data accords with the "Tool to calculate the emission factor for an electricity system" and the clarifications for some proposed projects in

measurement methods and procedures actually applied :	China.
Any comment:	Reasonable

Data / Parameter:	$EF_{CO_{2,i}}$
Data unit:	tCO_2e/TJ
Description:	the CO_2 emission factor per unit of energy of the fuel *i*
Source of data used:	IPCC 2006
Value applied:	For the detailed information please see the Report on Determination of Baseline Grid Emission Factor by China DNA NDRC at http://cdm.ccchina.gov.cn.
Justification of the choice of data or description of measurement methods and procedures actually applied :	IPCC Default Value
Any comment:	To calculate OM and BM

Data / Parameter:	$\boldsymbol{CAP}_{,i,y}$
Data unit:	MW
Description:	Installed capacity of source *j* in year *y* in Central China Power Grid
Source of data used:	China Electric Power Yearbook 2004-2006
Value applied:	Please refer to Annex 3
Justification of the choice of data or description of measurement methods and procedures actually applied :	Official Statistical Data
Any comment:	-

Data / Parameter:	$\boldsymbol{Cap}_{BL}$
Data unit:	W
Description:	Install Capacity of the hydro power plant before the implementation of the project activity.
Source of data used:	-
Value applied:	For the project is a new hydropower plant, this value is zero.
Justification of the choice of data or description of measurement methods and procedures actually applied :	Determine the installed capacity based on recognized standards.
Any comment:	-

Data / Parameter:	$\boldsymbol{A}_{BL}$
Data unit:	m^2
Description:	Area of the reservoir measured in the surface of the water, before the implementation of the project activity, when the reservoir is full.
Source of data used:	-

Value applied:	For the project is a new hydropower plant, this value is zero.
Justification of the choice of data or description of measurement methods and procedures actually applied :	Measured from topographical surveys, maps, satellite pictures, etc.
Any comment:	-

B.6.3 Ex-ante calculation of emission reductions:

Based on the formula in section B.6.1, the results of combined margin baseline emission factor of CCPG are as follows:

- $EF_{OM,y}$: 1.2899tCO_2e/MWh;
- $EF_{BM,y}$: 0.6146tCO_2e /MWh;
- $EF_{grid,CM,y}$: 0.9523tCO_2e /MWh.

The annual grid-connected power generation is estimated to be 103,830MWh. So the estimated annual baseline emission of the proposed project is $BE_y=EG_y\times EF_{grid,CM,y}=(EG_{output,y}-EG_{itput,y})\times EF_{grid,CM,y}$= 98,877 t$CO_2$e.

The proposed project is a hydropower project with run-of-river reservoir and the power density>10w/m^2 that the project emissions should not be considered as per ACM0002, i.e. PE_y=0tCO_2e

The proposed project is a hydro power project, and according to ACM0002, the leakage emissions are zero, L_y=0.

The emission reductions (ER_y) by the project activity are the difference between baseline emissions (BE_y), project emissions (PE_y) and leakage emissions (L_y), as follows: $ER_y=BE_y-PE_y-L_y$ =98,877 tCO_2e.

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

Table B.11 The estimation of the emission reductions in crediting period

Year	*Estimation of project activity emission (tCO_2e)*	*Estimation of baseline emission (tCO_2e)*	*Estimation of Leakage emission (tCO_2e)*	*Estimation of Overall emission reductions (tCO_2e)*
01/08/2009-31/12/2009	*0*	*41,199*	*0*	*41,199*
2010	*0*	*98,877*	*0*	*98,877*
2011	*0*	*98,877*	*0*	*98,877*
2012	*0*	*98,877*	*0*	*98,877*
2113	*0*	*98,877*	*0*	*98,877*
2014	*0*	*98,877*	*0*	*98,877*
2015	*0*	*98,877*	*0*	*98,877*
01/01/2016-31/07/2016	*0*	*57,678*	*0*	*57,678*
Total (tCO_2e)	*0*	*692,139*	*0*	*692,139*

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

B.7.1 Data and parameters monitored:

Data / Parameter:	**EG_y**
Data unit:	MWh
Description:	Annual net on-grid electricity supplied to CCPG by the proposed project in year *y*.
Source of data to be used:	Project activity site.
Value of data	103,830
Description of measurement methods and procedures to be applied:	Two-way ammeters with 0.5 Level will be installed at the power output point of the power plant to measure the amount of electricity supplied to the grid $EG_{output,y}$ by the positive direction and the amount of the electricity purchased from the grid $EG_{input,y}$ by the negative direction. While EG_y is calculated by difference of $EG_{output,y}$ and $EG_{input,y}$. The readings of electricity meter will be hourly measured and monthly recorded. Automatic measurement and automatic recording will be made by computers. Double checking by the invoice. Electronic data will be archived within the crediting period and 2 years after the end of the crediting period.
Monitoring frequency:	Hourly measurement and monthly recording
QA/QC procedures to be applied:	The uncertainty level of this data is low. The measurement/ monitoring equipment should adopt the colligated automation system complying with state standard such as DL/T448-2000. These equipment and systems should be calibrated and checked every year.
Any comment:	Refer to B.7.2. Description of the monitoring plan

Data / Parameter:	TEG_y
Data unit:	MWh
Description:	Total electricity produced by the project activity, including the electricity supplied to the grid and the electricity supplied to internal loads, in year *y*.
Source of data to be used:	Project activity site
Value of data	According to the real measurement
Description of measurement methods and procedures to be applied:	Electricity will be measured directly and continuously by computed and precise ammeters. Recording frequency will be hourly measurement and monthly recording; proportion of data to be monitored would be 100% throughout whole year; the data will be archived both in electronic and paper; data monitored are to be kept for two years after the last issuance of CERs for the proposed project activity.
Monitoring frequency:	Hourly measurement and monthly recording
QA/QC procedures to be applied:	Set up a special CDM project team; constitute detailed rules on monitoring management; introduce precision ammeters; three ammeters installed record power generation from each generator
Any comment:	Refer to B.7.2. Description of the monitoring plan

Data / Parameter:	Cap_{PJ}
Data unit:	W
Description:	Installed capacity of the hydro power plant after the implementation of the project activity.
Source of data to be	Project site

used:	
Value of data	25,000,000W
Description of measurement methods and procedures to be applied:	Verified on site
Monitoring frequency:	Yearly
QA/QC procedures to be applied:	-
Any comment:	Refer to B.7.2. Description of the monitoring plan

Data / Parameter:	A_{PJ}
Data unit:	m^2
Description:	Area of the reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir is full.
Source of data to be used:	Measured
Value of data	The A_{PJ} of the project is 16,665m^2.
Description of measurement methods and procedures to be applied:	The A_{PJ} will be calculated using the design schematics and area maps. Photographs of the reservoir at several key locations will be taken when the project becomes operational to check whether the actual reservoir does not deviate substantially for the design.
Monitoring frequency:	-
QA/QC procedures to be applied:	
Any comment:	

B.7.2 Description of the monitoring plan:

In order to effectively monitor and acquire the real, measurable and long-term greenhouse gas (GHG) emission reductions generated by the proposed project, the project owner have established the credible, transparent and adequate monitoring plan, and set up the whole system of data estimation, measurement, tracking, collection and filing. The project owner have organized a special CDM project department and authorized the CDM project manager to take charge of the monitoring activity.

1. The structure of the CDM project department

The proposed project owner had established a CDM management department and appointed the CDM manager to take charge of monitoring. The structure of the CDM department is shown in the following figure.

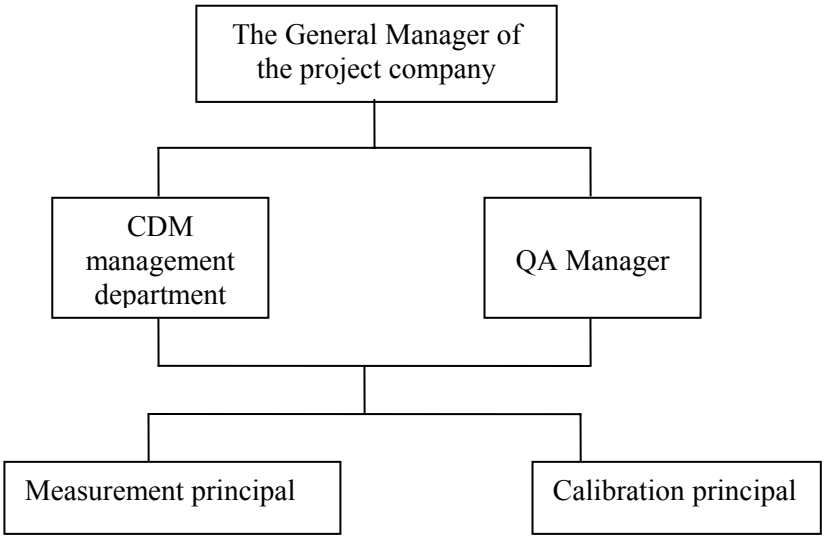

Figure B.3 the structure of the CDM project department

All other CDM monitoring staffs have clearly defined roles and responsibilities. The CDM Manager manages the process of training new staff, ensuring trained staffs perform the monitoring duties and that where trained monitoring staffs are absent, and the integrity of the monitoring system is maintained by other trained staff.

A formal set of monitoring procedures had been established prior to the implementation of the project. These procedures detail the organization, control and steps required for certain key monitoring system features, including:

1) CDM staff training

2) Data management systems

3) CDM data QA/QC

4) Electricity meter maintenance/ calibration

5) Equipment failure

The CDM Manager is responsible for ensuring that the procedures are followed on site and for continuously improving the procedures to ensure a reliable monitoring system is established.

All staff involved in the CDM project received some relevant training from the project consulting company laid down in training procedures agreed on by the project developer. The CDM Manager ensures that only trained staffs are involved in the operation of the monitoring system.

Besides the CDM training, the operator should also need to be trained the operating and maintenance technology for the normal running of the project. So the employees of the project were trained, and the training course covers: introduction of basic theory; maintenance and repair of power connection system; computer monitoring of hydropower station; safety operating regulation; distribution regulation; maintenance and repair of turbines and generators, auxiliary equipment and automatization of turbines and generators; operating, management experience and many kinds of rules for hydropower stations, visiting hydropower station, and so on.

Furthermore, the project owner set a series of regulations for guaranteeing normal operating and maintenance of the project, such as, examine and encouragement scheme to trained staff, management regulations, emergency plan, and so on.

2. Monitoring data

The main monitoring data are:

1. EG_y (Annual net electricity supplied to CCPG by the proposed project in year y). while it is calculated by difference of $EG_{output,y}$ and $EG_{input,y}$.
2. TEG_y (Total electricity produced by the project activity, including the electricity supplied to the grid and the electricity supplied to internal loads).
3. Cap_{PJ} (Installed capacity of the hydro power plant after the implementation of the project activity).
4. A_{PJ} (Area of the reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir is full).

Since the baseline emission factor is fixed by Ex-ante calculation, the net grid-connected electricity generation by the proposed project supplied to CCPG EG_y is calculated by difference of $EG_{output,y}$ and $EG_{input,y}$ above.
The Cap_{PJ} and A_{PJ} will be checked annually according to the methodology.

3. Monitoring equipment and installation

According to the *Technical Administrative Code of Electric Energy Metering (DL/T448-2000),* the electric energy metering equipment will be properly configured, and the metering equipment will be checked by both the project owner and the grid company before the project is in operation.

Main meter (M1, accuracy degree is 0.5S, two-direction) is employed at the exit of the booster station of the proposed project to measure annual net on-grid electricity supplied to CCPG by the proposed project EG_y.

It was agreed with the connecting grid that the reading of the main meter (M1) is to be used also for power sale transaction after deduction of a transmission loss (1.9%).

Meters (M2 and M3) are employed for TEG_y monitoring.

A schematic diagram to describe the wire connection has been shown in the Fig 4.

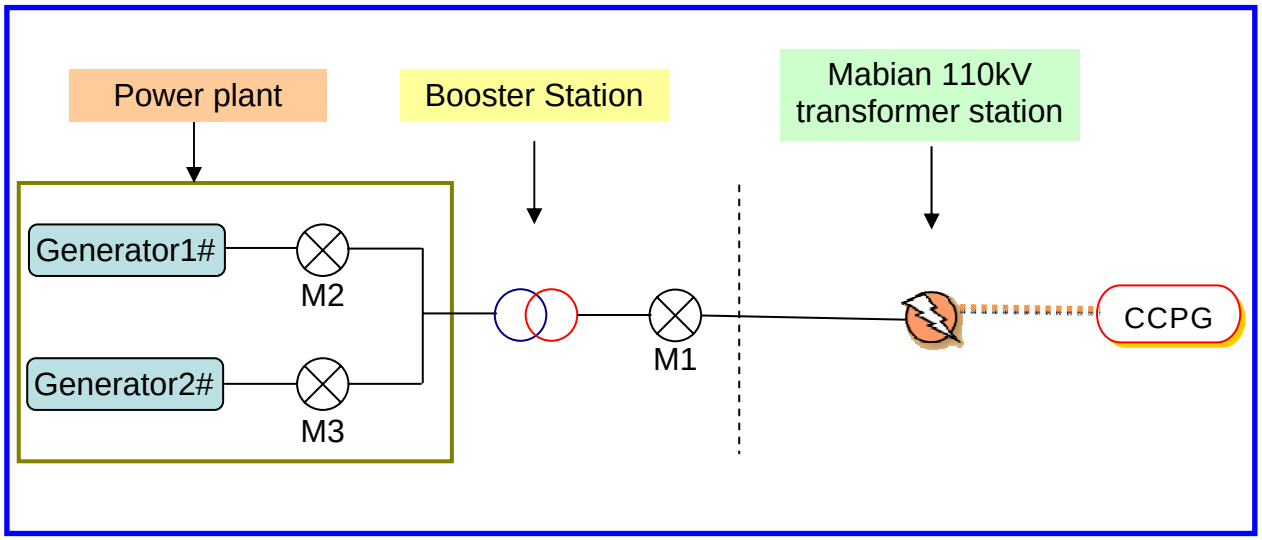

Figure B.4 the Wire Connection Diagram of the project

4. Data Collection

The process for collecting the electricity meter data will be detailed in a procedure. A summary of this procedure is provided below.

Data of meters

The project owner and the Grid Company are responsible for operation monitoring of meters respectively, they should guarantee the measure equipment favorable with integrate seal.

The main monitoring processes are as follows:

i. The monitoring staffs record the daily data of each meter through the hand-written copy. If there are something wrong among the records of the meters, they will ask the relevant authority to calibrate and maintain the meters immediately to avoid uncertainty data is recorded.

ii. The project owner and Grid Company read and check the main meter and record the data in 23:00 on 25th of every month[37];

iii. The project owner provides an electricity sales invoice to the Grid Company. A copy of the invoice is stored by the project owner, together with a record of the payment by the grid company;

iv. The Grid Company provides an electricity purchases invoice to the project owner and the invoice is stored by the project owner;

v. The project owner records the net electricity supplied to the grid;

vi. The project owner keeps and safeguards the records of the main meter's data readings for verification by the DOE.

The numbering of the metering equipment refers to Figure B.4 which shows the location of each meter.

Data of Cap_{PJ} and A_{PJ}

The Cap_{PJ} and A_{PJ} will be checked annually according to the methodology.

Damages to metering equipment:

1. **In case Main meter (M1) is damaged only:**

In case the Main Meter M1 is damaged and no reliable readings can be recorded, the Project Owner will use the following procedure to calculate the EG_y:

The meters (M2 and M3) are logged by the Project Owner, evidenced by electronic records, their meter data would be used as record of total electricity produced by the project activity TEG_y for the days for which no record could be recorded. After deduct the power consumed by plant and lineloss, this value would be the EG_y. The power consumed by plant will be measured by one meter which located in the power plant to measure the total power consumed by the plant. The lineloss would be 1.9%.

2. **In case meters (M2 and M3) are all damaged:**

The data of main meter (M1) would be used as the record of power supplied to the grid for the days for which no record could be recorded. After plus the power consumed by plant, the value would be the TEG_y. The power consumed by plant will be measured by one meter which located in the power plant to measure the total power consumed by the plant.

5. Data and records management

[37]Grid connected Agreement.

At the end of each month the monitoring data needs to be filed electronically. The electronic files need to have CD back-up or print-out. The project developer needs to keep electricity sale and purchase invoices.

All written documentation such as maps, drawings, the EIA and the Feasibility study (ECR), should be stored and should be available to the verifier so that the reliability of the information may be checked.

In order to make it easy for the verifier to retrieve the documentation and information in relation to the project emission reduction verification, the project developer should provide a document register. The document management system will be developed to ensure adequate document control for CDM purposes.

The dedicated CDM Manager of the project developer is responsible for checking the data (according to a formal procedure) and the CDM Manager will be responsible for managing the collection, storage and archive of all data and records. A procedure will be developed to manage the CDM record keeping arrangements. All the data shall be kept until two years after the end of crediting period.

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

The baseline and monitoring plan of the proposed project activity was completed by KOE Environmental Consultancy, Inc. (Japan).on 30/03/2009. Name of person/entity determining monitoring plan:

Ms. Fancy Zhao, Consultant, KOE Environmental Consultancy, Inc. (Japan). zxj@cncdm.cn

Add: Room 1906, C Tower , Chengming Building, No.2 , Xicheng Southern Street, Xicheng District, Beijing, 100035, China.

TEL: +86-(0)10-62228639; +86-(0)10-62219066

Add: Room 402, Kourin Bldg, Kanda Ogawamachi 2-8-20, Chiyoda-ku, Tokyo, 101-0052, Japan

Tel: +81-70-6674-3541 Fax: +81-3-3291 8189

KOE Environmental Consultancy, Inc. (Japan) is not one of the project participants.

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:

11/01/2007(The project was purchased by the current owner)

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

30 years

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

7*3 years

C.2.1. Renewable crediting period

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

01/08/2009(or the date after the registration whichever is later)

C.2.1.2. Length of the first crediting period:

7 years

C.2.2. Fixed crediting period:

C.2.2.1. Starting date:

Not applicable.

C.2.2.2. Length:

Not applicable.

SECTION D. Environmental impacts

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

The Environment Impact Assessment (EIA) for this project was designed by Leshan Environment Science Institute in March, 2004, and the approval by Leshan City Environment Protection Bureau was got on 8th, March 2004. At that time, the project is charged by the ex-project owner, so the former environmental measures during the construction period were done by the ex-project owner, and the other environmental measures during the construction period and the whole operation period were done by the current project owner.

According to EIA, the influences of the proposed project on the environment are as follows in the construction and operation period.

In Construction Stage

Water

The wastewater discharge from the construction site has impacts on the water quality according to the EIA.

During the construction period, the wastewater and sewage generated by site construction activities has been treated in the sedimentation tank after collection to meet the strict national standards and then discharged by the owner, so it had less impact on Gaozhuoyinghe River.

Air

The main air pollutant was particulates (dust) which was released from construction activities and transportation and the emission from vehicles and construction machinery.

Many measures had been taken to mitigate this pollutant by the owner, such as sprayed water at construction sites and on dusty roads, transported material in covered vehicles or in closed containers, installed and use a wheel washing system, controlled vehicle speeds and operated with proper maintenance and in compliance with relevant emission standards.

Noise

Vehicles, construction machinery and explosion of dynamite generated the noise.

The mitigation measures which had been done by the project owner included: installed in-situ sound barriers, selected suitable equipment, correct operation and maintenance; limited the speed of vehicles, and the explosion activities had been carried out strictly in the day, there are no significant negative impacts were considered to the local inhabitants because they lived far from the project site.

Solid waste

The main solid waste from this project included: refuse generated on construction site and waste generated by construction workers.

During the construction, these solid wastes had been separated, collected and properly handled in approved landfills and recycling facilities by the project owner.

Ecology

There was no rare tree species and rare wild animals in the project region. The project would cause little impacts on local animal and plant according to the EIA.

Measures for water and soil conservation had been done by the project owner for minimize the adverse impact on the ecological environment during the project construction. Rehabilitation of vegetation had been conducted after the construction work.

Social

Only one inhabitant had been relocated. The inundated area was mainly covered by small trees and bushes. The temporarily and permanently occupied lands were all barren fields.

For the resettlement, a detailed resettlement and compensation plan had been done by the ex-project owner in line with the related laws and regulations of Chinese Government before the construction of the project. The local government had supervised the implementation of the plan to minimize the impact of the resettlement.

In Operation Stage

Water

The wastewater discharge from the living of the staff has impacts on the water quality according to the EIA.

During the annual operation, Sewage water will be treated in the treatment plant to meet the strictest discharging standards prior to be discharged by the project owner.

Air

There was no air pollution caused by hydropower plant during operation stage.

Noise

Noise is generated mainly by machines during operations.

The mitigation measures are taken by the owner will include: selecting low noise machines, locating noisy equipment indoors, installing noise enclosures or buffers, providing green zone with vegetation.

Conclusion

The proposed project carried out environmental monitoring stringently during these periods. Through these measures, the adverse impacts on environment caused by the project had been controlled and mitigated to a minimum.

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:

In China, the construction project activities are requested to submit an EIA report, which needs to be approved by the related government authority. The EIA of the Project had been approved by Leshan City Environmental Protection Bureau of Sichuan Province. Meanwhile, to prevent the loss of soil and water during the project construction and operation particularly, the ex-project owner also prepared an independent Scheme of Water and Soil Conservation (SWSC) for the project, which has already been approved by Water Conservancy Bureau of Leshan City in 1st Mar. 2004. According to both EIA and SWSC, no significant environmental impacts were identified for the project.

Only one resident had been resettled and have been well placed and compensated by the ex-project owner before the construction. Only small area of wild grass ground to be inundated during the operation period of the project. Moreover, stringent environmental monitoring and mitigation measures will be carried out during these periods by the current project owner. Through these measures, the adverse impacts on environment caused by the project will be controlled and mitigated to a minimum.

SECTION E. Stakeholders' comments

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

In 6th Sep.2007, the project owner carried out a survey of local residents, builders and some work staffs of the Project. The survey was conducted through distributing and collecting responses to questionnaires. The survey was mainly included the project introduction, and investigation of their opinions on the Project activity as well as its impacts on the local economy and environment.

The template of questionnaire is as follows:

Questionnaire for public comments on Tiejue 25MW Hydropower Project in Leshan City, Sichuan

Name: **Sex:** **Age:** **Education:**
Profession: **Address:**

Reside time:

- **Attitude to construction of the proposed project:** ①Sustain ②Oppose ③Not to matter
- **What positive impacts do you think construction and operation of the project have on your life?** (Many can be selected)

①Reduce pollutions ⑤Extend electro-range/Increase electro-quantity
②Increase income ⑥Reduce tariff
③Increase employment ⑦Improve road condition
④Improve life standard ⑧Others(Explain generally)

- **What negative impacts do you think construction of the project have on your life?**

①Noise ④Destroy local eco-environment
②Immigration ⑤Pollute air
③Submerge farmland/Building ⑥Others

- **What measurements do you think can reduce negative impacts?** (Explain generally)
- **Do you have other assessments and advices to the project?** (Explain generally if have)

E.2. Summary of the comments received:

50 questionnaires were distributed to the local people, and 48 questionnaires had been returned. The response rate is 96%.

Table E.1 the background of the respondent

Age	①Less than 30	44%	**Sex**	①Male	88%
	②30 to 40	44%			
	③40 to 50	10%		②Female	12%
	④More than 50	2%			
Profession	①Official	0%	**Education**	①Junior college	15%
	②Worker	54%		②High school	29%
	③Farmer	8%		③Middle school	23%
	④Teacher	2%		④Primary school	33%
	⑤Others	36%		⑤Others	0%

The background of the respondents can be seen as follows:

- Age level of the respondents: less than 30(44%), 30-40(44%), 40-50(10%) and more than 50(2%).
- Sex level of the respondents: Male (88%) and female (12%).
- Profession level of the respondents: official (0%), worker (54%), farmer (8%), teacher (2%) and others (36%).
- Education level of the respondents: Junior college (15%), High school (29%), Middle school (23%), Primary school (33%) and others (0%).

Table E.2 Attitude to construction of the proposed project

Attitude	①Sustain	②Oppose	③Not to matter
Number	47	0	1
Percentage	97.9%	0%	2.1%

The attitude to construction of the proposed project by the respondents can be seen as follows:

- 47 peoples (97.9%) sustain;
- 0 (0%) people oppose;
- 1 people (2.1%) considered not to mater.

Table E.3 the positive results of this survey

Positive Impacts	①Reduce pollutions	88%	⑤Increase electro-quantity	100%
	②Increase income	43%	⑥Reduce tariff	86%
	③Increase employment	67%	⑦Improve road condition	66%
	④Improve life standard	96%	⑧Others(Explain generally)	0%

The positive results of this survey are as follows:

- 88% of the respondents believe the proposed project can reduce pollutions;
- 43% of the respondents believe the proposed project can increase income;
- 67% of the respondents believe the proposed project can increase employment;
- 96% of the respondents believe the proposed project can improve life standard;
- 100% of the respondents believe the proposed project can increase electro-quantity;
- 86% of the respondents believe the proposed project can reduce tariff;
- 66% of the respondents believe the proposed project can improve road condition.

Table E.4 the negative results of this survey

Negative Impacts	①Noise	38%	④Destroy local eco-environment	46%
	②Immigration	0%	⑤Pollute air	0%
	③Submerge farmland/ Building	50%	⑥Others	0%

The negative results of this survey are as follows:

- 38% of the respondents believe the proposed project can cause noise;
- 0% of the respondents believe the proposed project can cause immigration;
- 50% of the respondents believe the proposed project can submerge farmland/ building;
- 46% of the respondents believe the proposed project can destroy local eco-environment;
- 0% of the respondents believe the proposed project can pollute air.

In conclusion, the table shows that 97.9% organizations supported the proposed project. At the same time, they gave following opinions and suggestions:

● Attention should be paid to water and soil pollution and adopt measures to protect the ecological system.

●A long-term plan should be made to maintain living, working and education conditions and drive up the employment rate.

● Living conditions could be improved by the proposed project, but measures should be taken to compensate for the occupied land. During construction, all prevention measures should be strictly enforced.

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

For the noise, the mitigation measures which have been done both by the ex-project owner and the current include: installing in-situ sound barriers, selecting suitable equipment, correct operation and maintenance; limiting the speed of vehicles, and the explosion activities will be carried out strictly in the day as described in the section D.

As for some submerged farmland, the ex-project owner had taken compensation measures to solve this problem based on the compensation standard of the government.

And during constructing, both the ex-project owner and the current had taken proper and effective measures to prevent the loss of water and soil, and protected the environment. For instance, barricade and other protective facilities has been built during and after the construction works; the temporary occupied land during the construction has been rehabilitated by soil covering, trees planting and other greening measures. Due to the appropriate measures done by the owner, the local eco-environment was resumed after the construction.

During both the construction and operation period, many job opportunities have been provided to the local residents and the living, working and education conditions were maintained. All stakeholders and local governments were very supportive of the proposed project. Therefore, there is no need to modify its design or construction & operation plans.

Annex 1

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Annex 2

INFORMATION REGARDING PUBLIC FUNDING

No public funding is involved in this project activity.

Annex 3

BASELINE INFORMATION

The baseline information for calculation of OM, BM and CM emission factor of Central China Power Grid is shown in the Report on Determination of Baseline Grid Emission Factor by China DNA NDRC at http://cdm.ccchina.gov.cn. The concrete process is shown in the following tables.

As calculated in the table A1, among the total electricity generations of the CCPG, the amount of low-cost/must run resources accounts for about 35.95% in 2002, 34.42% in 2003, 38.54% in 2004, 38.18% in 2005, and 40.64% in 2006; the average is 37.55%. Any value in recent 5 years is less than 50%. Thus, the method (a) Simple OM can be used to calculate the baseline emission factor of operating margin ($EF_{OM,y}$) for the Project.

Table A1 Calculation of the Percentage of "Power generation from "Low operating cost and must run resources" in the "Total Power Generation" in CCPG

CCPG 2002							
	Hydro	**Fuel**	**Nuclear**	**Others**	**Total Power generation**	**Power generation from "Low operating cost and must run resources"**	**Percentage of "Power generation from "Low operating cost and must run resources" in the "Total Power Generation"**
	Unit：10^8kWh						
	A	B	C	D	E=A+B+C+D	F=A+C+D	G＝F/E
Henan	48.59	847.34					**35.95%**
Hubei	278.54	343.01					
Hunan	253.29	200.58					
Jiangxi	61.51	186.48					
Chongqing	37.48	147.27					
Sichuan	444.99	278.79					
Total	1124.4	2003.47	0	0	3127.87	1124.4	

CCPG 2003							
	Hydro	**Fuel**	**Nuclear**	**Others**	**Total Power generation**	**Power generation from "Low operating cost and must run resources"**	**Percentage of "Power generation from "Low operating cost and must run resources" in the "Total Power Generation"**
	Unit：10^8kWh						
	A	B	C	D	E=A+B+C+D	F=A+C+D	G＝F/E
Henan	54.57	955.18					**34.42%**
Hubei	387.75	395.32					
Hunan	244.01	295.01					
Jiangxi	38.64	271.65					
Chongqing	39.51	163.41					
Sichuan	500	327.82					
Total	1264.48	2408.39	0	0	3672.87	1264.48	

CCPG 2004							
	Hydro	**Fuel**	**Nuclear**	**Others**	**Total Power generation**	**Power generation from "Low operating cost and must run resources"**	**Percentage of "Power generation from "Low operating cost and must run resources" in the "Total Power Generation"**
	Unit：10^8kWh						
	A	B	C	D	E=A+B+C+D	F=A+C+D	G＝F/E
Henan	68.84	1093.52					**38.54%**
Hubei	695.12	430.34					
Hunan	242.36	371.86					
Jiangxi	38.9	301.27					
Chongqing	56.7	165.2		7.25			
Sichuan	589.02	346.27					
Total	1690.94	2708.46	0	7.25	4406.65	1698.19	

CCPG 2005

	Hydro	Fuel	Nuclear	Others	Total Power generation	Power generation from "Low operating cost and must run resources"	Percentage of "Power generation from "Low operating cost and must run resources" in the "Total Power Generation"
	Unit: 10^8kWh						
	A	B	C	D	E=A+B+C+D	F=A+C+D	G=F/E
Henan	67	1315.9		0.1			**38.18%**
Hubei	814	477					
Hunan	241	399					
Jiangxi	50	300					
Chongqing	60.36	175.84					
Sichuan	644.98	372.02					
Total	1877.34	3039.76	0	0.1	4917.2	1877.44	

CCPG 2006							
	Hydro	**Fuel**	**Nuclear**	**Others**	**Total Power generation**	**Power generation from "Low operating cost and must run resources"**	**Percentage of "Power generation from "Low operating cost and must run resources" in the "Total Power Generation"**
	Unit: 10^8kWh						
	A	B	C	D	E=A+B+C+D	F=A+C+D	G=F/E
Henan	255.28	3260.33					**40.64%**
Hubei	1832.05	1162.33					
Hunan	864.75	1071.50					
Jiangxi	328.82	656.75					
Chongqing	197.89	559.41		2.40			
Sichuan	1765.27	952.46					
Total	5244.06	7662.78		2.40	12909.24	5246.46	
Average	**37.55%**						

TableA1 Calculation of simple OM emission factor of the Central China Power Grid in 2003

Fuels	Units	Jiangxi	Henan	Hubei	Hunan	Chong qing	Sichuan	Total	Emission factor (tC/TJ)	OXID (%)	NCV (MJ/t, or MJ/km^3)	Emission (tCO_2e)
		A	B	C	D	E	F	G=A+B+C +D+E+F	H	I	J	K=G**H*I*J*44/12/ 10000 (quality unit) / K=G**H*I*J*44/12/ 1000 (volume unit)
Raw coal	10^4 ton	1427.41	5504.94	2072.44	1646.47	769.47	2430.93	**13851.66**	25.8	100	20908	273971539.89
Washed coal	10^4 ton							**0**	25.8	100	26344	0.00
Other washed coal	10^4 ton	2.03	39.63			106.12		**147.78**	25.8	100	8363	1169146.40
Coke	10^4 ton				1.22			**1.22**	25.8	100	28435	32817.40
Coke oven gas	10^8 M^3			0.93				**0.93**	12.1	100	16726	69013.15
Other gas	10^8 M^3							**0**	12.1	100	5227	0.00
Crude oil	10^4 ton		0.5	0.24			1.2	**1.94**	20	100	41816	59490.23
Gasoline	10^4 ton							**0**	18.9	100	43070	0.00
Diesel	10^4 ton	0.52	2.54	0.69	1.21	0.77		**5.73**	20.2	100	42652	181015.94
Fuel oil	10^4 ton	0.42	0.25	2.17	0.54	0.28	1.2	**4.86**	21.1	100	41816	157229.00
LPG	10^4 ton							**0**	17.2	100	50179	0.00
Refinery gas	10^4 ton	1.76	6.53		0.66			**8.95**	18.2	100	46055	275069.63
Natural gas	10^8 M^3					0.04	2.2	**2.24**	15.3	100	38931	489222.52
Other petroleum products	10^4 ton							**0**	20	100	38369	0.00
Other coking products	10^4 ton							**0**	25.8	100	28435	0.00
Other energy	10^4 ton		11.04			16.2		**27.24**	0	100	0	0.00
Total												**276404544.15**

Data source: *China Energy Statistical Yearbook 2004*

Table A2 The fuel fired electricity generation of Central China Power Grid in 2003

Province	The fuel fired electricity generation(MWh)	The rate of electricity self-consumption(%)	The fuel fired electricity connected to the grid(MWh)
Jiangxi	27,165,000	6.43	25,418,291
Henan	95,518,000	7.68	88,182,218
Hubei	39,532,000	3.81	38,025,831
Hunan	29,501,000	4.58	28,149,854
Chongqing	16,341,000	8.97	14,875,212
Sichuan	32,782,000	4.41	31,336,314
The Totlal			**225,987,719**
Total Emission (tCO_2)			**276404544.15**
$EF_{OM,y}$ for 2003			**1.223095**

Data source: *China Electric Power Yearbook 2004*

Table A3 Calculation of simple OM emission factor of the Central China Power Grid in 2004

Fuels	Units	Jiang xi	Henan	Hubei	Hunan	Chong qing	Si chuan	Total	Emission factor (tC/TJ)	OXID (%)	NCV(MJ /t, or MJ/km^3)	Emission (tCO_2e)
		A	B	C	D	E	F	G=A+B +C+ D+E+F	H	I	J	K=G**H*I*J*44/12/ 10000（quality unit） K=G**H*I*J*44/12/ 1000（volume unit）
Raw coal	10^4 ton	1863.8	6948.5	2510.5	2197.9	875.5	2747.9	**17144.1**	25.8	100	20908	339,092,605
Washed coal	10^4 ton		2.34					**2.34**	25.8	100	26344	58,316
Other washed coal	10^4 ton	48.93	104.22			89.72		**242.87**	25.8	100	8363	1,921,441
Coke	10^4 ton		109.61					**109.61**	25.8	100	28435	2,948,455
Coke oven gas	10^8 M^3			1.68		0.34		**2.02**	12.1	100	16726	149,900
Other gas	10^8 M^3					2.61		**2.61**	12.1	100	5227	60,527
Crude oil	10^4 ton		0.86	0.22				**1.08**	20	100	41816	33,118
Gasoline	10^4 ton		0.06			0.01		**0.07**	18.9	100	43070	2,089
Diesel	10^4 ton	0.02	3.86	1.7	1.72	1.14		**8.44**	20.2	100	42652	266,627
Fuel oil	10^4 ton	1.09	0.19	9.55	1.38	0.48	1.68	**14.37**	21.1	100	41816	464,893
LPG	10^4 ton							**0**	17.2	100	50179	0
Refinery gas	10^4 ton	3.52	2.27					**5.79**	18.2	100	46055	177,950
Natural gas	10^8 M^3						2.27	**2.27**	15.3	100	38931	495,775
Other petroleum products	10^4 ton							**0**	20	100	38369	0
Other coking products	10^4 ton							**0**	25.8	100	28435	0
Other energy	10^4 ton		16.92		15.2	20.95		**53.07**	0	100	0	0
Total												**345,671,697.30**

Data source: *China Energy Statistical Yearbook 2005*

Table A4 The fuel fired electricity generation of Central China Power Grid in 2004

Province	The fuel fired electricity generation（MWh）	The rate of electricity self-consumption（%）	The fuel fired electricity connected to the grid（MWh）
Jiangxi	30,127,000	7.04	28,006,059
Henan	109,352,000	8.19	100,396,071
Hubei	43,034,000	6.58	40,202,363
Hunan	37,186,000	7.47	34,408,206
Chongqing	16,520,000	11.06	14,692,888
Sichuan	34,627,000	9.41	31,368,599
The Totlal			**249,074,186**
Total Emission (tCO_2)			**345671697.30**
$EF_{OM,y}$ for 2004			**1.387826**

Data source: *China Electric Power Yearbook 2005*

Table A5 Calculation of simple OM emission factor of the Central China Power Grid in 2005

Fuels	Units	Jiang xi	Henan	Hubei	Hunan	Chong qing	Si chuan	Total	Emission factor (tC/TJ)	OXID (%)	NCV(MJ/t, or MJ/km^3)	Emission (tCO_2e)
		A	B	C	D	E	F	G=A+B+C+D+E+F	H	I	J	K=G**H*I*J*44/12/10000 (quality unit) K=G**H*I*J*44/12/1000 (volume unit)
Raw coal	10^4 ton	1869.29	7638.87	2732.15	1712.27	875.4	2999.77	**17827.75**	25.8	100	20908	352,614,497
Washed coal	10^4 ton	0.02						**0.02**	25.8	100	26344	498
Other washed coal	10^4 ton		138.12			89.99		**228.11**	25.8	100	8363	1,804,669
Coke	10^4 ton		25.95		105			**130.95**	25.8	100	28435	3,986,695
Coke oven gas	10^8 M^3			1.15		0.36		**1.51**	12.1	100	16726	112,054
Other gas	10^8 M^3		10.2			3.12		**13.32**	12.1	100	5227	308,897
Crude oil	10^4 ton		0.82	0.36				**1.18**	20	100	41816	36,185
Gasoline	10^4 ton		0.02			0.02		**0.04**	18.9	100	43070	1,194
Diesel	10^4 ton	1.3	3.03	2.39	1.39	1.38		**9.49**	20.2	100	42652	299,798
Fuel oil	10^4 ton	0.64	0.29	3.15	1.68	0.89	2.22	**8.87**	21.1	100	41816	286,959
LPG	10^4 ton							**0**	17.2	100	50179	0
Refinery gas	10^4 ton	0.71	3.41	1.76	0.78			**6.66**	18.2	100	46055	176,572
Natural gas	10^8 M^3						3	**3**	15.3	100	38931	655,209
Other petroleum products	10^4 ton							**0**	20	100	38369	0
Other coking products	10^4 ton				1.5			**1.5**	25.8	100	28435	40,349
Other energy	10^4 ton		2.88		1.74	32.8		**37.42**	0	100	0	0
Total												**359887487.74**

Data source: *China Energy Statistical Yearbook 2006*

Table A6 The fuel fired electricity generation of Central China Power Grid in 2005

Province	The fuel fired electricity generation（MWh）	The rate of electricity self-consumption（%）	The fuel fired electricity connected to the grid（MWh）
Jiangxi	30,000,000	6.48	28,056,000
Henan	131,590,000	7.32	121,957,612
Hubei	47,700,000	2.51	46,502,730
Hunan	39,900,000	5	37,905,000
Chongqing	17,584,000	8.05	16,168,488
Sichuan	37,202,000	4.27	35,613,475
The Totlal			**286,203,305**
Total Emission (tCO_2)			**359887487.74**
$EF_{OM,y}$ for 2005			**1.257454**

Data source: *China Electric Power Yearbook 2006*

TableA7 The three years generation weighted average emission factor of Central China Power Grid

Years	2003	2004	2005	three years average emission factor (tCO_2e/MWh)
Total CO_2 emission (tCO_2e)	**276,404,544**	**345,671,697**	**359,887,488**	**1.2899102**
The total fuel fired electricity connected to the grid (MWh)	**225,987,719**	**249,074,186**	**286,203,305**	

Table A8 Calculation the weight of CO_2 emissions from solid fuels, liquid fuels and gas fuels among the total emissions in Central China Power Grid

		Jiangxi	Henan	Hubei	Hunan	Chongqing	Sichuan	Total	NCV (kJ/kg or m^3)	Emission factor	OXID	CO_2 emissions (tCO_2e) K=G*H*I*J*44/12/100
Fuels	Units	A	B	C	D	E	F	G=A+B+C+D+E+F	H	I	J	K
Raw coal	10^4t	1869.29	7638.87	2732.15	1712.27	875.4	2999.77	**17827.75**	20908	25.8	1	352,614,497
Washed coal	10^4t	0.02	0	0	0	0	0	**0.02**	26344	25.8	1	498
Other washed coal	10^4t	0	138.12	0	0	89.99	0	**228.11**	8363	25.8	1	1,804,669
Coke	10^4t	0	25.95	0	106.5	0	0	**132.45**	28435	25.8	1	3,562,840
Total of solid fuels												**357,982,504**
Crude oil	10^4t	0	0.82	0.36	0	0	0	**1.18**	41816	20	1	36,185
Gasoline	10^4t	0	0.02	0	0	0.02	0	**0.04**	43070	18.9	1	1,194
Coal oil	0	0	0	0	0	0	0	**0**	43070	19.6	1	0
Diesel	10^4t	1.3	3.03	2.39	1.39	1.38	0	**9.49**	42652	20.2	1	299,798
Fuel oil	10^4t	0.64	0.29	3.15	1.68	0.89	2.22	**8.87**	41816	21.1	1	286,959
Other petroleum products	10^4t	0	0	0	0	0	0	**0**	38369	20	1	0
Total of liquid fuels												**624,136**
Natural gas	10^8m^3	0	0	0	0	0	30	**30**	38931	15.3	1	655,209
Coke oven gas	10^8m^3	0	0	11.5	0	3.6	0	**15.1**	16726	12.1	1	112,054
Other gas	10^8m^3	0	102	0	0	31.2	0	**133.2**	5227	12.1	1	308,897
LPG	10^4t	0	0	0	0	0	0	**0**	50179	17.2	1	0
Refinery gas	10^4t	0.71	3.41	1.76	0.78	0	0	**6.66**	46055	18.2	1	204,689
Total of gas fuels												**1,280,848**
Total of all other fuels												**359,887,488**

Data source: *China Energy Statistical Yearbook 2006*

Table A9 The emission factor of the most efficient commercial coal-fueled, oil-fueled and gas-fueled power plant

	Variable	Efficiency of electricity supply	Emission factor of the fuels(tC/TJ)	OXID	Emission factor (tCO_2e/MWh)
		A	B	C	D=3.6/A/1000*B*C*44/12
Coal-fueled power plant	$EF_{Coal,Adv}$	38.43%	25.8	1	0.8862
Gas-fueled power plant	$EF_{Gas,Adv}$	47.67%	15.3	1	0.4237
Oil-fueled power plant	$EF_{Oil,Adv}$	47.67%	21.1	1	0.5843

TableA10 the weight of CO_2 emission from solid, liquid and gas fuels among the total emissions and the thermal emission factor of CCPG

$\lambda_{Coal,y}$	$\lambda_{Oil,y}$	$\lambda_{Gas,y}$	$EF_{EL,fossil,Adv,y}$（tCO_2e/MWh） $(\lambda_{Coal,y} * EF_{Coal,Adv} + \lambda_{Oil,y} * EF_{Oil,Adv} + \lambda_{Gas,y} * EF_{Gas,Adv})$
99.47%	0.17%	0.36%	*0.8840*

Table A11 Calculation of BM emission factor of Central China Power Grid

	2003 installed capacity	*2004 installed capacity*	*2005 installed capacity*	*Newly added installed capacity between 2003 and 2005*	*Weight in newly added installed capacity*
	A	*B*	*C*	*D=C-A*	
Fossil fueled（MW）	*43303.2*	*46893.5*	*60167.2*	*16864*	*69.52%*
Hydro power（MW）	*31034.7*	*32357*	*38405.2*	*7370.5*	*30.38%*
Nuclear power（MW）	*0*	*0*	*0*	*0*	*0.00%*
Wind power（MW）	*0*	*0*	*24*	*24*	*0.10%*
Total（MW）	*74337.9*	*79250.5*	*98596.4*	*24258.5*	*100.00%*
Share in 2006 installed capacity	*75.40%*	*80.38%*	*100%*		

$EF_{BM,y}$=0.8840*69.52%=0.6146 tCO_2e/MWh.

Data source: *China Electric Power Yearbook 2004*-2006

Table A12 Calculation of CM emission factor of Central China Power Grid and emission reductions of the proposed project

OM (tCO_2e/MWh)	BM (tCO_2e/MWh)	CM (tCO_2e/MWh)	The grid-connected electricity generated (MWh)	Annual emission reductions (tCO_2e)
A	B	C=0.5×A+0.5×B	D	E=C×D
1.2899	0.6146	0.9523	103,830	98,877

Annex 4

MONITORING INFORMATION

No other information.

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Basic Parameters					
Series	**General description**	**Value**		**Unit**	**Data source**
1	Installed capacity	25		MW	PDR
2	Net grid-connected electricity generation	103,830		MWh	PDR
3	CM of CCPG(tCO_2e/MWh)	0.9746		tCO_2e/MWh	
4	Construction period	2		year	PDR
5	Operation period	30		year	PDR
6	Grid-in tariff(yuan/kWh, excluding VAT)	0.192RMB/kWh	$ 0.024/kWh		PDR
7	Assumed Currency Conversion Factor(Dollatr:RMB)	8:1			
	Investment plan				
1	Value of fixed assets	122.43million yuan	$ 15,303,600		
2	Interest of long-term loan	7.11%			PDR
3	Payment period of long-term loan	14.4		year	PDR
	Tax				
1	VAT	17%			PDR
2	Income tax	33%			PDR
3	Urban maintenance and construction tax	5%			PDR
4	Surtax for education	3%			PDR
	O&M Cost				
	Total O&M cost	**3,989,353**	**$ 498,670**		
1	Raw Material	125,000	$ 15,625		PDR page213
2	Reservior maintenance	108,157	$ 13,525		PDR page213
3	Labor	616,000	$ 77,000		PDR page213
4	Repairs	1,836,450	$ 229,554		PDR page213
5	Selling Expenses	271,121	$ 33,890		PDR page213
6	Water Source	432,626	$ 54,080		PDR page213
7	Other	600,000	$ 75,000		PDR page213
	CERs				
1	Annual CERs	101,188			
2	CERs unit price	96yuan/t	$ 12/t		
3	CERs income	9,714,003	1,214,250		

ONLY THE GREEN CELLS SHALL BE FILLED

PLEASE USE THE AREA AT THE END OF THIS SHEET FOR ADDITIONAL EXPLANATIONS OR DETAILS, IF NECESSARY

Name of Project	Sichuan Tieju 25MW Hydro Power Project
Country	China

GEN. ASSUMPTIONS

Factor			
	Com. Prod.	1	TO BE FILLED ONLY WITH 0 (TO EXCLUDE THE COMPONENT) OR WITH 1 (TO INCLUDE THE COMPONENT)
	ERs	0	
	Loan	1	
Expected annual distribution of dividends	0%		
Expected return on equity	10%		

INVESTMENTS

		Project start-up	1	2	3
1	Initial Investments (including taxes if any):	$15,303,600			
	Construction Engineering	$6,098,325	$3,049,163	$3,049,163	$0
	Machinery / Equipments	$3,768,800	$1,884,400	$1,884,400	$0
	Furniture & Fittings	$1,223,075	$611,538	$611,538	$0
	Temporary Engineering	$1,201,300	$600,650	$600,650	$0
	Other	$3,012,100	$1,399,531	$1,612,569	$0
	Depretiation Rate	3.06%		100%	
2	Financing:				
	Loan(s) Amount	$	$5,171,913	$5,317,940	$0
	Tenor	14.4 years			
	Grace Period	0 years			
	Interest rate	7.11%			
3	Equity:	$			
	Source 1	$	$2,373,368	$2,440,379	$0
	Source 2	$	$0	$0	$0
	Others	$	$0	$0	$0
	Sources & Uses Control	OK			

O & M COSTS

		Project start-up	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
1	Operating costs (including taxes if any):	$																																
	Raw Material	$	$0	$0	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625
	Reservior maintenance	$	$0	$0	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525
	Labor	$	$0	$0	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000
	Repairs	$	$0	$0	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554
	Selling Expenses	$	$0	$0	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890
	Water Source	$	$0	$0	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080
	Other	$	$0	$0	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000
2	Insurance:	0.25% of investments																																
3	Certifications:	$	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	VAT	17.00%																																
	urban maintenance and construction tax	5.00%																																
	surtax for education	3.00%																																
4	Income Tax:	33.00%																																
5	Carbon costs:	$																																
	Baseline Study, Monitoring Plan	$0																																
	Validation	$0																																
	Due diligence by WB / CF Unit	$0																																
	Annual Verification	$0																																

REVENUES

		Start-up	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
1	Net Revenues				100%																													
	Net Revenues - 1st Product																																	
	Production	(Unit)	0	0	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000
	Net Sales Price	$	$0.00	$0.00	$0.02	$0.02	$0.02	$0.02	$0.02	$0.02	$0.02	$0.02	$0.02	$0.02	$0.02	$0.02	$0.02	$0.02	$0.02	$0.02	$0.02	$0.02	$0.02	$0.02	$0.02	$0.02	$0.02	$0.02	$0.02	$0.02	$0.02	$0.02	$0.02	$0.02
	Net Revenues - 2nd Product																																	
	Production	(Unit)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Net Sales Price	$	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
	Net Revenues - Other Product																																	
	Production	(Unit)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Net Sales Price	$	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
	Net Revenues - Carbon Credits																																	
	Carbon generation	(tCO2e)	0	0	101,188	101,188	101,188	101,188	101,188	101,188	101,188	101,188	101,188	101,188	101,188	101,188	101,188	101,188	101,188	101,188	101,188	101,188	101,188	101,188	101,188	101,188	0	0						
	Carbon price	$12.00 /tCO2e	TO BE NEGOTIATED																															
2	Extraordinary Net Revenues	$	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

PLEASE USE THE AREA BELOW FOR ADDITIONAL INFO, IF NECESSARY

NO INPUT REQUIRED IN THIS SPREADSHEET

Name of Project	**Sichuan Tiejue 25MW Hydro Power Project**
Country	**China**

INVESTMENTS AND EXPENSES

		Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
1	**Investments:**	$	$7,545,281	$7,758,319	$0																													
	Construction Engineering	$	$3,049,163	$3,049,163	$0																													
	Machinery / Equipments	$	$1,884,400	$1,884,400	$0																													
	Furniture & Fittings	$	$611,538	$611,538	$0																													
	Temporary Engineering	$	$600,650	$600,650	$0																													
	Other	$	$1,399,531	$1,612,569	$0																													
2	**Depreciation:**	3% per year	$0	$0	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290
	Jan-00	3% per year	$0	$0	$230,886	$230,886	$230,886	$230,886	$230,886	$230,886	$230,886	$230,886	$230,886	$230,886	$230,886	$230,886	$230,886	$230,886	$230,886	$230,886	$230,886	$230,886	$230,886	$230,886	$230,886	$230,886	$230,886	$230,886	$230,886	$230,886	$230,886	$230,886	$230,886	$230,886
	Jan-00	3% per year		$0	$237,405	$237,405	$237,405	$237,405	$237,405	$237,405	$237,405	$237,405	$237,405	$237,405	$237,405	$237,405	$237,405	$237,405	$237,405	$237,405	$237,405	$237,405	$237,405	$237,405	$237,405	$237,405	$237,405	$237,405	$237,405	$237,405	$237,405	$237,405	$237,405
	Jan-00	3% per year			$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	Jan-00	3% per year				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	Jan-00	3% per year					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
3	**Operating costs:**	$	$0	$0	$498,674	$498,674	$498,674	$498,674	$498,674	$498,674	$498,674	$498,674	$498,674	$498,674	$498,674	$498,674	$498,674	$498,674	$498,674	$498,674	$498,674	$498,674	$498,674	$498,674	$498,674	$498,674	$498,674	$498,674	$498,674	$498,674	$498,674	$498,674	$498,674	$498,674
	Raw Material	$	$0	$0	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625
	Reservior maintenance	$	$0	$0	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525
	Labor	$	$0	$0	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000
	Repairs	$	$0	$0	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554
	Selling Expenses	$	$0	$0	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890
	Water Source	$	$0	$0	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080
	Other	$	$0	$0	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000
4	**Insurance:**	0% of investments	$0	$0	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259
5	**Certifications:**	$	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
6	**Financing:**	CPLTD	$0	$359,161	$728,462	$728,462	$728,462	$728,462	$728,462	$728,462	$728,462	$728,462	$728,462	$728,462	$728,462	$728,462	$728,462	$728,462	$728,462	$728,462	$369,301	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
		Interest	$0	$367,723	$720,292	$668,499	$616,705	$564,911	$513,118	$461,324	$409,530	$357,737	$305,943	$254,149	$202,356	$150,562	$98,768	$46,975	-$4,819	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076
	Amount	$	$5,171,913	$5,317,940	$0	$0	$0																											
	Tenor	14 years																																
	Grace Period	0 years																																
	Interest rate	7.11%																																
	Jan-00	CPLTD		$359,161	$359,161	$359,161	$359,161	$359,161	$359,161	$359,161	$359,161	$359,161	$359,161	$359,161	$359,161	$359,161	$359,161	$359,161	$359,161	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
		Interest		$367,723	$342,187	$316,650	$291,114	$265,578	$240,041	$214,505	$188,969	$163,432	$137,896	$112,360	$86,823	$61,287	$35,751	$10,215	-$15,322	-$15,322	-$15,322	-$15,322	-$15,322	-$15,322	-$15,322	-$15,322	-$15,322	-$15,322	-$15,322	-$15,322	-$15,322	-$15,322	-$15,322	-$15,322
	Jan-00	CPLTD			$369,301	$369,301	$369,301	$369,301	$369,301	$369,301	$369,301	$369,301	$369,301	$369,301	$369,301	$369,301	$369,301	$369,301	$369,301	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
		Interest			$378,106	$351,848	$325,591	$299,334	$273,076	$246,819	$220,562	$194,304	$168,047	$141,790	$115,532	$89,275	$63,018	$36,760	$10,503	-$15,754	-$15,754	-$15,754	-$15,754	-$15,754	-$15,754	-$15,754	-$15,754	-$15,754	-$15,754	-$15,754	-$15,754	-$15,754	-$15,754	-$15,754	-$15,754
	Jan-00	CPLTD				$0	$0	$0	$0	$0	$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				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	Jan-00	CPLTD					$0	$0	$0	$0	$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					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	Jan-00	CPLTD						$0	$0	$0	$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						$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
7	**Income Tax:**	33.00%																																
8	**Carbon costs:**	$	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	Baseline Study, Monitoring Plan	$0.00	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	Validation	$0.00	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	Due diligence by BioCarbon Fund	$0.00	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	Annual Verification	$0.00	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

REVENUES

		Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
1	**Net Revenues**		$0	$0	$3,706,170	$3,706,170	$3,706,170	$3,706,170	$3,706,170	$3,706,170	$3,706,170	$3,706,170	$3,706,170	$3,706,170	$3,706,170	$3,706,170	$3,706,170	$3,706,170	$3,706,170	$3,706,170	$3,706,170	$3,706,170	$3,706,170	$3,706,170	$3,706,170	$3,706,170	$2,491,920	$2,491,920	$2,491,920	$2,491,920	$2,491,920	$2,491,920	$2,491,920	$2,491,920	$2,491,920	$2,491,920
	Net Revenues - 1st Product	$	$0	$0	$2,491,920	$2,491,920	$2,491,920	$2,491,920	$2,491,920	$2,491,920	$2,491,920	$2,491,920	$2,491,920	$2,491,920	$2,491,920	$2,491,920	$2,491,920	$2,491,920	$2,491,920	$2,491,920	$2,491,920	$2,491,920	$2,491,920	$2,491,920	$2,491,920	$2,491,920	$2,491,920	$2,491,920	$2,491,920	$2,491,920	$2,491,920	$2,491,920	$2,491,920	$2,491,920	$2,491,920
	production	(Unit)	0	0	103,830,000	103,830,000	103,830,000	103,830,000	103,830,000	103,830,000	103,830,000	103,830,000	103,830,000	103,830,000	103,830,000	103,830,000	103,830,000	103,830,000	103,830,000	103,830,000	103,830,000	103,830,000	103,830,000	103,830,000	103,830,000	103,830,000	103,830,000	103,830,000	103,830,000	103,830,000	103,830,000	103,830,000	103,830,000	103,830,000	103,830,000
	Sales price	$	$0	$0	$0.024	$0.024	$0.024	$0.024	$0.024	$0.024	$0.024	$0.024	$0.024	$0.024	$0.024	$0.024	$0.024	$0.024	$0.024	$0.024	$0.024	$0.024	$0.024	$0.024	$0.024	$0.024	$0.024	$0.024	$0.024	$0.024	$0.024	$0.024	$0.024	$0.024	$0.024
	Net Revenues - 2nd Product	$	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	production	(Unit)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Sales price	$	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	Net Revenues - Other Product	$	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	Production	(Unit)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Price	$	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	Net Revenues - Carbon Credits	$	$0	$0	$1,214,250	$1,214,250	$1,214,250	$1,214,250	$1,214,250	$1,214,250	$1,214,250	$1,214,250	$1,214,250	$1,214,250	$1,214,250	$1,214,250	$1,214,250	$1,214,250	$1,214,250	$1,214,250	$1,214,250	$1,214,250	$1,214,250	$1,214,250	$1,214,250	$1,214,250	$1,214,250	$0	$0	$0	$0	$0	$0	$0	$0	$0
	Carbon generation	(tCO2e)	0	0	101,188	101,188	101,188	101,188	101,188	101,188	101,188	101,188	101,188	101,188	101,188	101,188	101,188	101,188	101,188	101,188	101,188	101,188	101,188	101,188	101,188	101,188	0	0	0	0	0	0			
	Carbon price	$12.00 /tCO2e																																
2	**Extraordinary Net Revenues**	$	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

NO INPUT REQUIRED IN THIS SPREADSHEET

Name of Project	Sichuan Tiejue 25MW Hydro Power Project
Country	China

Project Cashflow

	Unit	Jan-00	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?
Net Revenues - 1st Product		**$0**	**$0**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**
production	(Unit)	0	0	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000
Sales price	$	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Revenues - 2nd Product		**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
production	(Unit)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sales price	$	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Revenues - Other Product		**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Production	(Unit)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Price	$	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Revenues - Carbon Credits		**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
ERs Production	**(tCO2e)**	0	0	101187.5265	101187.5265	101187.5265	101187.5265	101187.5265	101187.5265	101187.5265	101187.5265	101187.5265	101187.5265	101187.5265	101187.5265	101187.5265	101187.5265	101187.5265	101187.5265	101187.5265	101187.5265	101187.5265	101187.5265	101187.5265	101187.5265	101187.5265	101187.5265	101187.5265	0	0	0	0	0	0	
ER Price	**12.0 US$/ton**																																	
Total Net Revenues		**$0**	**$0**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**
(-) Total Costs		**$0**	**$0**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**
(-) Operating Costs																																		
Raw Material		$0	$0	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625
Reservior maintenance		$0	$0	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525
Labor		$0	$0	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000
Repairs		$0	$0	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554
Selling Expenses		$0	$0	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890
Water Source		$0	$0	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080
Other		$0	$0	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000
(-) Insurance:		$0	$0	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259
(-) Certifications:		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
(-) Costs BS/MP ERs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
(-) Costs Valid. ERs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
(-) Due Dilig PCF ERs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
(-) Annual Verif. ERs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Margin / (EBITDA)		**$0**	**$0**	**$1,954,987**	**$1,954,987**	**$1,954,987**	**$1,954,987**	**$1,954,987**	**$1,954,987**	**$1,954,987**	**$1,954,987**	**$1,954,987**	**$1,954,987**	**$1,954,987**	**$1,954,987**	**$1,954,987**	**$1,954,987**	**$1,954,987**	**$1,954,987**	**$1,954,987**	**$1,954,987**	**$1,954,987**	**$1,954,987**	**$1,954,987**	**$1,954,987**	**$1,954,987**	**$1,954,987**	**$1,954,987**	**$1,954,987**	**$1,954,987**	**$1,954,987**	**$1,954,987**	**$1,954,987**	**$1,954,987**
(-) D/D/A machinery	3%	$0	$0	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290
(-) Interest expenses		$0	$367,723	$720,292	$668,499	$616,705	$564,911	$513,118	$461,324	$409,530	$357,737	$305,943	$254,149	$202,356	$150,562	$98,768	$46,975	-$4,819	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076
Operational Result (EBT)		**$0**	**-$367,723**	**$766,405**	**$818,198**	**$869,992**	**$921,785**	**$973,579**	**$1,025,373**	**$1,077,166**	**$1,128,960**	**$1,180,754**	**$1,232,547**	**$1,284,341**	**$1,336,135**	**$1,387,928**	**$1,439,722**	**$1,491,516**	**$1,517,773**	**$1,517,773**	**$1,517,773**	**$1,517,773**	**$1,517,773**	**$1,517,773**	**$1,517,773**	**$1,517,773**	**$1,517,773**	**$1,517,773**	**$1,517,773**	**$1,517,773**	**$1,517,773**	**$1,517,773**	**$1,517,773**	**$1,517,773**	**$1,517,773**
(+) Extraord. Income		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Profit before tax		**$0**	**-$367,723**	**$766,405**	**$818,198**	**$869,992**	**$921,785**	**$973,579**	**$1,025,373**	**$1,077,166**	**$1,128,960**	**$1,180,754**	**$1,232,547**	**$1,284,341**	**$1,336,135**	**$1,387,928**	**$1,439,722**	**$1,491,516**	**$1,517,773**	**$1,517,773**	**$1,517,773**	**$1,517,773**	**$1,517,773**	**$1,517,773**	**$1,517,773**	**$1,517,773**	**$1,517,773**	**$1,517,773**	**$1,517,773**	**$1,517,773**	**$1,517,773**	**$1,517,773**	**$1,517,773**	**$1,517,773**	**$1,517,773**
(-) Income tax	33.00%	$0	$0	$0	$0	$143,549	$152,095	$160,641	$338,373	$355,465	$372,557	$389,649	$406,741	$423,833	$440,924	$458,016	$475,108	$492,200	$500,865	$500,865	$500,865	$500,865	$500,865	$500,865	$500,865	$500,865	$500,865	$500,865	$500,865	$500,865	$500,865	$500,865	$500,865	$500,865	$500,865
Net profit		**$0**	**-$367,723**	**$766,405**	**$818,198**	**$726,443**	**$769,691**	**$812,939**	**$687,000**	**$721,701**	**$756,403**	**$791,105**	**$825,807**	**$860,508**	**$895,210**	**$929,912**	**$964,614**	**$999,315**	**$1,016,908**	**$1,016,908**	**$1,016,908**	**$1,016,908**	**$1,016,908**	**$1,016,908**	**$1,016,908**	**$1,016,908**	**$1,016,908**	**$1,016,908**	**$1,016,908**	**$1,016,908**	**$1,016,908**	**$1,016,908**	**$1,016,908**	**$1,016,908**	**$1,016,908**
(-) Dividends		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
(+) D/D/A		$0	$0	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290
(-) Investments		$7,545,281	$7,758,319	$0	$0	$0																												
Construction Engineering		$3,049,163	$3,049,163	$0	$0	$0																												
Machinery / Equipments		$1,884,400	$1,884,400	$0	$0	$0																												
Fumiture & Fittings		$611,538	$611,538	$0	$0	$0																												
Temporary Engineering		$600,650	$600,650	$0	$0	$0																												
Other		$1,399,531	$1,612,569	$0	$0	$0																												
(+) Loan		$5,171,913	$5,317,940	$0	$0	$0																												
(-) CPLTD		$0	$359,161	$728,462	$728,462	$728,462	$728,462	$728,462	$728,462	$728,462	$728,462	$728,462	$728,462	$728,462	$728,462	$728,462	$728,462	$728,462	$369,301	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Free Cash Flow		**-$2,373,368**	**-$3,167,263**	**$506,233**	**$558,026**	**$466,271**	**$509,519**	**$552,767**	**$426,828**	**$461,530**	**$496,231**	**$530,933**	**$565,635**	**$600,337**	**$635,038**	**$669,740**	**$704,442**	**$1,098,304**	**$1,485,198**	**$1,485,198**	**$1,485,198**	**$1,485,198**	**$1,485,198**	**$1,485,198**	**$1,485,198**	**$1,485,198**	**$1,485,198**	**$1,485,198**	**$1,485,198**	**$1,485,198**	**$1,485,198**	**$1,485,198**	**$1,485,198**	**$1,485,198**	**$1,485,198**
Asset Cash Flow		-$7,545,281	-$7,758,319	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377

Financial Indicators	**Rate**	
Total Debt	**7.11%**	**$10,489,853**
Total Equity	**10.00%**	**$4,813,747**
WACC (asset)	**8.02%**	

IRR	**Asset**	**11.54%**
	Project	8.36%

NPV	**Discount Rate**	
	10.00%	**($1,466,784)**
	15.00%	**($3,653,046)**
	18.00%	**($4,263,729)**
	WACC (asset)	**$506,756**

Long Term Debt / Equity Ratio	**2.18**	**2.18**	**0.00**	**0.00**	**0.00**

Gross Operational Cash Flow - Ddivends		$0	$0	$1,954,987	$1,954,987	$1,811,438	$1,802,892	$1,794,346	$1,616,614	$1,599,522	$1,582,430	$1,565,338	$1,548,246	$1,531,154	$1,514,062	$1,496,971	$1,479,879	$1,462,787	$1,454,122	$1,454,122	$1,454,122	$1,454,122	$1,454,122	$1,454,122	$1,454,122	$1,454,122	$1,454,122	$1,454,122	$1,454,122	$1,454,122	$1,454,122	$1,454,122	$1,454,122	$1,454,122	$1,454,122
Debt Service		$0	$726,884	$1,448,754	$1,396,961	$1,345,167	$1,293,373	$1,241,580	$1,189,786	$1,137,992	$1,086,199	$1,034,405	$982,611	$930,818	$879,024	$827,230	$775,437	$364,482	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076
Debt Service Coverage Ratio		**0.0**	**0.0**	**1.3**	**1.4**	**1.3**	**1.4**	**1.4**	**1.4**	**1.4**	**1.5**	**1.5**	**1.6**	**1.6**	**1.7**	**1.8**	**1.9**	**4.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

NO INPUT REQUIRED IN THIS SPREADSHEET

Name of Project	**Sichuan Tiejue 25MW Hydro Power Project**
Country	**China**

Project Cashflow

	Unit	Jan-00	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?	#NAME?
Net Revenues - 1st Product		**$0**	**$0**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**
production	(Unit)	0	0	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000	103830000
Sales price	$	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Revenues - 2nd Product		**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
production	(Unit)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sales price	$	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Revenues - Other Product		**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Production	(Unit)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Price	$	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Revenues - Carbon Credits		**$0**	**$0**	**$1,214,250**	**$1,214,250**	**$1,214,250**	**$1,214,250**	**$1,214,250**	**$1,214,250**	**$1,214,250**	**$1,214,250**	**$1,214,250**	**$1,214,250**	**$1,214,250**	**$1,214,250**	**$1,214,250**	**$1,214,250**	**$1,214,250**	**$1,214,250**	**$1,214,250**	**$1,214,250**	**$1,214,250**	**$1,214,250**	**$1,214,250**	**$1,214,250**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
ERs Production	**(tCO2e)**	0	0	101187.5265	101187.5265	101187.5265	101187.5265	101187.5265	101187.5265	101187.5265	101187.5265	101187.5265	101187.5265	101187.5265	101187.5265	101187.5265	101187.5265	101187.5265	101187.5265	101187.5265	101187.5265	101187.5265	101187.5265	101187.5265	101187.5265	0	0	0	0	0	0	0	0	0	0
ER Price	**12.0 US$/ton**																																		
Total Net Revenues		**$0**	**$0**	**$3,706,170**	**$3,706,170**	**$3,706,170**	**$3,706,170**	**$3,706,170**	**$3,706,170**	**$3,706,170**	**$3,706,170**	**$3,706,170**	**$3,706,170**	**$3,706,170**	**$3,706,170**	**$3,706,170**	**$3,706,170**	**$3,706,170**	**$3,706,170**	**$3,706,170**	**$3,706,170**	**$3,706,170**	**$3,706,170**	**$3,706,170**	**$3,706,170**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**	**$2,491,920**
(-) Total Costs		**$0**	**$0**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**	**$536,933**
(-) Operating Costs																																			
Raw Material		$0	$0	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625	$15,625
Reservior maintenance		$0	$0	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525	$13,525
Labor		$0	$0	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000	$77,000
Repairs		$0	$0	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554	$229,554
Selling Expenses		$0	$0	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890	$33,890
Water Source		$0	$0	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080	$54,080
Other		$0	$0	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000	$75,000
(-) Insurance:		$0	$0	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259	$38,259
(-) Certifications:		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
(-) Costs BS/MP ERs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
(-) Costs Valid. ERs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
(-) Due Dilig PCF ERs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
(-) Annual Verif. ERs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Margin / (EBITDA)		**$0**	**$0**	**$3,169,237**	**$3,169,237**	**$3,169,237**	**$3,169,237**	**$3,169,237**	**$3,169,237**	**$3,169,237**	**$3,169,237**	**$3,169,237**	**$3,169,237**	**$3,169,237**	**$3,169,237**	**$3,169,237**	**$3,169,237**	**$3,169,237**	**$3,169,237**	**$3,169,237**	**$3,169,237**	**$3,169,237**	**$3,169,237**	**$3,169,237**	**$3,169,237**	**$1,954,987**	**$1,954,987**	**$1,954,987**	**$1,954,987**	**$1,954,987**	**$1,954,987**	**$1,954,987**	**$1,954,987**	**$1,954,987**	**$1,954,987**
(-) D/DA machinery	3%	$0	$0	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290
(-) Interest expenses		$0	$367,723	$720,292	$668,499	$616,705	$564,911	$513,118	$461,324	$409,530	$357,737	$305,943	$254,149	$202,356	$150,562	$98,768	$46,975	-$4,819	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076
Operational Result (EBT)		**$0**	**-$367,723**	**$1,980,655**	**$2,032,448**	**$2,084,242**	**$2,136,036**	**$2,187,829**	**$2,239,623**	**$2,291,417**	**$2,343,210**	**$2,395,004**	**$2,446,798**	**$2,498,591**	**$2,550,385**	**$2,602,179**	**$2,653,972**	**$2,705,766**	**$2,732,023**	**$2,732,023**	**$2,732,023**	**$2,732,023**	**$2,732,023**	**$2,732,023**	**$2,732,023**	**$1,517,773**	**$1,517,773**	**$1,517,773**	**$1,517,773**	**$1,517,773**	**$1,517,773**	**$1,517,773**	**$1,517,773**	**$1,517,773**	**$1,517,773**
(+) Extraord. Income		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Profit before tax		**$0**	**-$367,723**	**$1,980,655**	**$2,032,448**	**$2,084,242**	**$2,136,036**	**$2,187,829**	**$2,239,623**	**$2,291,417**	**$2,343,210**	**$2,395,004**	**$2,446,798**	**$2,498,591**	**$2,550,385**	**$2,602,179**	**$2,653,972**	**$2,705,766**	**$2,732,023**	**$2,732,023**	**$2,732,023**	**$2,732,023**	**$2,732,023**	**$2,732,023**	**$2,732,023**	**$1,517,773**	**$1,517,773**	**$1,517,773**	**$1,517,773**	**$1,517,773**	**$1,517,773**	**$1,517,773**	**$1,517,773**	**$1,517,773**	**$1,517,773**
(-) Income tax	33.00%	$0	$0	$0	$0	$343,900	$352,446	$360,992	$739,076	$756,168	$773,259	$790,351	$807,443	$824,535	$841,627	$858,719	$875,811	$892,903	$901,568	$901,568	$901,568	$901,568	$901,568	$901,568	$500,865	$500,865	$500,865	$500,865	$500,865	$500,865	$500,865	$500,865	$500,865	$500,865
Net profit		**$0**	**-$367,723**	**$1,980,655**	**$2,032,448**	**$1,740,342**	**$1,783,590**	**$1,826,838**	**$1,500,547**	**$1,535,249**	**$1,569,951**	**$1,604,653**	**$1,639,354**	**$1,674,056**	**$1,708,758**	**$1,743,460**	**$1,778,161**	**$1,812,863**	**$1,830,456**	**$1,830,456**	**$1,830,456**	**$1,830,456**	**$1,830,456**	**$1,830,456**	**$1,016,908**	**$1,016,908**	**$1,016,908**	**$1,016,908**	**$1,016,908**	**$1,016,908**	**$1,016,908**	**$1,016,908**	**$1,016,908**	**$1,016,908**
(-) Dividends		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
(+) D/DA		$0	$0	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290	$468,290
(-) Investments		$7,545,281	$7,758,319	$0	$0	$0																													
Construction Engineering		$3,049,163	$3,049,163	$0	$0	$0																													
Machinery / Equipments		$1,884,400	$1,884,400	$0	$0	$0																													
Furniture & Fittings		$611,538	$611,538	$0	$0	$0																													
Temporary Engineering		$600,650	$600,650	$0	$0	$0																													
Other		$1,399,531	$1,612,569	$0	$0	$0																													
(+) Loan		$5,171,913	$5,317,940	$0	$0	$0																													
(-) CPLTD		$0	$359,161	$728,462	$728,462	$728,462	$728,462	$728,462	$728,462	$728,462	$728,462	$728,462	$728,462	$728,462	$728,462	$728,462	$728,462	$728,462	$369,301	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Free Cash Flow		**-$2,373,368**	**-$3,167,263**	**$1,720,483**	**$1,772,277**	**$1,480,170**	**$1,523,418**	**$1,566,666**	**$1,240,376**	**$1,275,077**	**$1,309,779**	**$1,344,481**	**$1,379,183**	**$1,413,884**	**$1,448,586**	**$1,483,288**	**$1,517,990**	**$1,911,852**	**$2,298,746**	**$2,298,746**	**$2,298,746**	**$2,298,746**	**$2,298,746**	**$2,298,746**	**$1,485,198**	**$1,485,198**	**$1,485,198**	**$1,485,198**	**$1,485,198**	**$1,485,198**	**$1,485,198**	**$1,485,198**	**$1,485,198**	**$1,485,198**
Asset Cash Flow		-$7,545,281	-$7,758,319	$2,277,925	$2,277,925	$2,277,925	$2,277,925	$2,277,925	$2,277,925	$2,277,925	$2,277,925	$2,277,925	$2,277,925	$2,277,925	$2,277,925	$2,277,925	$2,277,925	$2,277,925	$2,277,925	$2,277,925	$2,277,925	$2,277,925	$2,277,925	$2,277,925	$2,277,925	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377

Financial Indicators	**Rate**	
Total Debt	**7.11%**	**$10,489,853**
Total Equity	**10.00%**	**$4,813,747**
WACC (asset)	**8.02%**	

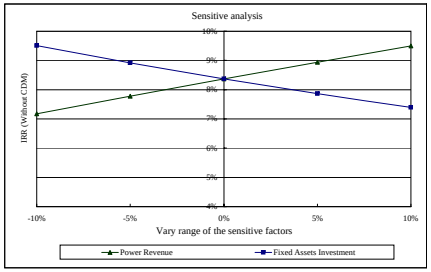
IRR	**Asset**	**25.51%**
	Project	13.40%

NPV	**Discount Rate**	
	10.00%	**$5,263,242**
	15.00%	**$984,240**
	18.00%	**($442,919)**
	WACC (asset)	**$8,039,908**

Long Term Debt / Equity Ratio		**2.18**		**2.18**		**0.00**		**0.00**		**0.00**																										
Gross Operational Cash Flow - Didivends		$0	$0	$3,169,237	$3,169,237	$2,825,337	$2,816,791	$2,808,245	$2,430,162	$2,413,070	$2,395,978	$2,378,886	$2,361,794	$2,344,702	$2,327,610	$2,310,518	$2,293,426	$2,276,334	$2,267,670	$2,267,670	$2,267,670	$2,267,670	$2,267,670	$2,267,670	$1,454,122	$1,454,122	$1,454,122	$1,454,122	$1,454,122	$1,454,122	$1,454,122	$1,454,122	$1,454,122	$1,454,122
Debt Service		$0	$726,884	$1,448,754	$1,396,961	$1,345,167	$1,293,373	$1,241,580	$1,189,786	$1,137,992	$1,086,199	$1,034,405	$982,611	$930,818	$879,024	$827,230	$775,437	$364,482	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076	-$31,076
Debt Service Coverage Ratio		**0.0**	**0.0**	**2.2**	**2.3**	**2.1**	**2.2**	**2.3**	**2.0**	**2.1**	**2.2**	**2.3**	**2.4**	**2.5**	**2.6**	**2.8**	**3.0**	**6.2**	**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**	**0.0**	**0.0**	**0.0**	**0.0**

Asset Cash Flow(without parameters change)		-$7,545,281	-$7,758,319	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377	$1,464,377
Asset Cash Flow(Investment -14%)		-$6,488,942	-$6,672,154	$1,467,863	$1,467,863	$1,467,863	$1,467,863	$1,467,863	$1,467,863	$1,467,863	$1,467,863	$1,467,863	$1,467,863	$1,467,863	$1,467,863	$1,467,863	$1,467,863	$1,467,863	$1,467,863	$1,467,863	$1,467,863	$1,467,863	$1,467,863	$1,467,863	$1,467,863	$1,467,863	$1,467,863	$1,467,863	$1,467,863	$1,467,863	$1,467,863	$1,467,863	$1,467,863	$1,467,863	$1,467,863	$1,467,863
Asset Cash Flow(Investment -10%)		-$6,790,753	-$6,982,487	$1,466,867	$1,466,867	$1,466,867	$1,466,867	$1,466,867	$1,466,867	$1,466,867	$1,466,867	$1,466,867	$1,466,867	$1,466,867	$1,466,867	$1,466,867	$1,466,867	$1,466,867	$1,466,867	$1,466,867	$1,466,867	$1,466,867	$1,466,867	$1,466,867	$1,466,867	$1,466,867	$1,466,867	$1,466,867	$1,466,867	$1,466,867	$1,466,867	$1,466,867	$1,466,867	$1,466,867	$1,466,867	$1,466,867
Asset Cash Flow(Investment -5%)		-$7,168,017	-$7,370,403	$1,465,622	$1,465,622	$1,465,622	$1,465,622	$1,465,622	$1,465,622	$1,465,622	$1,465,622	$1,465,622	$1,465,622	$1,465,622	$1,465,622	$1,465,622	$1,465,622	$1,465,622	$1,465,622	$1,465,622	$1,465,622	$1,465,622	$1,465,622	$1,465,622	$1,465,622	$1,465,622	$1,465,622	$1,465,622	$1,465,622	$1,465,622	$1,465,622	$1,465,622	$1,465,622	$1,465,622	$1,465,622	$1,465,622
Asset Cash Flow(Investment +5%)		-$7,922,545	-$8,146,235	$1,463,132	$1,463,132	$1,463,132	$1,463,132	$1,463,132	$1,463,132	$1,463,132	$1,463,132	$1,463,132	$1,463,132	$1,463,132	$1,463,132	$1,463,132	$1,463,132	$1,463,132	$1,463,132	$1,463,132	$1,463,132	$1,463,132	$1,463,132	$1,463,132	$1,463,132	$1,463,132	$1,463,132	$1,463,132	$1,463,132	$1,463,132	$1,463,132	$1,463,132	$1,463,132	$1,463,132	$1,463,132	$1,463,132
Asset Cash Flow(Investment +10%)		-$8,299,809	-$8,534,151	$1,461,887	$1,461,887	$1,461,887	$1,461,887	$1,461,887	$1,461,887	$1,461,887	$1,461,887	$1,461,887	$1,461,887	$1,461,887	$1,461,887	$1,461,887	$1,461,887	$1,461,887	$1,461,887	$1,461,887	$1,461,887	$1,461,887	$1,461,887	$1,461,887	$1,461,887	$1,461,887	$1,461,887	$1,461,887	$1,461,887	$1,461,887	$1,461,887	$1,461,887	$1,461,887	$1,461,887	$1,461,887	$1,461,887
Asset Cash Flow(Tariff -10%)		-$7,545,281	-$7,758,319	$1,299,689	$1,299,689	$1,299,689	$1,299,689	$1,299,689	$1,299,689	$1,299,689	$1,299,689	$1,299,689	$1,299,689	$1,299,689	$1,299,689	$1,299,689	$1,299,689	$1,299,689	$1,299,689	$1,299,689	$1,299,689	$1,299,689	$1,299,689	$1,299,689	$1,299,689	$1,299,689	$1,299,689	$1,299,689	$1,299,689	$1,299,689	$1,299,689	$1,299,689	$1,299,689	$1,299,689	$1,299,689	$1,299,689
Asset Cash Flow(Tariff -5%)		-$7,545,281	-$7,758,319	$1,382,033	$1,382,033	$1,382,033	$1,382,033	$1,382,033	$1,382,033	$1,382,033	$1,382,033	$1,382,033	$1,382,033	$1,382,033	$1,382,033	$1,382,033	$1,382,033	$1,382,033	$1,382,033	$1,382,033	$1,382,033	$1,382,033	$1,382,033	$1,382,033	$1,382,033	$1,382,033	$1,382,033	$1,382,033	$1,382,033	$1,382,033	$1,382,033	$1,382,033	$1,382,033	$1,382,033	$1,382,033	$1,382,033
Asset Cash Flow(Tariff +5%)		-$7,545,281	-$7,758,319	$1,546,721	$1,546,721	$1,546,721	$1,546,721	$1,546,721	$1,546,721	$1,546,721	$1,546,721	$1,546,721	$1,546,721	$1,546,721	$1,546,721	$1,546,721	$1,546,721	$1,546,721	$1,546,721	$1,546,721	$1,546,721	$1,546,721	$1,546,721	$1,546,721	$1,546,721	$1,546,721	$1,546,721	$1,546,721	$1,546,721	$1,546,721	$1,546,721	$1,546,721	$1,546,721	$1,546,721	$1,546,721	$1,546,721
Asset Cash Flow(Tariff +10%)		-$7,545,281	-$7,758,319	$1,629,065	$1,629,065	$1,629,065	$1,629,065	$1,629,065	$1,629,065	$1,629,065	$1,629,065	$1,629,065	$1,629,065	$1,629,065	$1,629,065	$1,629,065	$1,629,065	$1,629,065	$1,629,065	$1,629,065	$1,629,065	$1,629,065	$1,629,065	$1,629,065	$1,629,065	$1,629,065	$1,629,065	$1,629,065	$1,629,065	$1,629,065	$1,629,065	$1,629,065	$1,629,065	$1,629,065	$1,629,065	$1,629,065
Asset Cash Flow(Tariff +15%)		-$7,545,281	-$7,758,319	$1,711,409	$1,711,409	$1,711,409	$1,711,409	$1,711,409	$1,711,409	$1,711,409	$1,711,409	$1,711,409	$1,711,409	$1,711,409	$1,711,409	$1,711,409	$1,711,409	$1,711,409	$1,711,409	$1,711,409	$1,711,409	$1,711,409	$1,711,409	$1,711,409	$1,711,409	$1,711,409	$1,711,409	$1,711,409	$1,711,409	$1,711,409	$1,711,409	$1,711,409	$1,711,409	$1,711,409	$1,711,409	$1,711,409

	-14.00%	-10%	-5%	0%	+5%	+10%	+15%
Investment	10%	9.51%	8.91%	8.36%	7.86%	7.39%	--
Power Revenue	--	7.18%	7.78%	8.36%	8.94%	9.50%	10%



Total IRR (After-tax)

Vary Range	Investment	IRR（%）
-14%	$12,503,041	10.02%
-10%	$13,773,240	9.51%
-5%	$14,538,420	8.91%
0%	$15,303,600	8.36%
5%	$16,068,780	7.86%
10%	$16,833,960	7.39%

Vary Range	Power Revenue	IRR（%）
-10%	$2,242,728	7.18%
-5%	$2,367,324	7.78%
0%	$2,491,920	8.36%
5%	$2,616,516	8.94%
10%	$2,741,112	9.50%
15%	$2,878,168	10.05%