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Att: CDM Executive Board

Your ref.:  
CDM Ref 2190

Our ref.:  
BRINKS/VRI/DUDAG

Date:  
24 February 2009

## Response to request for review for project 2190 “Sichuan Yanyuan Yongning River Hydropower Station”.

Dear Members of the CDM Executive Board,

We refer to the requests for review by three Board members concerning DNV's request for registration of the project activity “Sichuan Yanyuan Yongning River Hydropower Station” (2190) and would like to provide the following response to the issues raised.

**Question 1:** *Further clarification is required how the DOE has validated the stop of construction, reason for stop of construction and the decrease in IRR (15.7% to 7.59%)*

### DNV Response:

The Sichuan Yanyuan Yongning River Hydropower Station was initially conceptualized as a 25 MW power plant in 2003. The FSR from June 2003<sup>1</sup> indicated a project-IRR of 15.7% that is financially attractive compared to the benchmark, which is 10%. The construction started in February 2004, which was verified by DNV by means of the order for starting construction.<sup>2</sup> The construction was stopped in August 2004, based on a statement from the project owner (at that time).<sup>3</sup> The construction re-started again 18 July 2005, based on information from the local government.<sup>4</sup> The construction was therefore stopped for 11 months.

The stated reason from the project participants was that the project owner wanted to expand the capacity from 25 to 50 MW, which was considered in a FSR from July 2004, i.e. just months after starting construction and before the project stopped construction. It was also mentioned bad local geological conditions and lower tariff.

The effect of these geological challenges on the IRR has not been quantified to DNV and is therefore not possible to take fully into consideration. For example if the additional geological expenses are less than the sunk costs at that point of time in construction, the IRR at that time of time would not be worse than the IRR before the construction started. However, the second FSR

<sup>1</sup> Feasibility Study Report 25MW hydropower plant prepared by the Survey and Design Institute of Water Resources and Electric Power of Lingshan Prefecture, dated June 2003.

<sup>2</sup> The order for starting construction for 25 MW, issued by Sichuan Xichan Electricity Co. Ltd to Yongsan Project Department Dujiangyan Construction Installation Co. Ltd, dated 26 February 2004.

<sup>3</sup> Statement on the Construction stop of Yongning River Hydropower Station, issued by Sichuan Xichang Electricity Power Co. Ltd, dated 17 August 2004.

<sup>4</sup> The proof issued by the Yanyuan County People's Government, dated 20 July 2005.

(related to the 50 MW power plant) from July 2004 clearly refers to bad geological conditions including debris flow, landslide and collapse.<sup>5</sup>

It was not presented to DNV a financial analysis for continuation of the 25 MW power plant with additional geology-related costs and reduced tariff (the tariff document with 27% tariff reduction compared to first FSR was issued on 14 July 2004, i.e. at the same time as the second FSR<sup>6</sup>), but taking the sunk costs from the already completed construction into account. This alternative would have been a third alternative in addition to the two alternatives discussed; 1) stop all construction and 2) construction of a 50 MW power plant.

The two alternatives mentioned were considered in the FSR and a benchmark analysis showed a project-IRR of 8.64% after taking sunk costs from initial investments correctly into account (without the sunk costs the project-IRR was estimated to 7.59%). This is below the benchmark and therefore it is considered a better option to abandon the power plant construction than to continue with a 50 MW power plant.

Regarding the third option, DNV considered it more likely that this alternative was given up and the construction stopped for 11 months for other reasons, e.g. for improved water utilization, than for taking part in CDM. However, we acknowledge that this possibility should have been further described in the PDD and the validation report.

**Question 2:** *The DOE is requested to clarify how the residual value of the operational lifetime has been validated as the validation report mentions 25 years operational lifetime according to FSR.*

**DNV Response:**

The expected operational lifetime of the proposed project activity is 20 years as per the approved FSR<sup>6</sup>. The validation protocol was completed based on the PDD version 0.2 of 12 April 2007 which established the expected operational lifetime in 25 years but after checking the approved FSR of 50 MW hydropower plant, was confirmed that the operational lifetime of the proposed project activity was 20 year. In the DNV validation report, in Section 4.2 of the Project Design, has been included erroneously the operational lifetime of 25 years, but in Section 4.4 of the Additionality it is stated that the financial analysis has been performed for the operational lifetime of 20 years.

DNV was able to verify the documented evidences listed above during the validation process and therefore DNV can confirm that this is a typo.

**Question 3:** *The DOE is requested further clarify the suitability of the input values to the investment analysis as per the requirements of EB 38 paragraph 54(c) guidance, including, the appropriateness of reported values of annual electricity generation and power supply to grid.*

**DNV Response:**

As mentioned in the response to *Question 1*, the hydropower plant has started the construction on February 2004 without considering the CDM contribution and its initial capacity was 25 MW and for the reason mentioned above the project stops the construction from 17 August 2004 to 18 July 2005 when the re-start the construction<sup>11</sup> with a capacity of 50 MW.

<sup>5</sup> Feasibility Study Report 50 MW hydropower plant prepared by the Survey and Design Institute of Water Resources and Electric Power of Lingshan Prefecture, dated June 2003 and approved by the Development and Reform Commission of Liangshan Yi Prefecture on 7 December 2004.

<sup>6</sup> Approval on Grid Price for Yongning River Hydropower Station, issued by Liangshan Prefecture Price Bureau, dated 14 July 2004.

The resulting project-IRR of the installed capacity of 50 MW in the investment analysis is 7.59% which is lower than the benchmark of 10%.

The initial investment of 20 million Yuan RMB, done before to re-start of the construction, utilized for geological and soil preparation, have been considered as sunk costs and not included in the financial analysis of the CDM project. This initial investment has been confirmed from the capital verification report<sup>7</sup>. The revised project-IRR is 8.64%. This is below the small scale hydropower benchmark of 10% and the project is not financially attractive compared in the absence of CDM benefits.

DNV has validated the input parameters used according to the “*Guidance of EB38 paragraph 54(c)*”. The following steps have been followed to assess the investment analysis:

*Step 1: assessment of the sources used input parameters.*

All input parameters used in the financial analysis are taken from the Feasibility Study Report (FSR) developed by an independent officially accredited entity. The FSR input parameters were verified and approved by the DRC of Liangshan Yi Prefecture on the 7 December 2004<sup>6</sup> and can thus considered information provided by independent and recognized source.

*Step 2: confirmation that the values used in the PDD and investment analysis are fully consistent with the FSR.*

DNV compared the input parameters for the financial analysis included in the PDD with the parameters stated in the FSR and was able to confirm that the values applied are consistent with the values stated in the FSR.

*Step 3: assessment of the period of time between the finalization of the FSR and the investment decision.*

The FSR of the installed capacity of 50 MW was approved on 7 December 2004, thus only seven months prior to the decision to proceed with the project activity which was on 18 July 2005 (the project starting date). Given this relative short period of time between approval of the FSR and the decision to proceed with the project activity, it is unlikely in the context of the project that the input values would have materially changed. Thus is reasonable to assume that the FSR has been the basis of the decision to proceed with the investment in the project.

*Step 4: cross check of the mains input 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 data reported for other similar proposed CDM projects in Sichuan Province by comparing investment costs per MW, percentage of O&M costs relative to total investment, electricity tariff. From the financial point of view, a project has been considered similar if situated in the same Province even though they could have different capacity. By comparing the investment costs and the operational maintenance costs per MW, DNV can confirm that the input parameters used in the financial analysis are reasonable and adequately represent the economic situation of the project.

The net annual electricity generation and supplied to the grid accounts to 201 390 MWh as per the approved FSR, which has been estimated taken into account the hydrological conditions of water resource availability and based on the 36 years of historical data from 1960 to 1995. The net annual generation electricity is calculated considering the effective electricity of 90% (which is a conservative value for run-of-river power plant and in accordance with the Economic Evaluation Code for Small Hydropower Projects SL16-95), the auxiliary power consumption of 0.5% and the

<sup>7</sup> Capital Verification Report dated 5 July 2005.

line loss of 2.926% and the formula is stated in approved FSR. Having checked the FSR during the validation process, DNV can confirm that the annual power supplied to the grid is appropriate.

**Question 4:** *The DOE should clarify how it has validated the common practice analysis, in particular, the selected range of 15-50 MW, as the project activity is a 50 MW hydro power plant.*

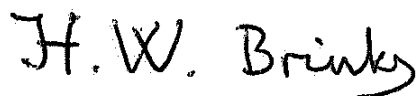
**DNV Response:**

DNV considered originally the common practice analysis from 15-50 MW by verification of the Yearbook of China Water Resources 2006. There are 12 projects in this capacity range that was developed after 2002 as non-CDM projects, of which 9 are developed by state-owned companies and therefore do not have comparable investment climate and access to funding. The three remaining projects had significantly higher tariff than this project and are therefore more financially viable.


As a part of this request for review, the project participants have expanded the common practice analysis up to 75 MW. The reason why this was not done originally is that 50 MW is the limit to large scale hydro power plants, where different evaluation codes and benchmarks are used. DNV has for this request for review not been able to verify the data sources and we would like to refer to the answer from the project participants for their presentation of the financial parameters of the three projects found between 50 and 70 MW, developed after 2002. The tariff and load factor for all projects are better than the present project, which shows that the current project is not common practice.

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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