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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

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Request for Review

Dear Sirs,

Please find below the response to the request for review formulated for the CDM project with the **registration number 1953**. In case you have any further inquiries please let us know as we kindly assist you.

Yours sincerely,

Javier Castro
Carbon Management Service

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Response to the CDM Executive Board

Issue 1: ***The DOE is requested to clarify how it has validated the investment analysis, in particular the appropriateness of a benchmark issued 1995 when assessing the additionality of a project with investment decision made in 2005.***

Response from the project participant:

The project compares the IRR against the 10% benchmark (project IRR post-tax) as per the "The Economic Evaluation Code for Small Hydropower Projects (SL16-95)", which is applicable to hydropower stations with an installed capacity no more than 50MW. This document is part of the "Professional Standards of the People's Republic of China" and was approved and published by the Ministry of Water Resources of the People's Republic of China in 1995. [1]

Since then, no new documents prescribing benchmarks for hydropower stations with an installed capacity below 50MW have been released by the Government of China, nor has the validity of this benchmark been repudiated in any way. In fact, 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 Standards No 07 (2002)".[2] Additionally, this benchmark is still in effect in 2006.[3] The 10% benchmark is still ubiquitously applied by stakeholders of hydropower projects with an installed capacity up to 50MW (e.g. Design Institutes, Investors, governments in charge of approving projects) to evaluate the feasibility of these projects. In addition, China DNA's approval of CDM project activities with an IRR below this benchmark indicates it is still valid.

The installed capacity of the project is 25MW, therefore, the benchmark of 10% in the document SL16-95 as mentioned above is applicable to the project as SL16-95 is applicable to hydropower stations with an installed capacity no more than 50MW.

In addition, the fact that the "The Economic Evaluation Code for Small Hydropower Projects (SL16-95)" is still appropriate is confirmed and reinforced by the fact that the Preliminarily Design Report (PDR) [4] of the proposed project activity specifically mentions this on page 13-1.

For the above reasons, the 10% benchmark is the most adequate that can be and is widely applied until such time that the Chinese authorities would issue a new one for hydropower projects with an installed capacity no more than 50MW. Therefore, the project appropriately employs the benchmark of 10%.

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1 http://www.cws.net.cn/guifan/bz/SL16-95/
2 http://www.ches.com.cn/jishubiaozhun/001.htm
3 http://www.jxsly.com:6203/zy/syyw/qt/2007/slbz/1.htm, confirmed by Water Resources and Hydropower Planning and Design General Institute of the Ministry of Water Resources of the People's Republic of China
4 This same document is also called Feasibility Study Report.
5 As part of the answer to the Request for Review of project 996 - Zhoubai Hydroelectric Project.

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Response by TÜV SÜD

The benchmark which has been applied in the Preliminary Design Report (PDR) and accordingly applied in the investment analysis of the proposed project activity refers to the "Economic Evaluation Code for Small Hydropower Projects (No. SL16-95)". SL16-95 was issued by the Ministry of Water Resources of the People's Republic of China (MWR). Therefore it can be considered as an official document.
From 1995 to date this benchmark determined by the "Economic Evaluation Code for Small Hydropower Projects (No. SL16-95)" has not been revised and is still applicable. Following documents and also the internet links provided by the project participant prove that the validity of SL16-95 has been re-confirmed several times:

1) "Bulletin of Valid Hydropower Technical Standards No 07 (2002)"
2) The Water Resources and Hydropower Planning and Design General Institute of the Ministry of Water Resources of the People's Republic of China (2006)
3) The answer to the Request for Review of project 996 - Zhoubai Hydroelectric Project dated 04/06/2007[5].

The benchmark given in SL16-95 applies to hydropower installations with a capacity below 50MW. Therefore it is applicable to the proposed project activity with a capacity of 25MW as well. In addition the investment decision of this project dated in 2005 is within the period of the benchmark validity.

Further TÜV SÜD has observed that SL16-95, and hence the 10% benchmark, is still widely used in recent feasibility studies of hydropower projects in China.

Issue 2. The DOE is requested to further clarify the suitability of the input values to the investment analysis as per the requirements of EB 38, paragraph 54(c) guidance, in particular, suitability of tariff applied and the conservativeness of the net annual electricity supplied to the grid.

Response from the project participant:

According to paragraph 54 of the EB 38 report:

"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."

For the calculation of the IRR of the proposed project activity, the parameters listed in the Preliminary Design Report (PDR) [5] have been used as input values applied in the investment analysis.

[5] This same document is also called Feasibility Study Report.

The PDR was completed by: the "Zhejiang Province Lishui City Water Conservancy and Hydropower Surveying and Designing Institute". This entity is an independent organization which is qualified to compile design reports for hydropower projects (it has obtained a B grade certificate in electricity industry (hydro power) issued by the "Ministry of Construction" of the Peoples Republic of China). Additionally, the PDR has been approved by the "Development and Reform Commission of Guizhou Province" later. The PDR can be considered as an independent and realistic assessment of the proposed project activity, including the parameters listed therein which are used as input values in the investment analysis. Furthermore, the PDR was issued and available well before the start of the project activity and therefore, in accordance with the "Guidance on the Assessment of Investment Analysis" (Version 02.1), all input values were known before the investment decision/start of the project activity and can be considered as appropriate values to be used in the financial calculation of the proposed project activity.

The IRR calculation employs fixed real input values (as opposed to nominal terms [6]). The use of fixed real input values (such as grid price and O&M cost) is common practice in China and is in accordance with guidance for the preparation of feasibility studies which demonstrates that the benchmark is defined in real terms and therefore the application of fixed real input values is appropriate.[7] The IRR calculation compares the real IRR with a real benchmark which in both cases takes out the effects of general price increases due to inflation. Furthermore, we will show below that this approach (i.e. the approach of applying real fixed grid price and O&M cost) leads to a conservative IRR calculation, as it leads to a higher IRR than applying flexible and variable input values.

Finally, to confirm the appropriateness of input values applied in the investment analysis, and in particular the suitability of the grid price applied and the conservativeness of the net annual power supply to the grid, we have compared them to the actual values where possible and cross checked important input values.

- Static Total Investment:

We compare the Static Total Investment in the PDR (i.e. 141,434,300 Yuan RMB) to the actual Static Total Investment taken from the "Investment Appraisal Report" of the project activity issued by a certified accountant.[8] This comparison confirms that the estimated and assumed value in the PDR was obviously *conservative* (i.e. leading to an overestimation of the IRR) when comparing it to the actual and confirmed Static Total Investment of 221,883,200 Yuan RMB.

Static Total Investment

Source	Value
Preliminary Design Report (PDR)	141,434,300 Yuan RMB
Investment Appraisal Report (actual investment up to October 31, 2008)	221,883,200 Yuan RMB

[6] Nominal value refers to any price or value expressed in money of the day, as opposed to real value. The latter adjusts for the effect of inflation.

[7] The application of a fixed grid price for the financial calculation is appropriate in case both the input values and the benchmark are defined in real terms and when there is no expectation that the change in the nominal value of the input parameters will differ significantly from the rate of inflation.

[8] Based on the Investment Appraisal Report, published by Guiyang Tonghuiyelang Assets Appraisal Co., Ltd., the actual investment is 221,883,200 Yuan RMB up to October 31, 2008. But the project construction is not yet completed (expected to be completed in the end of 2008), and therefore the actual investment will be higher than the figure from the Investment Appraisal Report.

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-Operations and Maintenance Cost (O&M Cost)

The project activity is expected to be fully operational in the end of 2008. [9]

The O&M cost is calculated according to the data from the approved PDR. Based on the PDR, The Interim Regulations of Hydropower Construction Project Financial Evaluation and hydropower No [1995]186 documents, O&M cost mainly include payroll, overhaul cost, welfare fund, material cost, insurance for fixed assets, water charges and other cost. The parameters using to calculate the O&M costs of the project have been analyzed respectively:

- Based on the above SL16-95 evaluation code, regarding to a hydropower project with an installed capacity greater than 6MW, the minimum employees should be 48 persons, while based on the PDR, the IRR calculation of the PDD uses 30 persons, which is conservative.
- Based on the above SL16-95 evaluation code, the average rate of overhaul cost is 1%, which is fixed and consistent with the IRR calculation of the PDD;
- Based on the above SL16-95 evaluation code, the range of other cost is 12-15Yuan RMB/kW, which is fixed and consistent with the value of 12 Yuan RMB/kW in the IRR calculation of the PDD;
- Based on the above SL16-95 evaluation code, 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 Inform of Water Charge in Guizhou Province published by local government, the actual water charge of hydropower projects is 0.004-0.007 Yuan RMB/kWh, which is higher than the designed vaule of 0.001 Yuan RMB/kWh in the IRR calculation of the PDD. Therefore the designed value in IRR calculation is more conservative.
- Based on The Interim Regulations of Hydropower Construction Project Financial Evaluation, the material cost is 5 Yuan RMB/kW, which is fixed and consistent with the value in the IRR calculation of the PDD;
- Based on the IRR calculation, the total insurance for fixed assets is 0.25% of the fixed assets annually. According to the Contract of Insurance for Fixed Assets of the project, the actual insurance is 0.35% of the fixed assets annually, which is higher than the designed value in the IRR calculation of the PDD. Therefore the designed value in IRR calculation is more conservative.
- Based on the PDR, the IRR calculation uses 8,000 Yuan RMB/Person annually. But according to the payroll record of employees of the Guizhou Huiming Electronics Taijiang Co., Ltd., the actual average payroll of the employees is 33,000 Yuan RMB/Person annually, which is higher than the payroll in PDR.

Therefore, most data of O&M Cost are fixed and comparatively stable, but only the salary of the employees, the water charges and the insurance for fixed assets have been increased. Thus, obviously, the actual annual O&M Costs will be increased than the estimated value in IRR calculation.

In addition, the unitary operational cost 0.027 Yuan/kWh (O&M Cost of 2,726,500 Yuan RMB/ Annual Power Generation of 100,010,000kWh, as listed in PDD) of the project has been confirmed to be a reasonable and conservative value according to the range 0.04-0.09 Yuan/kWh[10].

[9] The operation starting date is delayed due to bad geological conditions.

[10] Published by a local consulting (Beijing Hualing Sifang Investment Consultant Company) as the reference for this parameter as evidenced with an article issued on 2006 and published on Chinese research website on industrial projects (http://www.badassets.com)

Furthermore, to ensure a conservative approach we will analyse recent development of salaries in Guizhou Province and compare this to inflation over the same period. During the period 2000 - 2006, salaries in Guizhou increased annually on average with 13.26%.[11] At the same time the annual rate of inflation in Guizhou was 1.17%[12] during the period 2000-2006. Therefore the real salary rate (corrected for inflation) increased substantially during this period. Considering that salaries take up a significant part of the O&M cost, this means that the assumption of fixed real O&M cost can be considered a *conservative* assumption in the context of the rapidly increasing salaries in China in general and Guizhou Province in particular.

Therefore, the actual annual O&M Costs used in PDD is credible and conservative.

-Grid price:

The fixed grid price of 0.215 RMB/kWh (excluding VAT) used as input value for the financial calculation of the project activity is taken from the PDR.

The project activity is expected to be fully operational in the end of 2008. At present, the Guizhou Province Price Bureau approved an actual grid price for the project, and the fixed actual grid price of the project is 0.2184 Yuan RMB/kWh[13] (including VAT, and corresponding to 0.1867 Yuan RMB/kWh (excluding VAT)), which is much lower than the estimated price of 0.215 Yuan RMB/kWh (excluding VAT) in PDR. This comparison confirms that the estimated and assumed value in the PDR was *conservative* (i.e. leading to an overestimation of the IRR) when comparing it to the actual and confirmed grid price of 0.1867 Yuan RMB/kWh (excluding VAT).

For the IRR calculation the grid price has been assumed a fixed real input value (see also explanation above in the introduction why this is appropriate). An analysis of the actual development of the grid price over time is hampered by the fact that the power sector in China has undergone several regulatory changes and consistent grid price data over a longer period is not available. It is however expected that the grid price will be adjusted in the future to correct for inflation and therefore the assumption that the grid price will develop proportionally to the rate of inflation (as done in the IRR calculation assuming fixed real input values) can be considered reasonable. However, as any of such corrections for inflation would lag behind actual inflation, assuming that grid prices will be corrected for inflation instantaneously, as is done in our analysis (i.e. assuming a fixed flat grid price in accordance with the definition of the benchmark), implies that actual real revenues from the sale of power are somewhat overstated and the IRR calculation likely leads to a conservative interpretation of the additionality requirements.

-The net annual electricity supplied to the grid:

The project activity is expected to be fully operational in the end of 2008, and it is therefore not feasible to compare the estimated annual net power supply from the PDR (i.e. 90,750MWh) to actual net power supply during the first year of operations.

We do however confirm the estimated value of designed power generation in the PDR, which is used as input value for the IRR calculation, is calculated on a strong water resource statistical

11 China Statics Year Book 2001-2006 (http://www.stats.gov.cn/tjsj/ndsj/)
12 China Statics Year Book 2001-2006 (http://www.stats.gov.cn/tjsj/ndsj/)
13 The Circular from Guizhou Province Price Bureau on the Grid Price of the project

basis, namely on 42 years of water flow measurements (1960-2001) by the "Nanhua Hydrological Station". Therefore, a significant change in average annual power generation of the project during the crediting period is not likely to occur. In addition, during "rainy seasons", the grid company might not off-take all electricity generated by the project activity due to an oversupply of electricity (this is agreed upon in the Power Connection Agreement). Therefore, a significant increase in average annual power generation of the project during the crediting period is not likely to occur.

As described in PDD requesting registration, the average annual operating hours is 4,000 hours, the average annual designed electricity generation is 100,010MWh, and the net annual power supply to the grid is estimated to be 90,750MWh. The net power supply to the grid of 90,750MWh is calculated based on coefficient of effective electricity (0.95), line losses (4%)[14] and auxiliary power consumption (0.5%):

$$90{,}750\text{MWh} = 100{,}010\text{MWh} \times 0.95 \times (1-0.5\%) \times (1-4\%)$$ [15]

The calculation formula comes from PDR which in turn bases its calculation on the *"*the Economic Evaluation Code for Small Hydropower Projects (SL16-95)*"* (same guidance used by the design institute preparing the PDR). Therefore, the net power supply to the grid employed in the IRR calculation is reasonable.

- The coefficient of effective electricity of 95% comes from approved PDR and is further confirmed by the Hydroenergy Design Code for Hydro Power Projects (SL76-94) approved by the Ministry of Water Resources of the People's Republic of China: [16]
  - For small scale hydropower stations (with an installed capacity below 50MW), the coefficient of effective electricity and effective power generation should be calculated according to the Economic Evaluation Regulation for Small Scale Hydropower Projects (SL16-92), which was substituted by *"*the Economic Evaluation Code for Small Hydropower Projects (SL16-95)*"*, whose in Table 3.4 provides an overview of applicable coefficients for energy efficiency as follows:

The coefficient of effective electricity for different type of hydropower stations:

Type of hydropower stations	The coefficient of effective electricity
1.Grid connected, annual/ multi-year regulating hydropower stations	0.95-1.00
2.Grid connected, seasonal regulating hydropower stations	**0.90-0.95**
3. Grid connected, monthly/weekly/daily regulating hydropower stations	
The grid will take all electricity generated in rainy season and night	0.80-0.90
The grid will only take part of the electricity generated in rainy season and night	0.70-0.80
4. Not connected to the grid, Daily/No regulating capacity	0.60-0.70

14 Including on-site transformer and line losses

15 In Section 3.2.1, 3.2.2, and 3.4 of the SL 16-95 regulation it is stated that the power supply to the grid by a project is calculated as the annual designed electricity generation × coefficient of effective electricity × (1 – auxiliary power consumption) × (1 – the line losses). The annual designed electricity generation × coefficient of effective electricity is the effective electricity generation (which is based on amongst others the load factor, the electricity balance of the local grid, and the frequency of equipments overhaul and damages. Section 3.4 of SL 16-95 further specifically states that for simplification purpose, the coefficient of effective electricity can be chosen from the table 3.4 in the SL 16-95 document.

16 Please see: http://www.chinawater.net.cn/guifan/bz_pdf/SL76-94/05.pdf

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- ✧ The installed capacity of the project is 25MW and the project is a seasonal regulating hydropower station. In accordance with the Table 3.4 in "the Economic Evaluation Code for Small Hydropower Projects (SL16-95)" as listed above, the coefficient of effective electricity should choose 0.90-0.95. The Design Institute has chosen to employ the highest value of 95% as the coefficient of electricity generation. This is a ***conservative*** choice as a higher coefficient leads to higher power supply and therefore an overestimation of the IRR compared to employing a lower values as coefficient of electricity generation.
- ✧ In addition, the coefficient of effective electricity is the result of the balance between the local grid absorption capability in the dry and rainy seasons, taking into consideration the demand for power in the two periods. In particular has been evidenced the coefficient of effective electricity reflects the conditions of insufficient water availability during the dry season (October to May of each year) and the condition of "over the grid capability" available power during the flood season (from June to September of each year). The result is a production which changes significantly throughout the year and in particular between the dry and the flood season, therefore affecting the annual electricity which will feed the grid. The potential power production which has been estimated in PDR according to the hydrological conditions in terms of water availability, does therefore differ from the actual power which will be produced, because full load conditions will be rarely set during the plant operation throughout the year due to the lack of adsorption capability of the grid. In other words, during the flood season, a considerable hydropower potential, which in theory could allow the plant to reach 100% of the expected production, will be partially wasted due to the evidenced limits in the grid transmission and distribution system[17].

  Therefore the coefficient of effective electricity of 95% is reasonable and conservative.

- ➢ The line losses of 4% have been determined by the independent and certified Design Institute preparing the PDR based on its professional experience. Additionally, the average line losses of Guizhou Province are 5.17%[18], which is higher than the value of 4% in the PDR. The Design Institute has chosen to employ the lower value of 4% as the line losses. This is a ***conservative*** choice as a lower line losses leads to higher power supply and therefore an overestimation of the IRR compared to employing a higher values as line losses.
- ➢ The 0.5% for auxiliary power consumption is based on the "Economic Evaluation Code for Small Hydropower Projects (SL16-95)". According to this guidance, auxiliary power consumption is to be determined based on the actual situation or referred to from other similar projects. Based on "the regulation of development programming of electrical power in the

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[17] Explanation for the coefficient of effective electricity, published by local grid company. In this document, local Grid Company (which the project connected) issued an explanation and the reasons to prove the validity of the coefficient of effective electricity of 85%-95%. The main reasons are as following:

- ✧ Comparing with the construction of hydropower stations, the construction of power grid in Guizhou Southeast Autonomous Prefecture (where the project is located) is lagging behind and it is beyond the capability of the power grid.
- ✧ The structure of the local grid is frail and the transmission load capacity is limited, so the bottleneck on transmission is rather common
- ✧ Due to low absorption ability and the lower load of local grid, there is large amount of the surplus of electricity during the rainy season and the grid company is not able to buy all of the power that could potentially be generated by the plants, so that this surplus electricity could not be utilized efficiently.
- ✧ Therefore, the coefficient of effective electricity of 85%-95% is reasonable. The coefficient of effective electricity of 95% was employed by the project, it is conservative.

[18] China Electric Power Yearbook 2006

region mainly supplied by rural hydropower (SL22-92)"[19], auxiliary power consumption has been determined as 0.5% by the independent design institute preparing the PDR. This is reasonable and in accordance with the public guidance.

It can be concluded that the net annual power supply to the grid used in the IRR calculation is reasonable and conservative at the time of investment decision.

To conclude, the estimated power generation is calculated on a strong and long-term (1960-2001) water resources statistical basis combined with official and public guidance on calculation of effective power generation (including employing a conservative value of 95% for effective electricity generation instead of 90%). Additionally, estimated net power supply to the grid is also calculated based on conservative and reasonable guidance on line losses and auxiliary power consumption, but could be conservative (i.e. overestimated) due to the fact that the grid company might not actually off-take all generated electricity during rainy periods with a high water flow. Therefore, the estimated annual net power supply from the PDR, which is used as input value in the IRR calculation, is a *conservative* estimation.

Conclusion

It can be concluded that the input values are taken from a credible data source (i.e. the PDR) which was issued by a certified design institute and approved by the government. The PDR was issued before the start of the project activity and the investment decision and was therefore applicable at the time of the investment decisions.

Furthermore, we have compared the input values to actual values were possible and can conclude that the input values overall have been a conservative interpretation of the additionality requirements (i.e. leading to a systematic overestimation of the IRR).

In particular,

- ✧ The actual grid price obtained by the project activity is lower than the assumed grid price in the PDR which is taken as input value for the IRR calculation. As the ex-ante assumed grid price which is used as input value for the IRR calculation is higher than the actual power price we can conclude that the assumption was ***conservative*** (i.e. leading to an overestimation of the IRR).
- ✧ The net power supply to the grid is calculated based on the power generation (which is calculated on a strong and long-term (1960-2001) statistical basis of water resource measurements by the government), the most ***conservative*** coefficient of effective electricity of 0.95 (instead of 0.9), reasonable line losses of 4%, and formal public guidance on auxiliary power consumption (i.e. 0.5%). Additionally, the estimated net power supply could further be ***conservative*** (i.e. overestimated) due to the fact that the grid company might not actually off-take all generated electricity during rainy periods with a high water flow. Therefore, the estimated annual net power supply to the grid from the PDR, which is used as input value in the IRR calculation, is a conservative estimation.

It can be concluded that the input values used in the financial calculation, and in particular the grid price and net power supply to the grid, are valid and applicable at the time of the investment decision.

[19] Published by the Ministry of Water Resources of the People's Republic of China

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Response by TÜV SÜD

The input values applied in the PDR (also could be called Feasibility Study Report, FSR) and used for the investment analysis are based on the "Economic Evaluation Code for Small Hydropower Projects (No. SL16-95)" issued by the MWR. This documents listed in Annex 2 (Information Reference List) of the Validation Report has been verified by TÜV SÜD's assessment team on-site as well as via desk review. The SL16-95 Code was in force without restriction and the input parameters were consistently derived from the PDR. Hence TÜV SÜD can confirm that the applied input data are appropriate and valid at the time of preparing the investment analysis of the project activity.
In addition TÜV SÜD performed a thorough evaluation and review of the values of the input data applied for the project's investment analysis. As part of this evaluation the credibility and plausibility of these 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 has been checked. Furthermore a cross-check of the values applied was possible with actual contacts and additional documentation.

To confirm and verify the appropriateness and validity of the input values used for the performance of the investment analysis, the assessment team of TÜV SÜD has reviewed each relevant figure which essentially could affect these financial calculations as the following:

Total Static Investment:

The investment costs were calculated by the Total Static Investment of 141,434,300 Yuan RMB. This leads to a ratio investment/capacity of 5.65 Mio/MW which has been considered reasonable according to the experience reached by the assessment team in China on hydropower stations projects validation and assessment.
Further the Investment Appraisal Report dated November 18, 2008 states that actual costs incurred have exceeded the PDR estimate of November 2005. It shows that the Total Static Investment has increased approx. 55% to 221,883,300 Yuan RMB which actually demonstrates the conservativeness of the financial analysis approach. The reasonability and conservativeness of the value used for the Total Static Investment in the PDD receives confirmation compared with the costs which have been currently undertaken by the project up to date.

Operation & Maintenance (O & M) Costs

During the assessment it has been confirmed that the calculation parameters match with the local policies and regulations (in terms of overhaul costs, material cost, water charge, etc.) and with the situation as evidenced on-site audit. The annual O & M Costs of 2,726,500 Yuan RMB have been considered as acceptable.
Furthermore the O & M Costs calculated lead to a ratio Annual O&M costs/Static Total Investment which results in about 1.9% which is considered as reasonable and conservative value, according to previous experiences on similar scale plants.
Discussing some individual assets of the project's O & M Costs e.g.,

- The Interim Regulations of Hydropower Construction Project Financial Evaluation document estimates 5 Yuan/KW material costs. This is still consistent with the applied value in the IRR calculation.
- The payroll record of employees of the Guizhou Huiming Electronics Taijiang Co., Ltd (the project owner) dated November 2008 calculates 44,000 Yuan RMB distributed to 16 employees. That means approximately 2,750 Yuan RMB/person and year. In com-

parison the payroll estimate of 24,00 Yuan RMB and 30 employees taken as basis in the IRR calculations has worked out annually 800 Yuan /person which could be considered as a much more conservative approach.
- As currently contractual agreed and documented the insurance costs amounts 0.35% of the fixed assets. In the financial calculations of the project 0.25% has been specified which is significantly less and more conservative.
- The Inform of Water Charge in Guizhou Province document dated February, 2007 determines 0.004-0.007 Yuan RMB/kWh. This range is obviously higher than estimated in the more conservative IRR calculations.

and looking at

- the operational costs (O & M Costs/Annual Power Generation: 0,03 Yuan/kWh) of the project activity can be considered as very conservative compared with the documented range of 0.04 – 0.09 Yuan/kWh per year.

Following the material costs, the current costs undertaken by the project owner in terms of personnel payroll, the insurance costs, the water charge and the unitary operational costs have been evidenced. As demonstrated TÜV SÜD confirms that according to theses confirmations the annual O & M Costs as stated in the PDD have been estimated based on the calculations on provable parameters and reliable assumptions and that the value of O & M Costs obtained is even conservative compared with the amount mentioned in the PDR.

Grid Price

The applied tariff of 0.215 RMB/kWh (excl. VAT) used for the IRR calculations of the project activity is taken from the PDR. It was assumed according to the most reliable information available at that time. Meanwhile according to relevant regulations from the Circular of Grid Price for Approved New Power Plants issued by State Planning Commission and the Circular of the Implementation of Coal and Electricity Price Cooperative Mechanism in Southern China Grid issued by the National Development and Reform Commission the Guizhou Province Price Bureau has negotiated and set the tariff as 0.2184 Yuan RMB/kWh, including VAT (0.18667 Yuan RMB/kWh excl. VAT) which is significantly less and fixed through the whole operating period. Applying the value of 0.18667 Yuan RMB/kWh in the IRR calculations which are additionally available it can be demonstrated both the effect of a fixed real input value and the effect of a tariff increase as well as the conservativeness of the former approach. The current tariff fixed leads to an IRR without CER of 7.40%. Also the former tariff of 0.215 Yuan MB/kWh haven't reached the benchmark of 10% calculated an IRR without CER of 8.76%. TÜV SÜD is confident that the additional proofs provide reliability of the assessment and of the assumption done using such a value for the electricity tariff.

The net annual electricity supplied to the grid

A value of 4,000 hours has been assumed in the PDD according to the value as reported in the PDR which relies on a strong hydrological study taken into account data from 1960 to 2001. The value of the annual utilization hours has been compared to the average value obtained by the analysis of more than 250 hydro power projects currently under validation. According to this DOE's internal statistics, the average annual utilization hours is 3,871, confirming that the proposed project estimated a reasonable and conservative value, this is also correct when the 4% line losses and 0.5% plant consumption are included in the calculation. Furthermore, the genesis of this value has been evaluated by the DOE: the hydraulic regime of the Bala River has been studied by the institute in charge to prepare the PDR considering

a consistent amount of historical flow data and water availability, between 1960 and 2001. The validation team has verified the section of the Preliminary Design Report (dated November/December 2005) where the hydrological assessment is presented. The strong hydrological basis behind the study allows to state that the annual utilization hours have been consistently estimated and that no significant changes will occur in this operational parameter. The figure of the annual utilization hours has been furthermore compared with the value observed in many other large scale hydropower plants in China and it's confirmed as a reasonable and conservative value. The data assumed in PDR and in PDD has been therefore considered acceptable and consistent with the specification of the project as evidenced during both the on-site audit and the subsequent additional review.