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Dear Sir or Madam,

Please find below the response to the request for review for the CDM project with the title "Yunnan Jinping Miao-Yao-Dai Autonomous County Kesikou Hydropower Station", with the registration number 2064, In case you have any further inquiries please let us know as we kindly assist you.

Best regards

Thomas Kleiser  
Carbon Management Service

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**Attachment:**

Revised information reference list (IRL)

**Enclosure:**

1. Statement of total investment in November 2008
2. Loan Contract
3. Grid price document of Yunnan Province in 2006
4. Payroll list

## **Response to the CDM Executive Board**

- 1. The DOE is requested to further clarify and provide evidence on the suitability of the input values to the investment analysis as per the requirement of EB 38 paragraph 54(c) guideline, including grid price for electricity.**

### **Response from the project participant:**

#### *Background:*

*54. the Board clarified that in cases where project participants rely on values from Feasibility Study Reports (FSR) that are approved by national authorities for proposed project activities, DOEs are required to ensure that*

*(c) On the basis of its specific local and sectoral expertise, confirmation is provided, by cross-checking or other appropriate manner, that the input values from the FSR are valid and applicable at the time of the investment decision.*

The input values for investment analysis were from the Feasibility Study Report Financial Analysis (FSR Financial Analysis) of Yunnan Jinping Miao-Yao-Dai Autonomous County Kesikou Hydropower Station (hereafter referred to as "the project") which is compiled by Yunnan Lingyu Hydropower Power Reconnaissance Co., Ltd. in July 2007. Yunnan Lingyu Hydropower Power Reconnaissance Co., Ltd. is an independent organization with qualification to compile design reports for hydropower projects (it has obtained C grade in reconnaissance and hydro-power design, issued by Yunnan Province Construction Bureau). In addition, the FSR Financial Analysis was approved by local DRC in August 2007, and then the CDM and investment decision was made on September 2007 (September 10, 2007 which is the date of contract signed with construction supervising company and is the earliest starting date of the project), therefore it is reasonable to conduct the investment analysis based on the input value of FSR Financial Analysis in the PDD requesting for registration.

In order to further demonstrate the input values for investment analysis is appropriate and reasonable, the cross-check of the important parameters has been considered.

### **Total static investment**

Since the project is postponed due to the earthquake in the project site, till now, the project has not finished yet. But the project owner had invested more than 78,000,000 Yuan RMB<sup>1</sup> in the project by the November 2008. In addition, in December 2008 the project owner have just received 50,000,000 Yuan RMB<sup>2</sup> bank loan for construction of the project. Thus, the actual total investment of the project must be more than 128,000,000 Yuan RMB, which is higher than the estimated total static investment of 113,569,100 Yuan RMB in FSR Financial Analysis. In addi-

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<sup>1</sup> According to the statement issued by the Engineering Project Supervisor (a third party), till the November 2008, the project has invested more than 78,000,000 Yuan RMB and the total static investment will exceed 128,000,000 Yuan RMB.

<sup>2</sup> The loan contract signed by the project owner and Agriculture Bank of China

tion, in the statement issued by the Engineering Project Supervisor, it is also mentioned that the total static investment will exceed 128,000,000 Yuan RMB. Therefore, the estimated total static investment used for IRR calculation in PDD requesting for registration was applicable and conservative to calculate the IRR.

### **Grid price**

The estimated grid price of the project as per the approved FSR Financial Analysis was 0.252 Yuan RMB/kWh including VAT which is higher than the grid price in Yunnan province Because:

1. The actual grid price will be in line with: (a) the document [2004]1037 published by NDRC in 2004, the grid price is 0.215 Yuan RMB/kWh including VAT for hydropower stations, whose electricity is supplied to the provincial grid directly; (b) document (Yunfagaijiage [2006]28) published by Yunnan Province DRC in 2006, the grid price is still 0.215 Yuan RMB/kWh including VAT for the hydropower Stations, whose electricity is supplied to the provincial grid directly.
2. The project will complete in July 2009, the Power Purchase Agreement will be signed in May 2009, therefore, we cannot get the real grid price of the project, but the grid price will strictly confirmed according to the document published by local government.

In China, the grid price is strictly regulated by China government and it is established on strict regulation rather than the market mechanism, so it is hard to forecast the future grid price by the project owner. As the grid price is related tightly to the national economy and livelihood of people, the government of China has to make the grid price steady. During the five years from 2004 to 2008, the grid price is 0.215 Yuan RMB/kWh in Yunnan Province. For all subsequent years the grid price 0.215 Yuan RMB/kWh will most likely to be achieved. According to the above analysis, the fixed grid price used in the IRR calculation is reasonable during the whole operating period of the project. Therefore, the grid price used in the PDD requesting for registration is reasonable and conservative.

### **O&M cost**

The O&M cost is calculated also according to the parameters from the approved FSR Financial Analysis. The annual O&M cost includes overhaul cost, payroll and welfare of employees, cost of material, and other cost. All these parameters are derived from the FSR Financial Analysis and are consistent with the applicable "Economic Evaluation Code for Small Hydropower Projects SL16-95" (hereinafter refers "the document SL16-95"). The parameters using to calculate the O&M costs of the project have been analyzed respectively:

- Based on the above document SL16-95, regarding to a hydropower project with an installed capacity greater than 6MW, the minimum employees should be 48 persons, but based on the FSR Financial Analysis, the IRR calculation of the PDD uses 38 persons, which is a fixed value for the project and more conservative;
- Based on the above document SL16-95, the average rate of overhaul cost is 1%, which is fixed value and consistent with the IRR calculation of the PDD;
- Based on the above document SL16-95, the average value of other cost is 12 Yuan/kW, which is fixed value and consistent with the IRR calculation of the PDD;
- Based on *the document SL16-95*, the welfare fund for employees should be 14% of the total wage, which is fixed and consistent with the IRR calculation of the PDD. Based on the relevant regulations published by China government, the maximum value of the employee's insurance is about 26% of the total wage, which is fixed and consistent with the value in the IRR calculation of the PDD; the range of the housing provident fund is

about 5%-12% of the total wage, which is fixed and consistent with the value of 10% in the IRR calculation of the PDD.

● Based on the FSR Financial Analysis, the IRR calculation uses 10,000 Yuan RMB/Person annually. But according to the payroll record of employees of the project owner company, the actual average payroll of the employees is 14,400 Yuan RMB/Person annually<sup>3</sup>, which is higher than the payroll in FSR Financial Analysis. Therefore, the value of the payroll used for IRR calculation is more conservative and credible.

Therefore, from the analysis above most parameters of O&M Cost are fixed, and only the payroll of the employees may be fluctuated. In addition, the average increasing rate of average payroll in Yunnan province was 9.64% (Yunnan province index) from 2002 to 2006<sup>4</sup>. It is clear that the salaries are increasing rapidly (and can be expected to keep rising).

In conclusion, considering the increase of employees' payroll and other fixed indexes of O&M cost, the O&M cost used for IRR calculation is conservative and credible.

### **Annual power supplied to the grid**

The project will start power generation in July 2009, so we cannot get the actual power generation data for cross-check. But according to FSR, the annual power supplied to the grid was estimated based on the 45-year hydrological data (1958 to 2002). Hence, it is impossible to change the annual power supplied to the grid greatly.

Furthermore, from the design electricity generation value of 81,200MWh, which is multiplied by the "coefficient of effective electricity generation" of 0.95, confirmed according to document SL16-95. It is said in the document SL16-95 that for grid connected no regulating hydropower stations, the coefficient of effective electricity generation should be 0.80-0.90. But in the FSR Financial Analysis the coefficient of effective electricity generation is 0.95 which is already higher than the design regulation of hydropower project. It is already over estimated the power supplied to the grid in the FSR Financial Analysis. The remaining electricity amount (77,140MWh), 1%<sup>5</sup> was also deducted as auxiliary power consumption, which is based on the FSR Financial Analysis and relevant design regulation. Therefore, it is reasonable and conservative in the calculation of power supplied to the grid.

Therefore, it is impossible to increase the IRR through increasing the power supplied to the grid.

From the cross-check analysis above, it is obviously that the actual total static investment and O&M cost will be higher than the estimated values, the grid price of electricity will be lower than the estimated value. Therefore, it is reasonable and conservative to use the estimated value in the FSR Financial Analysis to calculate IRR.

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<sup>3</sup> Payroll of employees in the project owner company

<sup>4</sup> China Statistics Year Book 2003-2007 (<http://www.stats.gov.cn/tjsj/ndsj/>)

<sup>5</sup> According to the Hydroenergy design code for small hydro power projects (SL76-94) issued by the Ministry of Water Resources of People's Republic of China, the auxiliary power consumption rate of 1% in the FSR Financial Analysis is reasonable,, which is fixed and consistent with the value in the IRR calculation of the PDD.

## **Response from DOE:**

The Board clarified that in cases where project participants rely on values from Feasibility Study Reports (FSR) that are approved by national authorities for proposed project activities, DOEs are required to ensure that (EB 38 paragraph 54):

*(c) On the basis of its specific local and sectoral expertise, confirmation is provided, by cross-checking or other appropriate manner, that the input values from the FSR are valid and applicable at the time of the investment decision.*

At first TÜV SÜD can confirm, that the approved FSR was the basis of the decision to proceed with the investment in the project. The final Feasibility study report was prepared by the "Yunnan Province/Yunnan Lingyu Hydropower Reconnaissance Institute Co., Ltd" which is an independent organization with qualification to compile design reports for hydropower projects (it has obtained C grade in reconnaissance and hydropower design, issued by Yunnan Province Construction Bureau) in July 2007 (IRL 24) and approved in August 2007 (IRL 25). The early starting date of the project is the date of contract signed with construction supervising Company on September 10, 2007 (IRL 27).

The values used in the PDD and the IRR calculation are fully consistent with the FSR and comply with the EB 38, paragraph 54 (a) and (b).

Regarding EB38 paragraph 54 section c we present our thorough assessment below.

### **Total static investment**

As it is mentioned in the project participant's response above the projects construction was postponed due to an earth quake at the project site. But the project owner had invested more than 78,000,000 Yuan RMB in the project by the November 2008, as could be evidenced by Statement of Total Investment of Kesikou Hydropower Station, by Kunming Xinxing Hydropower Project Construction Supervisor Company, on 30th November, 2008 (IRL 44). In addition, in December 2008 the project owner have just received the 50,000,000 Yuan RMB bank loan for construction of the project (IRL 43). Thus, the actual total investment of the project is expected to exceed 128,000,000 Yuan RMB, which is higher than the estimated total static investment of 113,569,100 Yuan RMB which is mentioned in FSR Financial Analysis. This argument was further strengthened with help of the statement issued by the Engineering Project Supervisor, in which is mentioned that the total static investment will exceed 128,000,000 Yuan RMB (IRL 44). So the estimated total static investment utilized in the financial analysis is conservative and applicable to calculate the IRR of the project.

### **Grid price**

The estimated grid price of the project was 0.252 Yuan RMB/kWh including VAT (mentioned in FSR), which is higher than grid price in Yunnan province.

The following documents are the basis for the actual grid price

There are indicators that the actual grid price in Yunnan province is constantly 0.215 Yuan RMB/kWh, as could be evidenced by the following documents:

- The document [2004]1037 published by NDRC in 2004, the grid price is 0.215 Yuan RMB/kWh including VAT for hydropower stations, whose electricity is supplied to the provincial grid directly.
- The document (Yunfagaijiage [2006]28) published by Yunnan Province DRC in 2006, the grid price is still 0.215 Yuan RMB/kWh including VAT for the hydropower Stations, whose electricity is supplied to the provincial grid directly.

As projects completion is expected in July 2009, the project participants are unable present any further evidence of the real grid price of the project (such as power purchase agreement) as of now. However all available information suggests concluding that the real tariff can be expected to be lower than the 0.252 Yuan RMB/kWh anticipated in FSR; thus it is conservative to apply this value in the CDM context. It is ensured that the grid price will strictly be regulated.

### **O&M cost**

All the parameters are resulting from the FSR financial analysis and are consistent with the "Economic Evaluation Code for Small Hydropower Projects SL16-95" (IRL 42). The O&M costs have been calculated according to the guidelines of the SL-16-95 benchmark document. The values have been cross-checked with the "Inform of Water Charge" in Yunnan province published by local government. Furthermore payrolls of the employees have been crosschecked.

Base on the FSR, The salaries of the employees in IRR calculation uses 10,000 Yuan RMB/Person annually but according to payroll record of employees, the actual average payroll of the employees is 14,400 Yuan RMB/Person annually (IRL 39), which is higher than the payroll in FSR Financial Analysis.

We can conclude that fluctuating salaries have a high impact on the O&M costs. Following the statistical data from Chinese government, the average annual increase of the salary price index is 9.64% from 2002~2006. If the O&M costs are assumed to increase by 9.64% annually, the IRR would be much lower than the one submitted for registration. Hence the approach to calculate with fixed O&M costs can be considered as conservative and reasonable.

Thus all available indicators suggest concluding that O&M costs have increased. Hence the assumptions in the FSR have been conservative, plausible and reasonable.

### **Conclusion with regard to grid price and O&M costs**

TÜV SÜD is strongly convinced that applying fixed input values (tariffs and O&M costs) in the IRR calculation is appropriate in the context of the project activity. There are a number of reasons which helps to these conclusions, described here for case 2064.

The project applies the benchmark SL-16-95, economic Evaluation code for small hydropower, P.R China Industry Standard, Standard no.SL 16-1995 (IRL, 10). According to this document, it is clearly described that the parameters used in the calculation should be constant throughout the assessment period. In order to comply with the benchmark criteria: "In the financial evaluation, when calculating input and output, the current price shall be used".

In CDM assessment, TÜV SÜD has reviewed dozens of feasibility study reports for renewable energy projects in China. It can be confirmed that the above guideline is consistently applied as

common practice in China; all feasibility studies make use of fixed input parameters for O&M and tariff.

### **Annual power supplied to the grid**

As the project is expected to become operational in July 2009, it is not possible as of now to cross check the estimated annual power supply to the actual supply. However TÜV SÜD is convinced that the estimated power generation is accurate for the following reasons:

- the annual power supplied to the grid was estimated based on the 45-year hydrological data (1958 to 2002)
- the estimate was made by “Yunnan Province/Yunnan Lingyu Hydropower Reconnaissance Institute Co., Ltd” which is an independent organization with qualification to compile design reports for hydropower projects (it has obtained C grade in reconnaissance and hydropower design, issued by Yunnan Province Construction Bureau)
- the estimate as used here in the CDM context was consistently assumed at the time of investment decision (i.e. to obtain the governmental approval (IRL 24, 25))



**2. Further justification is required how the power output of this project activity can be accurately and separately monitored from the Dapo hydropower station.**

**Response from the project participant:**

The electricity generated by the project will combine the electricity generated by the Yunnan Jinping Dapo Hydropower Station (here after as “Dapo Hydropower Station”), which has been also registered as a CDM project, and then the electricity generated by the two projects will be exported to the Xinqiao Transformer Substation, which belongs to the Grid Company. (More details please see the electricity connection figure below).

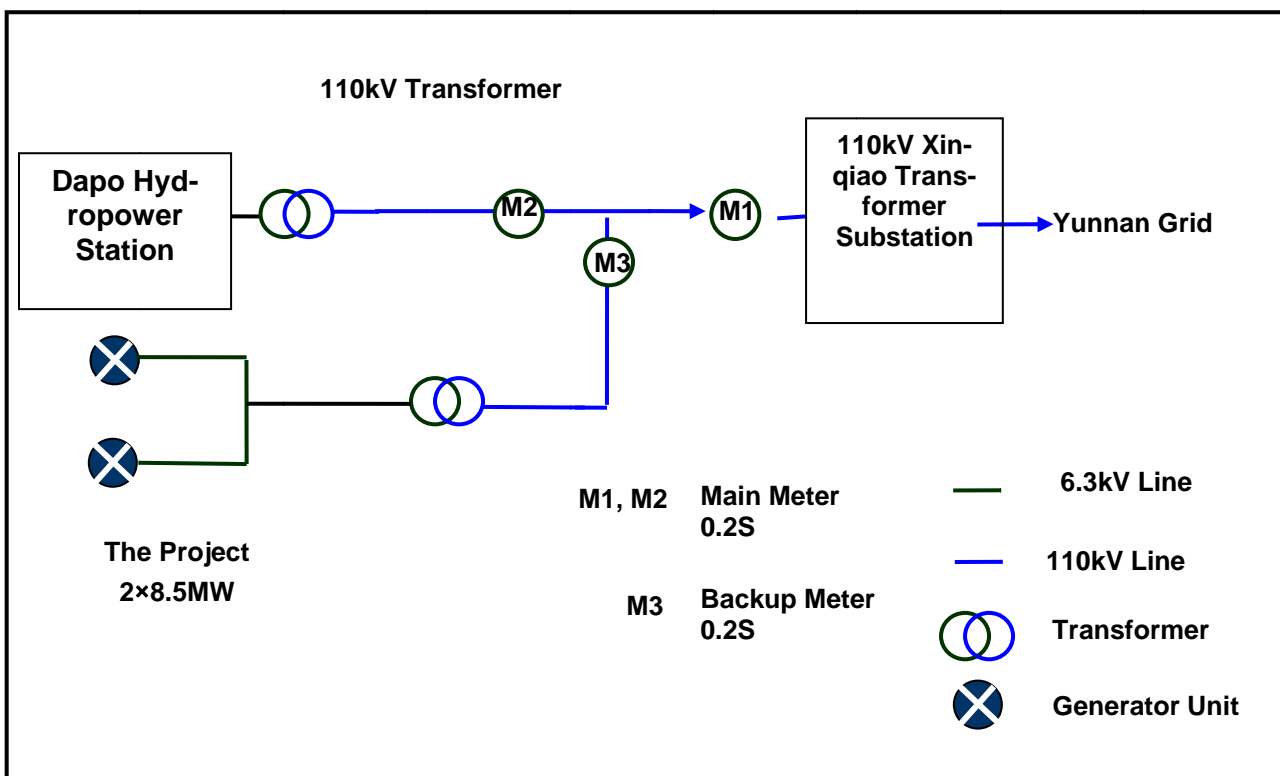
Three meters (bi-directional) will be required, of which, The first meter (M1, main meter, 0.2S), which is located at the input of the Xinqiao Transformer Substation of the Grid Company, will be employed to measure the power supplied to the grid by the project and Dapo Hydropower Station (M1<sub>a</sub>) and the power supplied to the two power stations by the grid (M1<sub>b</sub>).

The second meter (M2, main meter, 0.2S), which is located at the exit of Dapo Hydropower Station, will be employed to measure the power supplied to the grid by the Dapo Hydropower Station (M2).

The third meter (M3, backup meter, 0.2S), which is located at the exit of the project will be employed to measure output electricity of the project (M3<sub>a</sub>), and the power supplied to the project from the grid (M3<sub>b</sub>).

M1 and M2 will be monitored by the grid company; M3 will be monitored by the project owner.

**Figure 1. Electricity Connection**



The electricity supplied to the grid by the project should be calculated as follows:

$$EG_{s,y} = M1_a - M2$$

$$PR_{g,y} = M1_b^6$$

$$EG_y = M1_a - M2 - M1_b$$

It is reasonable, accurate and conservative because:

1. Dapo Hydropower Station was registered as CDM project<sup>7</sup>. According to the registered PDD of Dapo Hydropower Station (Registered Number 1779), the main meter was M2 in the Figure 1 which is consistent with the monitoring plan of the project, namely the power supplied to the grid by the Dapo Hydropower Station is measured by the meter M2 in the Figure 1. In addition, M2 was monitored by both the grid company (a third party) and the project owner of Dapo Hydropower Station. Therefore, it can be accurately separate the power supplied to the grid by the Dapo Hydropower Station.
2. For the project, the grid company will also monitor M1 (measured the power supplied to the grid by the project and Dapo Hydropower Station) in Figure 1. And the grid company will account the electricity sale revenues according to the M1 and M2 ( $M1_a - M2$ ).
3. The calculation of the power supplied to the grid is more conservative since all the line loss (from the project and Dapo Hydropower Station to Xinqiao Transformer Substation) of Dapo Hydropower Station and the project will be deduct from the electricity supplied to the grid by the project. In addition, the power supplied to Dapo Hydropower Station and the project by the grid as the power supplied to the project by the grid for conservative purpose.

Therefore, the power supplied to the grid by the project can be accurately and separately monitored from the Dapo Hydropower Station.

### **Response from DOE:**

At first TÜV SÜD can confirm that three meters will be installed as required and power generated by the proposed project will join the electricity produced by another registered project named "Yunnan Jinping Dapo Hydropower Station". Based on the installation of three meters, it is clear that the generated electricity from the proposed project and the Yunnan Jinping Dapo Hydropower Station will be measured separately. The electricity generated by "Yunnan Jinping Dapo Hydropower Station" and electricity delivered to the meter Xinqiao Transformer Substation will be monitored by the grid company while the electricity generated by the proposed project will be monitored by the project participants. TÜV SÜD confirms that the approach of monitoring the electricity is applicable and plausible.


The total electricity produced by both project will be transferred to the Xinqiao Transformer Substation, which belongs to the Grid Company. More detail can be seen in figure 1 of project participant's response.

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<sup>6</sup>  $M1_b$  measures the power used by both Dapo Hydropower Station and the project supplied by the grid company, it is conservative to use this data as power imported to the project by the grid.

<sup>7</sup> <http://cdm.unfccc.int/Projects/DB/TUEV-SUED1207586067.14/view>



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Reference No.	Document or Type of Information
16.	Questionnaires, meeting record, sign-in record and newspaper bulletin of the stakeholders' meeting , March 27 <sup>th</sup> ,2007.
17.	Business License, July 26 <sup>th</sup> , 2006.
18.	The evidence for consideration CDM before construction of the project: Directorate Meeting Summary by Jinping Xingguang Electricity Generation Co. Ltd. on Accelerating the CDM Application of Yunnan Jinping Miao-Yao-Dai Autonomous County Kesikou Hydropower Station, dated September 3, 2007
19.	IRR calculation table
20.	The time schedule of the proposal project, including the evidence of starting construction
21.	Staff training plan ,June 26 <sup>th</sup> ,2006,Jingping Xingguang Electricity Generation Co.,Ltd.
22.	Approval of utilizing water resource ,April 11 <sup>th</sup> ,2007, Bureau of Water Resource of Honghe Hani and Yi Prefecture.
23.	The purchasing contract for generation units, dated on Oct. 9, with Sichuan Dongfeng generators Co. Ltd.
24.	Feasibility Study Report Financial Analysis of Kesikou Hydropower Station, July 1 of 2007. Lingyu Water Conservancy and Hydropower Survey and Design Co.,Ltd, Yunnan Province/Yunnan Lingyu Hydropower Reconnaissance Institute Co., Ltd.
25.	Approval of the Feasibility Study Report Financial Analysis as a reply of Yunnan Jinping Miao-Yao-Dai Autonomous County Kesikou Hydropower Station, August 10, 2007, Local Development and Plan Bureau
26.	Directorate Meeting Summary by Jinping Xingguang Electricity Generation Co., Ltd. On Accelerating the CDM Application of Yunnan Jinping Miao-Yao-Dai Autonomous County Kesikou Hydropower Station, September 3, 2007, Jinping Xingguang Electricity Generation Co., Ltd.
27.	Start construction of the main body of the project, <i>Surveillance contract of Jinping Kesikou Hydropower Station, September 10, 2007, Kunming Xinxing Hydropower Project Construction Surveillance Company.</i>
28.	The evidence of Geography coordinators, Lingyu Water Conservancy and Hydropower Survey and Design Co.,Ltd, Yunnan Province
29.	Technical Administrative Code of Electric Energy Metering (DL/T448 - 2000)
30.	LoA from NDRC in China and MoC , submitted on April 24 of 2008.
31.	an intentional board decision for applying for CDM, dated on Nov. 10 of 2006,
32.	Investment situation certification, dated on May 4 of 2008. By Jinping Xingguang Electricity Generation Co. Ltd.
33.	The evidences for common practice analysis
34.	Quoted price of Kesikou Hydropower Station, April 28, 2007, The construction company: Luoping Jiulong Construction Co., Ltd.
35.	Constitution of Jinping Zhongtai Investment Development & Management Co., Ltd., January 16, 2007, Jinping Zhongtai Investment Development & Management Co., Ltd.

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Reference No.	Document or Type of Information
36.	Capital balance sheet by Wan Lingli, dated on July 31, 2008, Jinping Xingguang Electricity Generation Co., Ltd.
37.	Notice on trial Electricity Grid Price Provision for Newly Constructed Hydropower Stations during Flood and Drought Periods, by the Development and Reform Committee of Yunnan Province. in 2006, Yunfagaijiage [2006] 28.
38.	Decide on building a unified social insurance system for employee of company, by State council, Guofa [1997] 26
39.	Payroll list for new employees of Jinping Xingguang Electricity Generation Co. Ltd, dated on December 1, 2008
40.	Instruction on Housing Funding management, dated in Jan 20005, by Ministry of Housing and Urban-rural Development of P.R. China [2005] 5.
41.	Hydroenergy design code for small hydro power projects, in May 1994, by Ministry of Water Resources of P.R. China
42.	Economic Evaluation Code for Small Hydropower Projects, SL16-95,in July 1995, by Ministry of Water Resources of P.R. China
43.	Loan Contract, between Jinping Xingguang Power Generation Co., Ltd. and Agriculture Bank of China, Jinping Branch, 16th Dec 2008.
44.	Statement of Total Investment of Kesikou Hydropower Station, by Kunming Xinxing Hydropower Project Construction supervisor company, on 30th November, 2008