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Att: CDM Executive Board

Your ref.:
 CDM Ref 1804

Our ref.:
 MLEH/GUOK

Date:
 8 October 2008

Response to request for review: “Hejiang County Yuanxing Hydro Project” (1804)

Dear Members of the CDM Executive Board,

We refer to the requests for review raised by three Board members concerning DNV’s request for registration of project activity 1804 “Hejiang County Yuanxing Hydro Project” and would like to provide the below initial response to the issues raised in the requests.

Question 1: The DOE is requested to clarify how it has validated the input values used in the IRR calculation following EB 38, paragraph 54, including the use of fixed input values (tariff and operating costs).

DNV Response:

In order to justify the reliability of the input values used in the IRR calculation in accordance with the guidance of EB38 paragraph 54, DNV has validated the input parameters as follow:

Step 1: Assess the sources of the input parameters

All input parameters for the project IRR calculation, except for the electricity tariff, are taken from the adjusted preliminary design report (PDR) of the project. The adjusted PDR, dated 26 April 2005, was developed by an accredited third party (Sichuan Yibin Hydro-power electricity development designing institute) and approved by Luzhou DRC of Sichuan Province the 30 December 2005.

The electricity tariff is based on the power purchasing agreement (PPA) signed with the local grid company (Luzhou Yuyu Electricity Supply Company) on 18 December 2005, i.e. before the starting date of the project activity (construction permit approval of 16 January 2006).

Therefore, all input parameters used in the IRR calculation can be considered as information provided by independent and recognized sources.

Step 2: Confirm that the values used in the PDD are fully consistent with the adjusted PDR

DNV has cross-checked the IRR calculation input values with the parameters stated in the adjusted preliminary design report and the power purchasing agreement. DNV was able to confirm that the values applied are consistent with the value stated in the documents referenced above.

The PPA confirms that the generated electricity will be purchased by the grid company. The PPA clearly defines the electricity tariff of 230 RMB/MWh for the first 3,700 hours of operation and 190 RMB/MWh for the hours in excess of these 3,700 hours (the proposed Project is expected to

operate 4,369 hours per year). The PPA does not state for how long this tariff is valid nor does it include any provisions for tariff adjustments.

Step 3: Assess the period of time between the approval of adjusted preliminary design report and the investment decision

The adjusted PDR was approved on 30 December 2005 and the PPA on 18 December 2005, thus less than 1 month prior to construction permit approval on 16 January 2006 which was considered as the date of the decision to proceed with the project activity (i.e. the starting date of the project). Given the short time period between approval of the adjusted PDR and the construction permit approval date, it is unlikely that the input values would have materially changed.

It is thus reasonable to assume that the adjusted PDR has been the basis of the decision to proceed with the investment in the project.

Step 4: Cross-check the parameters used in the financial analysis with the parameters used by other similar projects

The input parameters used in the financial analysis were compared with the data reported for 23 other similar proposed hydropower CDM projects connected to the South China Power Grid, e.g. investment costs per kWh, O&M costs per MW, electricity tariff and percentage of O&M costs relative to total investment costs. While DNV acknowledges that the information from these projects is also based on feasibility study reports (FSR) or PDRs, it must be noted that these FSRs and PDRs were developed by several different independent institutes. In addition, based on our sectoral expertise, the input parameters used in the financial analysis are in DNV's opinion reasonable.

Step 5: Sensitivity analysis

According to the "Economic evaluation code for small hydropower projects (SL 16-95)" published by the Ministry of Water Resources, 10% was selected as the benchmark rate. This benchmark is reasonable for small hydropower projects in China. The project proponent uses fixed values for electricity tariff and operating costs for the IRR calculation. DNV was able to confirm that it is in line with the common practice in China.

1. DNV was able to verify through the approved adjusted PDR, that the IRR calculation is accepted by the local authority.
2. The "Economic Evaluation Code for Small Hydropower Project (SL16-95)" also uses fixed input values for IRR calculation. DNV considers appropriate to use fix values for the financial analysis. This is in accordance with SL 16-95 which stipulates that the current price, determined at the time of the assessment, should be used for the input values for the financial analysis.
3. As mentioned in previous section, the tariff is defined in the PPA set by the grid company. As the electricity tariff is always under strong influence of local government price policy, DNV considers reasonable that the project developer could not predict with certainty how the tariff would vary at the time of the decision to proceed with the project.
4. Operating costs are also subject to cost increase determined by macroeconomic trends. However, these variations do not substantially affect the IRR calculation of the project as shown in the sensitive analysis in the PDD.
5. The investment cost, operating cost, annual electricity generation and electricity tariff variation were considered as part of the sensitive analysis.
 - Total investment estimated in the adjusted PDR was 102 300 000 RMB. The investment cost was audited in January 2008 to be 142 325 300 RMB by Sichuan Changjiang Certified Public Accountant (CJCPA) in the Corporate Accounting Report. As the project has finished construction, the investment cost will not change in the future.
 - The operating costs are not sensitive for the IRR calculation as the 10% benchmark will be reached when the operating costs reduce 134% which is unlikely.

- An annual electricity generation increase of 19% will lead to the IRR reaching the 10% benchmark. However, such an increase is unlikely as the annual operating hours of the project indicated in the adjusted preliminary design report was determined by kinetic calculation based on 38 years historical hydrological data.
- For the electricity tariff, the project proponent has used a conservative assumption for the IRR calculation. The tariff used for IRR calculation is 230 RMB/MWh which is the highest value from the two tariffs indicated in the PPA. In addition, DNV has verified through web based information that the current average electricity tariff offered to small scale hydro power projects in Sichuan Province is 191 RMB/MWh, and 178 RMB/MWh in Guizhou Province, these information can be found at the following web link <http://www.china5e.com/dissertation/power/20070907155107.html>. Therefore, an electricity tariff of 230 RMB/MWh is reasonable.

In conclusion, it is difficult for the project developer to predict with certainty what would happen to the electricity tariff in the future at the time of the investment decision. Variations to the operating costs have no substantial impact on the IRR of the project. Since “Economic Evaluation Code for Small Hydropower Project (SL16-95)” stipulates that input values should be fixed, it was reasonable for the proposed project to consider a fixed electricity tariff in the financial analysis. Moreover, the applied benchmark is related to IRR analysis with fixed input values, and an IRR without escalation of the tariff and operating costs is thus suitable to be compared against the selected benchmark.

Question 2: The PP/DOE is requested to clarify how the reported parasitic power loss of 18% is appropriate in the context of the underlying project activity.

DNV Response:

The 18% is the difference between the electricity generated by the station and the electricity actually supplied to the grid. This difference is defined in the IRR calculation spreadsheet as the “power delivered to the grid / total power generation”. The 18% figure is based on the power delivered to the grid and total power generation data shown in the adjusted preliminary design report. The 18% power loss was not explicitly mentioned in the adjusted preliminary design report.

The method to calculate the difference between the electricity generation and the electricity supplied to the grid for small hydropower projects is provided in the “Economic Evaluation Code for Small Hydropower Project (SL16-95)”. Section 3.3.2 of “Economic Evaluation Code for Small Hydropower Project (SL16-95)” states that the electricity supplied to the grid by a project is calculated as follow:

Electricity supplied to the grid = (The designed electricity generation) x (the effective factor for supply to the grid) x (1 – the internal power use rate)

“Economic Evaluation Code for Small Hydropower Project (SL16-95)” also requires that grid transmission losses rate should be considered in the calculation if necessary. The effective factor reflects the quantity of electricity that can be sold to the grid by the project compared to what is generated. The choice of this factor is describe in section 3.4 of “Economic Evaluation Code for Small Hydropower Project (SL16-95)” and depends on the type of power plant. The project is a grid-connected run-of-river project, with a daily/weekly water regulating capacity, therefore the range for the effective factor applicable to this category is 0.7-0.9. This means a 10 to 30% difference between the designed electricity generation and the electricity supplied to the grid, excluding the internal power use rate and the potential transmission losses. Therefore, assuming a 18% difference in the adjusted PDR is reasonable.

Although the calculation of the expected power supplied to the grid for the proposed project (power delivered to the grid / total power generation) is derived in a different way from the method given in the “Economic Evaluation Code for Small Hydropower Project (SL16-95)”, it has no impact on the IRR calculation since the loss range is within the applicable range stipulated in “Economic Evaluation Code for Small Hydropower Project (SL16-95)”.

In addition, the project proponent has provided DNV with evidences on the measured electricity loss from monthly meters readings by the grid company for the period from August 2007 to August 2008. DNV was able to verify that the actual, metered, power generated was 64,907MWh (vs. 65,530MWh expected) and the actual, metered, power supplied to grid was 44,887MWh (vs. 53,730MWh expected). This shows that 20,020MWh of electricity generated was “lost” (internal use and not taken by the grid), which represents a 30.8% “loss”. This is significantly higher than the 18% “loss” assumed in the adjusted PDR.

In light of the above, DNV considers that the power losses estimated in the adjusted PDR were appropriate and conservative and that the observed losses are mainly due to the power plant not being able to supply all its generated power to the grid as they grid did not take all the generated electricity.

Question 3: The DOE should clarify the changes between the PDD published for GSC and the PDD submitted for registration, in particular (a) the project name, (b) location, (c) China grid which will receive the power to be generated, and whether the China DNA has been informed of all these changes.

DNV Response:

DNV has stated in its validation report the changes between the PDD published for GSC and the PDD submitted for registration with regard to the project name, location and the grid which electricity will be exported to. DNV would like to further clarify the reasons for these changes:

1. DNV has received messages from the project developer during the validation that there were mistakes in the PDD that was published regarding the project name, location and grid.
2. DNV was able to verify that the revised project name is in line with the LoA which was issued by Chinese DNA (NDRC). Therefore, DNV did not consider necessary to inform the Chinese DNA (NDRC) about these changes.
3. DNV was able to verify that the location of the Project is E106°09' longitude, N28°46' latitude for the power plant and E106°10' longitude, N28°42' latitude for the diversion dam through the adjusted preliminary design report. As informed by the project developer, there were typo errors in the published PDD. DNV was able to verify that this was in line with the information provided to the Chinese DNA (NDRC). Therefore DNV did not consider it necessary to inform the Chinese DNA (NDRC) about these changes.
4. DNV was able to verify that the project is located in Sichuan Province, which is included in the boundary of Central China Power Grid. However, the project is very close to the border with Guizhou Province (less than 50 kilometers distance in map), which is part of the South China Power Grid. The project developer has provided a letter from the local electricity (grid) company as evidence to DNV showing that the electricity will be exported to South China Power Grid based on the following:
 - a. The local grid company's confirmation that electricity will be export to South China Power Grid.
 - b. The project is located very close to the boundary of South China Power Grid

It must be noted that the emission factor of the South China Power Grid is lower than the emission factor of the Central China Power Grid, hence the change in grid results in a slight decrease in expected CERs.

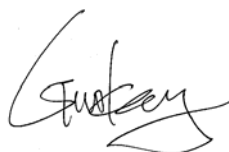
DNV could integrate in its validation report the clarification regarding the above changes if the Board decides it is necessary. DNV would also like to inform the Board that as part of this response the project participant has sent a formal notification to the Chinese DNA (NDRC) informing them above these changes (especially regarding point 4). However, the above changes do not affect the contribution of the project to sustainable development and its CDM eligibility.

We sincerely hope that the Board find our elaboration on the above satisfactory

Yours faithfully
for DET NORSKE VERITAS CERTIFICATION AS



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