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Response to request for review

"20MW Samal Grid-connected Hydroelectric Project in Orissa, India" (0895)

Dear Members of the CDM Executive Board,

We refer to the clarifications to the requests for review raised by the Board members concerning DNV's request for registration of the "20MW Samal Grid-connected Hydroelectric Project in Orissa, India" (0895) and would like to provide the following initial response to the issues raised by the requests for review.

Comment 1:
The PDD is very weak about the availability of water during the crediting period; generating uncertainty about the GHG reductions and variation between the design and future production of clean energy (shared with irrigation). It is required to attach a recent analysis of the scenarios of water supply and show the economical effect in the investment analysis.

DNV Response:
As indicated in our validation report the project activity is located *at Samal, near the Samal barrage pond, on the left bank canal of the Samal irrigation project, in the state of Orissa, India. The barrage is an existing barrage used for irrigation purposes.* This location is also downstream of Rengali Dam, across Brahmani river and the main source of water for the project activity. The powerhouse at Rengali dam has been operational since 1985.

Sufficient availability of water for the project activity is demonstrated through the following:

1. DNV has verified the daily discharge data (attested by the office of the Chief Engineer & Basin Manager, Brahmani left basin, Samal) from the Samal barrage, which clearly indicates that there has been continuous water supply between 1996 and 2006. Annexure 2 of the response from the client OPCL provides the monthly data for the ten year period starting 1996.
2. The detailed project report (DPR) for the project activity, as approved by the State Technical Committee of the Government of Orissa and verified by DNV, considered the water availability data as reported by WAPCOS (a Government of India consultancy organization specialized in hydro electric power projects). The study considered water drawals for irrigation purposes in a phased manner and appropriately the project activity

addressed a power generation potential of 123 GWh to 105 GWh between the years 2006 and 2015. This was also the basis for the investment analysis. Annexure 3 of the response from the client OPCL demonstrates that the requirement for downstream riparian rights/discharges has increased from 60 cumecs to 110 cumecs. This indicates that the increased quantum of water required for the riparian rights at the down stream of the barrage, which is presently being released through the river sluices of Samal Barrage, shall also have to be discharged through the proposed power station located on the left bank canal, which maintains the power generation of the project activity

3. Annexure 5 of the response from the client OPCL, also demonstrates the following:

- Dispatch of water through left bank canal (LBC) and right bank canal (RBC) of Samal barrage for irrigation requirement as on date are far less than what has been considered by WAPCOS.
- The pace of work on the LBC and RBC is not commensurate with plans which indicates that the actual irrigation demands might not be as projected in the DPR, during the crediting period

The power generation and investment analysis has been reviewed and revised in the light of the data for 2002-2003 (Annexure 7 of the response from OPCL) which has been considered to be a dependable year, based on analysis of the water discharge data from Samal barrage over the last 21 years. The analysis demonstrates the following:

- The IRR is determined to be 11.59% without CER revenues and is lower than the WACC at 15.53%.
- The power generation is expected to improve to 6.20% in the first year, 9.43% between second and fourth years, and 9.15% between fifth and ninth years and by less than 1 percent in the tenth year. It is to be noted that a sensitivity analysis (variation by 10%) has already been considered and validated for annual exports to PTC India Ltd and demonstrated that that the IRR is always less than the WACC.

The IRR analysis has been verified and enclosed as attachment 2 in the response from OPCL, together with the financial analysis as addressed during the validation of the PDD (attachment 1)

From the above it is clear that there is sufficient availability of water during the crediting period and the generation uncertainty about the GHG reductions and variation between the design and future production of clean energy (shared with irrigation) have been addressed and mitigated.

Comment 2:

The PDD shows an analysis using the IRR and WACC that is correct in logic, but very difficult to verify in the annexes. There is a calculation done by chartered accountants, that is essentially correct about the WACC and the explanations on the capital structure, but the calculation of the expected return is done using the average value of the Cum. Yearly return in the Indian stock market and the expected return based on risk premium analysis (the typical formulae uses a Expected Value = risk free interest +market Beta(market risk premium)). The government securities of 7% is an acceptable value (US T-bonds would have been a little better), but the calculation of the market Beta is not clear. The lack of a spreadsheet with the algorithm makes impossible to verify this part.*
It is required to attach the original spreadsheet or ask for a specific explanation of the calculation of financial risk, in particular market Beta coefficient.

DNV Response:
It has been demonstrated and verified by us that the expected return (R_i) on investment in the project activity (24.51%) has been arrived at as the average of:

- average yearly return of the Indian stock market (S&P CNX Nifty) over three year period, i.e., April 2002-March 05, working out to 26.05% per annum after adjustment for transfers to reserves and tax; and
- a risk-adjusted return computed from estimated risk levels of Government Securities (risk level = 25) and stock markets (risk level= 82), which correspond to the subjective assessments* of investors about the risk of different securities. In the PDD attachment, the risk-adjusted return has been approximated by multiplying the risk-free return with the ratio of the respective risk levels, working out to 7% X 82/25 = 22.96%

The market beta coefficient has been taken to be 1, which is deemed to be conservative for a country like India, and the underlying assumptions and justification provided by OPCL for the same is deemed acceptable by DNV. It has also been demonstrated that with a beta coefficient of 0.5, the WACC is determined to be 12.2% which is still higher than the project IRR without CER revenues at 10.31%.

The attached spreadsheets (attachements 1, 2 and 3 of the response from the client OPCL) demonstrate that financial risks of the project were adequately addressed in the calculations of the WACC.

We sincerely hope that the Board accepts our aforementioned explanations and we look forward to the registration of the project activity.

Yours faithfully
for DNV CERTIFICATION AS

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* How Good Are Mutual Funds, L.C. Gupta and Utpal K. Choudhury, Society for Capital Market Research and Development, New Delhi (2001), p.48