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	IS-CMS-MUC/ Cuiyun Zhang	089 5791-3038 Rachel.Zhang@tuev-sued.de	089 5791-2756	20. November 2008	1 von 9

Response to Request for Review

Dear Sirs,

Please find below the response to the request for review formulated for the CDM project with the registration number 1872. In case you have any further inquiries please let us know as we kindly assist you.

Yours sincerely,

Cuiyun Zhang
Carbon Management Service

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Response to the CDM Executive Board

Issue 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 guidance of EB 38 paragraph 54(c).

Response by the Project Participants:

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."*

As indicated in PDD, the project owner made CDM application decision in January 2005 and started the project activity in March 2005 (the equipment purchase agreement was signed, which was the earliest starting date of the project activity). At that time, the Feasibility Study Report (FSR) was the basic reference for decision. The FSR was finished in March 2004 by the independent and certified "National Water Department Hunan Investigation Design & Research Institute of Water Resources and Hydropower"[1] and subsequently approved later by local government (i.e. the "Hunan Development and Reform Committee"). The project IRR post tax in FSR is lower than the benchmark of 8%. Therefore the project owner decided that CDM was required to implement the project.

In November 2005, the Preliminary Design Report (PDR, further design of FSR) was finished by the same design institute and approved by local government. The installed capacity (from 195 MW to 200 MW) and some other relevant parameters were improved for full use of water resources, therefore, the parameters used for IRR calculation in PDR accord with the actual situation further, and the IRR in PDR is higher than FSR and still below the benchmark , and both lead to the same conclusion, i.e. that the proposed project activity would not be financially attractive without revenues through the sale of CER revenues.
The following Table 1 provides the input values used for estimating the project IRR from the FSR and PDR:

Table 1 the input values used for investment analysis from the FSR and PDR

Parameters	Value from the FSR	Value from the PDR
Installed capacity (MW)	195	200
Annual Power supplied to Grid (MWh)	722,620	750,760

1 This design institute has obtained a "grade A" in water conservancy industry and hydropower project design industry, and a "grade A" in engineering investigation industry, both issued by the Construction Bureau of Peoples' Republic of China.

Total Investment [2](Mio Yuan RMB)	1,699.9913	1,718.2635
Estimated Grid Price (RMB/kWh, including VAT)	0.308	0.308
VAT(%)	17	17
Surcharge Tax (%)	8	8
Income Tax (%)	33	33
Operational Period (years)	30	30
Annual Operational Costs (Mio Yuan RMB)	29.359	27.34
IRR (%)	6.78	7.12[3]

Therefore, the parameters listed in PDR have been used as input values applied in the investment analysis of PDD in order to indicate the actual situation (installed capacity, investment and etc), and it is also more conservative.
As the FSR and subsequent PDR have been completed and issued by an independent and certified design institute and approved by the local provincial government, we consider the FSR and subsequent PDR independent and realistic assessments of the proposed project activity. We have opted to use the data listed in the PDR as input values for the financial calculation in the PDD as this document is the most recent available document, but can confirm that a calculation based on the earlier issued FSR leads to the same conclusion, i.e. that the proposed project activity is not financially feasible without the revenues through the sale of CERs.

The PDR has numbers concordant with numbers available at the time when the project just started, and also includes the project adjustment (from 195 MW to 200 MW). Despite being more accurate, the PDR is also more conservative from a CDM additionality assessment perspective because of the higher IRR.
In order to prove the conservative of the input values based on the PDR, the important input values from PDR can be cross checked using the actual data available now since three units have been in commission.

Table 2 the Designed Data in PDR and Actual Values

	Value in PDR	Actual Value	Comment
Annual utilization hours	4,032h (the annual utilization hours of 4,032 in PDR is calculated based on water resource data of 50 years (1951-2000), so dramatically change of electricity generation of the project in the whole crediting period will rarely happen)	4,000h is expected in 2009 (see detailed in the following comment)	All units of the project will be in operation in early 2009, the estimated power generation of the project in 2009 will be 800,000MWh[4], corresponding to annual utilization hours of 4,000h. Therefore, The figure 4,032h used in IRR calculation is more conservative.
Grid Price	0.308 Yuan RMB/kWh with VAT	0.308 Yuan RMB/kWh with VAT[5,6]	The price from PDR used in IRR calculation is credible.

2 Excluding transmission project investment, as mentioned in PDD, the total static investment used in PDD is the sum investment of power plant and electricity transmission line and transformer substation, however, the IRR calculated in PDR and FSR just considered the investment of power plant. Actually, the project owner will invest the investment of electricity transmission line and transformer substation according to agreement with the Grid Company (based on the transmission agreement with Grid Company, April 2005). Therefore, the sum investment is used to calculate the IRR in PDD, which is reasonable.

3 Based on the footnote 2 above, the IRR in PDD is 6.84%.

4 The statement of grid company, and the operation plan 2009 of Dafutan station

5 The Power Purchasing Agreement of 2008 and the statement of grid company

6 Employing a flat and fixed power tariff for the calculation of the IRR is reasonable as the power tariff is not expected to increase more than inflation during the project lifetime. In the Power Purchasing Agreement of 2008 and the statement of Grid Company, the actual fixed grid price of the project is 0.308 Yuan RMB/kWh (confirmed later by the by the electricity invoices) during the whole operation period. For all subsequent years the grid price of 0.308 Yuan RMB/kWh will most likely to be fixed. In China, the grid price is strictly regulated by China government and it is established on strict regulation rather than the market

Static Total investment	1,778.2635 (Mio Yuan RMB, including investment of electricity transmission line and transformer substation)	The actual investment until October 2008 is about 1,795.10 (Mio Yuan RMB) [7]	The actual investment until October 2008 is higher than the deigned investment in PDR, and lower total investment of 1,778.2635 Mio Yuan RMB from PDR used in IRR calculation is more conservative.
Annual O&M costs	27.9668 (Mio Yuan RMB)	28.41788 (Mio Yuan RMB)	The annual O&M cost from PDR used in IRR calculation of PDD is more conservative, and the detail information will be explained below.

Annual O&M Costs

The O&M costs are calculated according to the data from the approved PDR. It can be further demonstrated that the input value of O&M cost is appropriate through cross-check. Based on the PDR and The Interim Regulations of Hydropower Construction Project Financial Evaluation (The PDR was completed by the institute based on The Interim Regulations of Hydropower Construction Project Financial Evaluation), O&M costs mainly include payroll, overhaul cost, welfare fund, employee's insurance, housing provident fund, water charges, reservoir maintenance fund and other cost. The parameters using to calculate the O&M costs of the project have been analyzed respectively:

- based on the statement of the project owner, the employees should be 60 persons8 after operation of whole project, which is fixed and consistent with the IRR calculation of the PDD;
- based on The Interim Regulations of Hydropower Construction Project Financial Evaluation, the average rate of overhaul cost is 1%, which is fixed and consistent with the IRR calculation of the PDD;
- based on The Interim Regulations of Hydropower Construction Project Financial Evaluation, the material cost and other cost is 5 Yuan RMB/kW and 24Yuan RMB/kW respectively, which is fixed and consistent with the value in the IRR calculation of the PDD;
- based on The Interim Regulations of Hydropower Construction Project Financial Evaluation, 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 of 20% 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 6% in the IRR calculation of the PDD.
- according to The Interim Regulations of Hydropower Construction Project Financial Evaluation, the reservoir maintenance fund of hydropower station should be 0.001Yuan RMB/kWh, which is also fixed and consistent with the IRR calculation.
- according to The Standard of Water Charge of Hunan Province, the water charge of hydropower station should be 0.001Yuan RMB/kWh, which is also fixed and consistent with the IRR calculation.

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.

7 Based on the financial balance sheet of project owner of October 2008, the actual investment is 1.7951 billion Yuan RMB till October 2008. But the project is not completed till early 2009, and therefore the actual investment will be higher.

8 The statement of payroll of Dafutan station

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- based on the PDR, the payroll was 12,000 Yuan RMB/Person annually. But according to the payroll record of employees of the Hunan Chenxi Dafutan Hydropower Co., Ltd., the actual average payroll of the employees is 19,518 Yuan RMB/Person annually, which is higher than the payroll in PDR.

Therefore, most data of O&M Costs are fixed and comparatively stable, but only the salary of the employees has been increased from 12,000 Yuan RMB/Person annually in PDR to 19,518 Yuan RMB/Person annually. Thus the actual annual O&M Costs will be increased from 27.9668 Mio Yuan RMB to 28.41788 Mio Yuan RMB. Thus, the actual O&M Cost is higher than the designed value in PDR.
Therefore, based on the above cross-check, the important input values used in the financial analysis is more conservative than the actual values.
In conclusion, the input values from the PDR employed in the investment analysis, which are more conservative than FSR, are valid and applicable in consistent with the EB 38 guidance, paragraph 54(c).
Response by TÜV SÜD:
The applicability of the input values at the time of the decision to invest in the project (i) and, then, the validity of the values applied to perform the investment analysis (ii), have been considered and further investigated by the DOE. In order to clarify these important aspects, Table 3 summarizes as reference the timeline of the key-events as evidenced by the assessment done during the validation and as confirmed with this additional assessment:

Table 3: Timeline of the key-events and relevance in the CDM context

Date	Key event	Evidence	Comment
March 2004	Completion and issuance of the Feasibility Study Report by the *National Water Department Hunan Investigation Design & Research Institute of Water Resources and Hydropower*	FSR of Dafutan Hydropower Station (March 2004) HND/D075c-1-01	- This first report is based on a capacity of 195MW. The key-financial parameters slightly differs from the same as reported in the following PDR (see above Table 1 in "Response by Project Participants" for details); - Resultant IRR = 6.78%.
January 2005	The project entity decided to invest in the project applying for the CDM status.	Minute of the Board Meeting (12 January 2005)	The decision to apply for CDM was taken on the basis of the available information: at the time this was the outcome of the Feasibility Study Report (March 2004) clearly underlying the lack of financial attractiveness for the project.
November 2005	Completion and issuance of the Preliminary Design Report by the *National Water Department Hunan Investigation Design & Research Institute of Water Resources and Hydropower*	PDR of Dafutan Hydropower Station (November 2005) HND/D075c-1-01	- This second report is based on an adjusted capacity of 200MW. The key-financial parameters have been consequently modified (see above Table 1 in "Response by Project Participants" for details); - The figure of the Static Total Investment in this report it is lower than the same as used in PDD[9];

9 For the IRR calculation in PDD, the costs for the transmission project have been added. As further clarified in the paragraph below, the inclusion of these costs was necessary and correct.

			- The figure of Annual Operational Costs is this report is lower than the same as calculated and used in PDD[10]. - Resultant IRR = 7.12%.

(i) According to the timeline of the events as assessed and verified, it's therefore confirmed that:

1) The PPs decided to apply for the CDM status according to the evidenced lack of financial attractiveness of the 195 MW project. The timeline demonstrate that, at the time of the decision to invest, the opinion on this regard could only rely on the outcome of the first Feasibility Study Report (March 2004) which reported an IRR of 6.78%;

2) The fact that the institute in charge performed a slight amendment on the project's specifications (PDR November 2005), upgrading the installed capacity form 195 MW up to 200 MW, does not affect the final outcome and opinion on the financial attractiveness of the project as evidenced by the PDR itself which reports an IRR of 7.12%.

According to the above considerations it appears evident that the CDM decision (January 2005), which was based on a slightly different project, was still valid under the adjusted capacity of 200 MW and the results of the Preliminary Design Report (November 2005). In this context, the outcome of the PDR (IRR = 7.12% with tax) has been seen by the PPs as a confirmation of the need for CDM; thus no further formal decision to apply for CDM was perceived by them to be required. Moreover, it should be noted that, as further discussed below, the IRR calculated in PDR did not include the costs for the transmission project which have been rightly included in PDD due to the fact that these costs would have been undertaken by the project owner. Furthermore DOE confirms that the choice done by PPs to base the investment analysis on the values as reported in PDR reflects an appropriate approach. It should be in fact noted that DOE considered this aspect during the validation activity; according to the fact that a structural (even if slightly) change was applied to the project's specifications (capacity was increased from 195 MW in FSR dated March 2004 up to 200 MW in PDR dated November 2005), it was found to be a consistent choice to use the adjusted report (PDR dated November 2005) as a source for the input values, even if this document was issued after the CDM decision (January 2005). In other words, the adjusted capacity required the PPs to rely on the adjusted values confirming the need for CDM.
According to this, DOE confirms that this approach does not mine the main validation requirement on this regards which is to state and assess the context behind the CDM decision and the consistency with a logical and consistent course of the events.
(ii) To further confirm and verify the appropriateness and validity of the input values as used in PDD to perform the investment analysis, the assessment team have reviewed each figure as follows:
Static Total Investment:
The figure of this parameter as stated in the PDD, was obtained by the PPs considering the investment for the power plant itself and the costs for the transmission lines and transformer substation. The estimated amount of the transmission project, which was mentioned in PDR as a separate item not included in the costs used for IRR estimation, is 60 Mio Yuan RMB. Evidence of this amount has been verified by the assessment team. Furthermore, a confirmation of the need for this additional investment costs have been found in the Transmission Agree-

10 The paragraph below explains the reason for this difference and how the O&M costs have been calculated

ment signed by the project owner with the Huaihua Electric Group Co., Ltd. on April 6th, 2005, which stated that the costs for the transmission lines and transformer substation were to be undertaken by the project owner. A figure of 1,778.2635 Mio Yuan RMB was therefore used in PDD. This value has been considered reasonable considering the characteristics of the project, providing a unitary investment cost of 8.89 Mio Yuan RMB/MW which is in line with the costs experienced with the large-size hydropower stations.
The reasonability and conservativeness of the figure used for the Static Total Investment in PDD, receives further confirmation comparing it with the costs which have been actually undertaken by the project up to date. In particular, according to the financial balance sheet as requested by the DOE and provided by the project owner, the costs incurred up to October 2008 take the amount to about 1,795.0646 Mio Yuan RMB, even if the project will be completed on early 2009.
It is therefore confirmed that the value assumed in PDD is reasonable and that this value has been verified to be conservative if compared with the costs which have been actually undertaken by the project owner.

Grid Price:

The grid price which was assumed in the PDR and in the PDD to be 0.308 Yuan RMB/kWh (with VAT), has been confirmed by several sources to be the valid one to be used at the time the PDR was issued; the main document which can confirm this is the Power Purchase Agreement 2008, signed between the project owner and the local grid company, which states a grid price of 0.308 Yuan RMB (with VAT) and a document issued by the Huaihua Electric Group Co., Ltd on November 13th, 2008 which confirms that the negotiated grid price for 2009 is set to be 0.308 Yuan RMB (with VAT). Furthermore, as 3 units started commissioning, it has been possible to verify the actual price as reported on an electricity invoice: according to this document dated October 24th, 2008, it is confirmed a price of 0.308 Yuan RMB (with VAT) as the actual electricity price.

DOE is confident that these additional proofs provide reliability of the assessment and of the assumption done by PPs in using such figure for the electricity price.

Annual utilization hours:

A value of 4,032 hours has been assumed in PDD according to the value as reported in PDR. The genesis of this value has been evaluated by the DOE: the hydraulic regime of the Yuan River has been studied by the institute in charge to prepare the PDR considering a consistent amount of historical flow data and water availability, from January 1951 to December 2000. An additional assessment of this figure has led the DOE to consider the statement of the local grid company on this regards; according to the document issued by the Huaihua Electric Group Co., Ltd on November 13th, 2008 the expected power generation for the Dafutan Hydropower Station is stated as about 800,000 MWh, definitely assuming an annual operational period of 4000 hours for 2009.
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.

Annual O&M Costs:

It's clear that the PPs had to consider to calculate the Annual O&M costs basing on the calculated Static Total Investment which, as above explained, was properly assumed as the sum of the investment indicated in the PDR and the costs for transmission lines and transformers.
The annual O&M costs as calculated by the PPs to be 27.9668 Mio Yuan RMB have been considered by the DOE acceptable during the assessment as the calculation parameters match with the local policies and regulations (in terms of overhaul costs, material cost, welfare, maintenance fund, water charge, payroll) and with the situation as evidenced during the on-site audit. Therefore any uncertainty margin has been reduced assessing the choices done by PPs in

assuming the number of employees and the payroll. The number of employees which is the same as indicated in the PDR is 60 persons; this number of employees will be reached as the power plant will be fully operative. Up to November 13th, 2008, according to the document provided by the PPs (Payroll statement issued on November 13th, 2008 by the Hunan Chenxi Dafutan Hydropower Co., Ltd.), the number of employees is 37 with only three operational units working out of the five planned. It deems reasonable to assume that a number of 60 persons will be reached as the remaining two units will start to operate (on early 2009).
Additionally, the annual payroll assumed in PDR of 12,000 Yuan RMB/person has been now considered conservative as the payroll actually received by the workers has been verified to be about 19,518 Yuan RMB/person, according to the above mentioned payroll document.
The DOE confirms that, according to these considerations, the annual O&M costs as stated by the PPs in the PDD have been estimated basing the calculation on provable parameters and reliable assumptions.

Issue 2

Further clarification is required on how the DOE has validated the common practice analysis, in particular: a) the exclusion of hydropower plants consisting of installed capacities below 50 MW; and b) consistency between similar projects cited in the PDD and that in validation report.

Response by the Project Participants:

a) the exclusion of hydropower plants consisting of installed capacities below 50 MW:

according to the "Tool for the Demonstration and Assessment of Additionally", projects are considered "similar" in case they, amongst others, are of "similar scale". We have excluded projects with an installed capacity below 50 MW as the scale of these projects differs significantly from the scale of the proposed project activity (i.e. 200 MW). Beside the significant difference in scale which influences the technical and design specifications, the chosen range can be substantiated by means of official national policy documents:

1) The "Almanac of China's Water Power (2005, page 141)" both provide the same formal definition of hydropower in China, which is the official classification of the Chinese government:

   - large scale hydropower stations include hydropower stations with installed capacity more than 300 MW (including 300 MW);
   - middle scale hydropower stations include hydropower stations with installed capacity between 50 MW and 300 MW (including 50 MW and excluding 300 MW);
   - small scale hydropower stations include hydropower stations with installed capacity between 0.5 MW and 50 MW (including 0.5 MW and excluding 50 MW).

2) The small scale hydropower industry benchmark "Economic evaluation code for small hydropower projects (SL16-95)" provide a special 10% project IRR industry benchmark for small scale hydropower stations:

   - this industry benchmark is significantly higher than the benchmark for normal hydropower stations, and is only applicable to hydropower stations below 50 MW according to the SL16-95 regulation.

These Chinese policies and regulations (different standards/benchmarks) influence the feasibility of hydropower stations below and above 50 MW in a different manner, besides the difference in scale and size, which naturally exists. The total installed capacity of the project activity is 200 MW and we conclude that it is reasonable to exclude hydropower stations below 50 MW as they are not similar in scale.

b) consistency between similar projects cited in the PDD and that in validation report:

Due to the nature of this question, the answer will be provided by the DOE.

Response by TÜV SÜD:
The exclusion of hydropower plants consisting of installed capacities below 50 MW (a) relies on the definition of "similar scale" plants; according to this has been evidenced by PPs and confirmed by the DOE that the most reliable Chinese standards and regulations define the 50 MW capacity as a cutting border between what should be considered as small (below 50 MW) and what should be classified as middle (or large).
The documents considered as reference have been the "Almanac of China's Water Power (2005)" and the "Economic evaluation code for small hydropower projects (SL16-95)" which both have been widely used as authoritative sources also in the CDM context.

The range chosen (50 MW to 300 MW) for the common practice analysis it's therefore confirmed to be appropriate and supported by reasonable argumentations and verifiable documents.

The consistency between similar projects cited in the PDD and that in Validation Report (b) has been object of review by the DOE who confirms that some inconsistent information was included in the Validation Report submitted with the request for registration.

As corrective action, the information will be amended to match with the PDD. It's confirmed that out of 9 "non applying for CDM" hydropower station, six hydropower station have been demonstrated to be state owned and to be developed and operated before 2002, before the issuance of the first "Power System Reform Blue Print" which have substantially modified the market conditions transforming it into a less favourable context; one station, namely Mangtangxi Hydropower Station, even if not state owned, was also developed in 2001, before the entry into force of the above mentioned market reform. The remaining two stations have been object of consideration under paragraph "Sub-step 4" in PDD: Hongjiang Hydropower Station and Wanmipo Hydopower Station have been developed by a large state-owned company (namely China Power Investment Corporation") and PPs demonstrated that both the power plants received heavy funds from the Japanese Economic Cooperation Fund.

A revised Validation Report will be prepared by the DOE to comply with the assessment and with the PDD requesting for registration.