TÜV SÜD Industrie Service GmbH · 80684 Munich · Germany

Industrie Service

Choose certainty.
Add value.

DAP-PL-2885.99
DAP-IS-2886.00
DAP-PL-3089.00
DAP-PL-2722
DAP-IS-3516.01
DPT-ZE-3510.02
ZLS-ZE-219/99
ZLS-ZE-246/99

Your reference/letter of	Our reference/name	Tel. extension/E-mail	Fax extension	Date/Document	Page
	IS-CMS-MUC/RZ Rachel Zhang	+49 89 5791-3038 rachel.zhang@tuev-sued.de	+49 89 5791-2756	2009-01-09	1 of 7

Dear Sirs,

Please find below the response to the review formulated for the CDM project with the title *"Shimenkai Hydropower Project*" with the registration number 2167. In case you have any further inquiries please let us know as we kindly assist you.

Best regards

Rachel Zhang
Carbon Management Service

Industrie Service

Response to the CDM Executive Board

Request 1:

Further clarification is required on how the DOE has validated: a) the input values for the investment analysis as per EB 38 paragraph 54(c) guidance; and b) the suitability of the 10% benchmark (1995) when assessing the additionality with investment decision made in 2005.

Response from PP:

(a):

According to the EB 38 paragraph 54(c), it demonstrates that the input values from the FSR should be confirmed to be valid and applicable at the time of the investment decision by cross-checking or in other appropriate manners on the basic of its specific local and sectoral expertise.

To comply with the EB 38 paragraph 54 (c) guidance, we would like to provide further explanation to those important input values adopted for IRR calculation in the PDD. And DOE could cross-check those values using the actual data or referring to the available documents of other similar project activities as follows.

[The input data of Bus-bar tariff]

In 18th Feb., 2004, a Notice on Adjusting the Bus-bar tariff of Power Plants in Lijiang City was issued by Lijiang Development and Plan Committee[1]. Thus the project owner adopted this fixed bus-bar tariff 0.16 yuan/kWh (with VAT) as an input value in the financial analysis of the PDD. For the reason that this value was published and known by the project owner prior to the investment decision by means of the Board resolution, it is applicable for the financial analysis of the project.

And according to the Electricity Settlement Invoice between the project owner and the Grid Company, the actual bus-bar tariff for the project is 0.16 Yuan/kWh (with 6%VAT, this VAT is based on the Power Purchase Contract, which is also a common value for the small hydropower plant in China)[2], which is consistent with the price adopted in the PDD. This comparison confirms that the value in the PDD is applicable.

[The input data of the Total Investment]

The Total Investment in FSR and Actual Values

[1] Notice on Adjusting the Bus-bar tariff of Power Plants in Lijiang City was issued by Lijiang Development and Plan Committee on 18th Feb., 2004.

[2] Electricity Settlement Invoices between the project owner and the Grid Company.

Industrie Service

Source	Value	Conclusion
FSR	57.987 million yuan	The actual investment is about 0.66% higher than the designed total investment in FSR.
Project Settlement Report	58.368 million yuan	

The fixed assets investment of 57.987million yuan applied in PDD is derived from the FSR. This value from FSR could be crossed-checked by the actual total cost derived from the "Project Settlement Report" of the project activity issued by the Lijiang Gaoyuan Certified Accountant Office insuring its validity and applicability on 16th May, 2008. Expired by this time, the project total investment has been already completed. This "Project Settlement Report" indicates that the total investment happened after the project's completion amounts to 58.368 million yuan which is 0.66% higher than the total investment in FSR[3].

We have also provided the contracts of Engineering project, Water diversion project, Penstock project, the scientific research survey & design project etc as well as the various invoices of turbine and generator equipment together with the invoices of material costs which have covered the actual total investment to the DOE for double-checking.

[The input data of Operations and Maintenance Cost (O&M Cost)]

Although the value of the O&M cost is an insensitive factor, which is calculated according to the data from the approved FSR thus strictly executed with the relevant national regulations. The O&M cost mainly include staff charges (wages, welfare, insurance and housing fund), material cost and other costs, water resources fee, repair cost, insurance for fixed assets. And the staff charges is a main component of the O&M cost which is easily influenced by the external factor such as the national development. However, according to the information published by the Bureau of Labor and Social Security of Yunnan Province, the actual average increasing rate of enterprises' wage was 12%, 11%, 13% and 12%[4] respectively from 2005 to 2008. It could be drawn that the salary of the enterprise staff has been on the rising tendency. Moreover, most of the other parts of O&M cost are comparatively stable. For example, the water resources fee of the project is 0.004yuan/kWh, which confirms to the Temporary Management Methods on Collection Standard of Water Resource fee of Yunnan Province[5], announcing that the water charge of hydropower station in Yunnan Province should be 0.001-0.01yuan/kWh. Therefore, we can find out that the actual O&M cost in operating phase of the project will be higher than the data in IRR calculation.

In additional, the unitary O&M cost 0.028 yuan/kWh (the annual O&M cost 1.43million yuan divided by the annual power generation 51300MWh from the FSR) of the project has been confirmed to be a reasonable and conservative value according to the range 0.04-0.09 yuan/kWh[6].

In conclusion, adopting the data from the FSR for IRR analysis is reasonable and more conservative if compared with the predicted actual values.

[3] The Project Settlement Report issued by the Lijiang Gaoyuan certified accountant office on 16th May, 2008.
[4] The average increasing rate for enterprises' wage from 2005 to 2008 issued by the Bureau of Labor and Social Security of Yunnan Province.
[5] http://www.wcb.yn.gov.cn/end/index.jsp?Info_ID=85
[6] http://news.xinhuanet.com/stock/2004-12/03/content_2290984.htm

Industrie Service

[The input data of Operation hour]

The annual operational hour of the proposed project is 5130 hours. This expected data is derived from scientific analysis on the 38 years' historical hydrological observation data during 1958 to 1996 by an independent third party Mujiaqiao Hydrologic Station. It also has been assessed by the experts and got approved by the Lijiang Water Conservation Bureau[7]. Therefore, the value of operation hour from FSR is reasonable to be used for IRR calculation.

As shown above, it can be clearly concluded that the input values of the investment analysis, which were known before the investment decision, are suitable and appropriate through the cross check with other credible and reliable data sources and which is consistent with the EB 38 guidance, paragraph 54(c) guidance.

[The input data of Interest rate]
According to the FSR, the annual interest rate of the loan for the proposed project was 6.12%, while based on the Loan Contract signed by the project owner and Agricultural Bank of China on 25/04/2007[8] , it executed a loan interest rate of 7.81%, which was higher than the loan rate used in FSR. In other words, the loan interest rate adopted in FSR was conservative.

(b):
The benchmark of 10% is adopted from the "Economic Evaluation Code for Small Hydropower Projects (SL16-95)[9] ". This code was issued by the Ministry of Water Resources of the People's Republic of China (MWR) and became officially effective on 01/07/1995. In this document, the small hydropower project is defined as the installed capacity lower than 25MW. The installed capacity of the proposed project activity is 10MW. The code is thus appropriate for the proposed project.

Since then, no new document prescribing benchmark for hydropower plants have been released by the Government, nor has the validity of this benchmark been repudiated in any way. However, its applicability was confirmed by the Ministry of Water Resources of the People's Republic of China in 2002 in the "Bulletin of Valid Hydropower Technical Standard" (document No• 2002• 07)[10] . And no new regulation has taken over the effectiveness of this code. It shows that the 10% benchmark was applicable at the time of the decision making in 2005 (and still remains in effect today). Additionally, on 09/09/2006, the MWR announced that this regulation was still effective[11] . In accordance with it, the SL16-95 code is still valid and enforceable. In fact, since 1995, hydropower design institutes in China have widely applied this code and the 10% benchmark when developing Feasibility Study Report (FSR) for small-scale hydropower projects. The 10% benchmark given in this code is the most specific benchmark for small hydropower projects and represents common practice for Chinese investment decision processes.

To conclude, we consider a 10% benchmark is suitable for our project benchmark chosen given the fact it comes from an officially published guidance for small scale hydropower projects

[7] The Approval Document on Water Resources Report of Shimenkai Hydropower issued by the Lijiang Water Conservation Bureau on 18th Feb., 2004.
[8] The Loan Contract signed by the project owner and Agricultural Bank of China on 25/04/2007
[9] http://www.cws.net.cn/guifan/bz%5CSL16-95
[10] Bulletin of Valid Hydropower Technical Standard issued by MWR of PRC on 12th Jun., 2002.
[11] Announcement on the Current Effective Technical Standard issued by MWR on 9th Sep., 2006.

Industrie Service

which is effective at the time of investment decision and thus is in accordance with EB requirements.

Response from DOE:

(a):

The input data in the investment analysis is taken from the Feasibility Study Report (FSR), which was completed in Feb. 2004.

TÜV SÜD performed a thorough evaluation and review of the values of the input parameters applied for the investment analysis for this project. As part of this evaluation, TÜV SÜD checked the credibility and plausibility of the input data by comparing the applied values with TÜV SÜD's internal statistical results of the evaluation of 250 hydropower projects in China that are either already registered or currently under validation. Further we crosschecked the values were possible with actual contacts and invoices.

Investment costs were calculated at approximately 5.7987 Mio RMB/MW, which are lower than the average cost of 6.7 Mio RMB/MW based on TÜV SÜD's internal statistics and and is considered to be conservative. Furthermore, according to "Settlement Report of Shimenkai Hydropower Project"(IRL No.1) which was issued by the third financial party when the project was constructed--- Lijiang Gaoyuan Public Accounting Firm on May.16th 2008. The actual investment of the proposed project is 5.8368 Mio RMB/MW which is 0.66% higher than the designed total investment in FSR. It further demonstrates the conservativeness of the financial analysis approach. The actual investment of the proposed project is 5.8368 Mio RMB/MW which is 0.66% higher than the designed total investment in FSR. It further demonstrates the conservativeness of the financial analysis approach.

Annual **O&M costs** is 1.43 Mio RMB in FSR, which is equal about 2.5% of the total investment costs, and are consistent with the average of 2.5% based on TÜV SÜD's internal statistics. Furthermore the salary sheets of the project have been checked. The applied costs in the FSR are actually lower than the real costs (still in an appropriate range), hence the assumptions in the FSR have been conservative.
From 2005 to 2008, the actual average increasing rate of salary was 12%, 11%, 13% and 12% based on the Bureau of Labor and Social Security of Yunnan Province(IRL No.2). Therefore, the **O&M cost** is considered as also appropriate and realistic.

The **power supply** of the plant is derived from nearly 40 years statistical flow measurement data in FSR(IRL No.3). The plant is estimated to operate about 5130 hours per year. The operational hours does typically depend on the hydrological flow pattern of the river and the design of the hydropower plant. The annual power supply was calculated based on long-term flow data, which is taken from "Mujiaqiao Hydrologic Station" flow measurements (1958-1996). Moreover, the operational hours was confirmed by Lijiang Water Conservation Bureau on Feb.28th 2004(IRL No.4). TÜV SÜD deems that the operational hours of the proposed project have been estimated with reason and that no significant changes will occur in this parameter.

Industrie Service

The **applied tariff** for the IRR calculations is 0.16 RMB/kWh (with VAT), demonstrated by an approval of tariff from LiJiang Development and Reform Commission(IRL No.5). The actual price is 0.16 RMB/kWh (with VAT) from the Electricity sales invoice(IRL No.6) which exactly conforms to the FSR. Hence the applied tariff is considered by TÜV SÜD as plausible and conservative in the CDM context.

The annual interest rate was 6.12% mentioned in the FSR. The project owner signed the loan contract with Agricultural Bank of China on 25/04/2007(IRL No.7) in which the interest rate was 7.82% instead of 6.12%. Therefore, the PP chose the 6.12% as interest rate for conservative.

Both the long term flow data and the 3rd party design institute, the Yunnan Lijiang Heibaishui Group Hydropower Design Institute (its certificate was reviewed by DOE IRL No.8), are considered to be reliable sources for the power project. We would further like to stress that the FSR and respective IRR input values, comprising investment costs, O&M costs, tariff and power supply, was officially approved by Lijiang Development and Plan committee.

In summary, TÜV SÜD checked the applied values thoroughly and based on its local and sectoral expertise, TÜV SÜD confirms that these values are realistic and plausible and appear to be valid at the time the investment decision was made. Hence, criteria (c) of EB38, §54 is also fulfilled successfully.

(b):

The proposed project applies the “Economic evaluation code for small hydropower projects” (IRL No.9) issued in 1995, in which it mentions “This evaluation code is applied for small hydropower projects with installed capacity no more than 25MW (all newly-built, expansion, modification or retrofit projects). Besides, projects with a capacity of less than 50MW in rural areas can refer to this code too.”(IRL No.9)

In 2002, the Ministry of Water Resources issued a Bulletin (IRL No.10) on Effective Technical Standard in Hydro & Water Industry. Accordingly, the “Economic evaluation code for small hydropower projects” (Document No.SL16- 95) issued in 1995 was still indicated as valid at that time.

The ongoing validity of this code was further confirmed again by an official organization, i.e. Chinese Hydraulic Engineering Society, which published all valid standards for hydraulic industry on September 9th, 2006(IRL No.11).

Furthermore, TÜV SÜD can confirm, based on its local and sectoral expertise, that this benchmark is commonly used and widely applied in China for this type of project.

As a result, TÜV SÜD is confident that the 10% benchmark is appropriately applied and can be considered as suitable for the proposed project activity when construction started and restarted in 2005.

Industrie Service

The information reference list has listed all of documents which was used for the response. All documents has been verified and approved by TUV-SUD.

Ref. No.	Issuance and/or submission date(dd/mm/yyyy)	Title/Type of Document	Author/Editor/ Issuer	Additional Information (Relevance in CDM Context)
1	16/05/2008	Settlement Report of Shimenkai Hydropower Project	Lijiang Gaoyuan Public Accounting Firm	
2	2005~2008	Average increase of enterprises'wage	the Bureau of Labor and Social Security of Yunnan Province	
3	Feb.2004	Hydrological data in FSR	Yunnan Lijiang Heibaishui Group Hydropower Design Institute	
4	28/02/2004	Approval on Water Resources Demonstration Report of Shimenkai Hydropower Project	Lijiang Water Conservation Bureau	
5	28/02/2004	Notice on adjusting the bus bar-tariff of power plants in Lijang City	Lijiang DRC	
6	27/05/2008	Electricity sales invoice	Lijiang Nengda Hydropower Co., Ltd	
7	25/04/2007	Loan Contract	Agricultural Bank of China	
8	13/01/2004	Certificate	the Ministry of Construction of PRC	
9	02/06/1995	Economic Evaluation Code for Small Hydropower Projects	Ministry of Water Resource of People's Republic of China	Benchmark evidence
10	08/06/2002	Bulletin on Effective Technical Standard in Hydro & Water Industry	Ministry of Water Resource of People's Republic of China	
11	09/09/2006	Public Notice on Effective Technical Standard in Hydro & Water Industry	Ministry of Water Resource of People's Republic of China	