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Request for Review

Dear Sirs,

Please find below the response to the review formulated for the CDM project with the title "*Guangxi Zhuang Autonomous Region Nandan Naba 1st Level Hydropower Station*" with the registration number 1776. 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 they have validated that the use of fixed input values (tariffs and O&M cost) in the IRR calculation is appropriate in the context of the project activity

Response from the Project Participant

All parameters used to calculate the IRR of the project are from the Preliminary Design Report (PDR) or Preliminary Design Report Budgetary Estimate Report (PDR-BER). Except static total investment from PDR-BER, other all parameters are from PDR. The PDR and PDR-BER were completed by the "Guangxi Liuzhou Hydropower Reconnaissance Institution", This entity is an independent organization which is qualified to compile design reports for hydropower projects (it has obtained A grade in water conservancy industry, electricity industry (hydro power) and a B grade in engineering investigation industry (engineering survey), both issued by the Construction Bureau of Guangxi Province). In addition, both of the reports mentioned above have been approved by local DRC. Therefore, the input values in the IRR calculation are appropriate, credible and reliable.

Grid Price (Tariffs)

The grid price of the project is 0.26 Yuan/kWh without VAT in the approved PDR (also used in the PDD). And, the actual grid price of the project is 0.2453 Yuan RMB/kWh without VAT (0.26Yuan RMB/kWh with VAT^[1]), which was approved by the Guangxi Province Government. This actual grid price is lower than the one in PDR. Therefore, the grid price (0.26 Yuan/kWh without VAT) used for IRR calculation of the project is more conservative and credible. And this actual grid price of 0.26 Yuan RMB/kWh is not changed from the day the documentation issued till now. In addition, according to the No [1995]186 documents: Revision of Economic Evaluation Code for Small Hydropower Project (SL16-95), the price should use the fixed current price in the financial assessment. Therefore, the fixed grid price of 0.26 Yuan/kWh without VAT is reasonable.

O&M Cost

The O&M costs are calculated according to the parameters from the approved PDR. In order to further demonstrate the fixed input value of O&M cost is appropriate, the fluctuation of O&M costs has been considered. Based on the PDR and hydropower No [1995]186 documents: Revision of Economic Evaluation Code for Small Hydropower Project (SL16-95)^[2], O&M costs mainly include payroll, welfare fund, water charges, overhaul cost and other cost. The parameters using to calculate the O&M costs of the project have been analyzed respectively:

[¹] Inform of Guangxi Grid Price issued by Guangxi Province Price Bureau in 2004.

[²] Hydropower No [1995]186 documents: Revision of Economic Evaluation Code for Small Hydropower Project (SL16-95) released by the Ministry of Water Resources of the People's Republic of China. According to the hydropower No [2002]07 documents, Currently Effective Hydrotechnics Standards Announcement, by the Ministry of Water Resources of the People's Republic of China, the hydropower No [1995]186 document is still effective and enforceable.

- 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, but based on the PDR, the IRR calculation of the PDD uses 32 persons, which is a fixed value for the project and more conservative;
- Based on the above SL16-95 evaluation code, the welfare fund for employees should be 14% of the total wage, which is fixed value and consistent with the IRR calculation of the PDD;
- Based on the above SL16-95 evaluation code, 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 SL16-95 evaluation code, the average value of other cost is 12 Yuan/kW , which is fixed value and consistent with the IRR calculation of the PDD;
- According to Inform of Water Charge in Guangxi Province published by local government, the water charge of small scale hydropower station in Guangxi Province should be 0.001 Yuan RMB/kWh, which is also fixed value and consistent with the IRR calculation.
- Based on the PDR, the IRR calculation uses 12,000 Yuan RMB/Person annually. But according to the payroll record of employees of Nandan Hongyuan Hydropower Exploitation Co., Ltd., the actual average payroll of the employees is 20,082 Yuan RMB/Person annually, which is higher than the payroll in PDR.

Therefore, most parameters of O&M Cost are fixed, and only the salary of the employees may be fluctuated. See the detailed discussion below.

Fluctuation of salary (O&M Cost):

In order to demonstrate the fixed input value of salary is appropriate, the statistical fluctuation of salary (O&M costs) has been considered.

Table Various Price Indexes Fluctuations (Last Year=100)

Item	2002	2003	2004	2005	2006	Average
Salary	110.3	108.2	109.7	111.7	113.3	10.64%

Information source: China Statics Year Book 2003-2007 (<http://www.stats.gov.cn/tjsj/ndsj/>)

For O&M cost, the average increasing rates of salary is 10.64% from 2002 to 2006 (Guangxi Province average salary Sector).

It can be found that the salary indexes of O&M costs would increase during the last five years. If we assumed that the O&M costs increase 10.64% in the operating period, the IRR will be only 5.09%, which is lower than the benchmark of 10%.

All the above data come from public official website of local government. (China Statics Year Book 2003-2007).

Due to conservativeness principle, the use of fixed input values (Tariffs and O&M costs) in the IRR calculations is appropriate.

Response by TÜV SÜD

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 lead to this conclusion, demonstrated here for case 1776.

The main reason is:

- The project **applies the benchmark SL-16-95, Economic Evaluation Code for Small Hydropower Projects, P.R.China Industry Standard, standard no. SL16-1995 (IRL10)**, as attached to the request for review response as enclosure 2. According to this document, it can be clearly seen 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 reports of 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.

Further reasons are:

- The Chinese electricity market was liberated in 2002. Since then, the electricity tariff, which is still regulated by the national authorities, has been constant in Guangxi province (0.26 Yuan/kWh). This could be demonstrated by the tariff notice Certificate of the electricity price, July, 2nd, 2004, Price Bureau Guangxi Zhuang Autonomous Region, No.(2004)222. The price of the proposed project is 0.260 Yuan/kWh (IRL14, as attached as enclosure 1 to this response). TÜV SÜD has reviewed additional evidence which indicated that this tariff was already applied in 2002 (IRL38) and was still valid in 2008 (IRL39). It is thus concluded that there is no indicator to consider a change in the grid tariff in the financial assessment.
- On the other hand, there are a number of indicators suggesting that O&M costs are rising as time goes by. Considering those rising O&M costs appears to be not relevant in CDM context, as it can be considered a conservative approach to apply a constant O&M cost. Referring the wage index of Guangxi province, the *China Statics Year Books 2003-2007* reveal an average increase of in salaries of 10.64%. All other assumptions made to calculate the O&M costs, are consistently applying the guidance of the benchmark document. In certain aspects, the project uses conservative approaches, e.g. less people are assumed to work at the plant (as compared to the SL-16-95), and wages are in reality about 60% higher than estimated (IRL42).
For demonstration only, the PPs have presented a revised IRR calculation incorporating the increasing salary costs (IRR 5.09%).
- The financial analysis applies a sensitivity analysis, varying among other parameters the tariff and O&M costs +/-10%. The result reveals a maximum IRR of 9.22%, assuming a 10% increase in grid price throughout the entire 20 years period of consideration. The benchmark will only be crossed assuming a 16% higher tariff throughout the 20 years. Considering the O&M costs, the impact of sensitivity is much lower; assuming a 10% decrease of the O&M costs, IRR reaches 8.07%; even assuming zero O&M costs, the

IRR will be only reach 9.69%, which is below the benchmark threshold of 10%.

To conclude, TÜV SÜD likes to stress that it considers unnecessary to investigate the above for each hydropower project requesting registration at the UNFCCC. The applied benchmark assessing the projects financial viability clearly suggests applying fixed values for the calculation. Further, as current trends show, the revenues, depending on the tariff, are likely to stay constant, while at the same time the O&M costs are likely to increase significantly – a trend which leads to the conclusion that currently applied calculation methods applying fixed parameters can be considered a conservative approach in the CDM context.

This conclusion is valid for all other TÜV SÜD positively validated Chinese hydropower projects applying the investment analysis to proof additionality and referring to one of the following benchmark documents:

- a. Economic Evaluation Code for Small Hydropower Projects, P.R.China Industry Standard, standard no. SL16-1995
- b. Economic Assessment method and Parameters for Construction Project, the third edition (2006) (*"A fixed price should be used in the operation period"*)
- c. The Economical Assessment Temporary Regulation on Electrical Technology Improvement Project, published by China Electric Power Press. September 10, 2002 (*"The price should be based on the current price system in the financial evaluation"*)

Enclosures:

- Enclosure 1 – Footnote 1 – Inform of Guangxi Grid Price issued by Guangxi Province Price Bureau in 2004 (IRL14)
- Enclosure 2 – Footnote 2 – Economic Evaluation Code for Small Hydropower Projects, P.R.China Industry Standard, standard no. SL16-1995 (IRL10)