# Response to request for review "25.3MW WHR Project of Zhejiang Leomax Group" with the Reference Number 1874

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Dear Members of the CDM Executive Board,

We were informed that our project "25.3MW WHR Project of Zhejiang Leomax Group" (Reference number 1874) was requested for review by CDM Executive Board. As required by the Executive Board and on behalf of the project participants, we would like to answer the questions and clarify the issues raised in the requests for review as follows:

#### Question 1:

The DOE is required to explain how it has validated the investment analysis, the appropriateness of the input values used, and the use of fixed input values in line with EB 38, paragraph 54 (c).

#### PP's response:

EB38, paragraph 54 requires:

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:

(a) The FSR has been the basis of the decision to proceed with the investment in the project, i.e. that the period of time between the finalization of the FSR and the investment decision is sufficiently short for the DOE to confirm that it is unlikely in the context of the underlying project activity that the input values would have materially changed.

(b) The values used in the PDD and associated annexes are fully consistent with the FSR, and where inconsistencies occur the DOE should validate the appropriateness of the values.

(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.

We confirmed again that all of the input values for investment analysis of the project activity are from the approved feasibility study reports (FSR) which had been submitted to the DOE for verification during validation. These three feasibility study reports were

prepared by the design institute, Tianjin Cement Industry Design & Research Institute Co., Itd (TCDRI), who is accredited as grade B by the Ministry of Construction in China. The accreditation certificate had also been verified by the DOE during validation. The TCDRI has considerable experience in this field and its analysis solely based on guidance issued by the government and independent institutions. All values used for the investment analysis in the FSR are sourced from these guidances and DOE has confirmed that.

As stated in the PDD, the FSR for Jiande plant was completed in March 2006, for Guangde plant in December 2005 and for Tonglu plant in December 2006. The FSRs for Jiande and Tonglu were approved by the local authority, Zhejiang Economic and Trading Commission on 18 May 2006 and 9 January 2007. The FSR for Guangde plant was approves by the local authority, Anhui Economic and Trading Commission on 31 August 2006. The construction of the project activity started on 30th Oct 2006 which was determined by the earliest construction start permission dates of three cement factories. The time between the FSR and the construction starting permission date of the underlying project activity is sufficiently short for the data in the FSR to be valid and applicable at the time of investment decision according to the requirement of EB 38 paragraph 54.

Regarding to the fixed input values for the investment analysis, this is the common practice in China when conducting investment analyses in FSRs or PDRs. The reasons are as follows:

- (i) According to the "Economic Assessment method and Parameters for Construction Project", the third edition, 2006 (issued by National Development and Reform Commission of China), it can be clearly seen that the parameters used in the calculation should be constant throughout the assessment period. "It is difficulty to forecast change for the price of input goods and output goods in the early study phase because the long operate period. And the results of the forecast are uncertainty, so a fixed price should be used in the operation period". IRR calculations in FSRs and PDRs in China are hence calculated with a fixed tariff, and the proposed project activity follows common practice in China.
- (ii) Because the electricity tariff is related tightly to the national economy and livelihood of people, the tariff is controlled strictly by Chinese government and will not be changed without the permission of Chinese government. The adjustment of electricity tariff results from negotiations by several government departments and may even need to be approved by the CPC Central Committee. And if using various electricity tariffs for financial analyses, the various O&M costs such as salary, material costs, etc should be used accordingly. Because it is difficulty to do accurately and the inflation of O&M costs in China is higher than the tariff, tending to cancel out the escalation in the tariffs, a fixed tariff is commonly adopted in the investment analyses in China.

During the recent seven years from 2002 to 2006, the maximum annual increasing rate of electricity tariff is 4.2% in China and this data is from the announcement of National Bureau of Statistics of China<sup>1</sup>.The price index of materials (mainly water), wages and welfare annual increase by 6.4% and 16.3% (maximum) in the same period and same source, it means that the annual O&M cost<sup>2</sup> increased more than the electricity. In other words, a general price index increase (called inflation) affects all relevant cash flows of a baseline and project scenario and is included in the so-called discount rate of a nominal NPV analysis, by definition. It has been shown based on past experience that the project's cash outflows are faced by a bigger inflation than the cash inflows (the electricity tariff in particular) and thus, if at all, the electricity tariff would have to be adjusted downwards over the years, in a nominal NPV analysis. With this an increase of only the electricity tariff is unrealistic.

What's more, using the increment of minimum, average and maximum increasing rates of China in resent five years for the power tariff and O&M costs<sup>3</sup> respectively, the IRRs will always be below the benchmark of 12% (see the table below) and the IRR in PDD which was used the fixed input parameters also. The calculation process can be referred to the attached spreadsheet.

The increasing rate of po and O&M	Maximum	Minimum	Average	PDD	
	IRR	2.42%	negative	negative	7.47%
Tonglu	NPV	-11.74 million	-25.14 million	-21.60 million	-7.21 million
	IRR	4.19%	negative	negative	8.07%
Jiande	NPV	-11.22 million	-22.64 million	-19.51 million	-7.03 million
	IRR	7.42%	negative	1.95%	7.92%
Guangde	NPV	-9.94 million	-20.49 million	-17.27 million	-9.37 million

Table 2 The IRR and NPV when annum increasing rate of power tariff and O&M fluctuate

In addition, Jiande plant started commissioning in September, 2007 and the actual annual

<sup>&</sup>lt;sup>1</sup> http://www.stats.gov.cn/tjsj/ndsj/2007/html/I0916e.htm, http://www.stats.gov.cn/tjsj/ndsj/2007/html/E0522e.htm

 $<sup>^{2}</sup>$  More than 66% of annual O&M costs is water costs and wages and the others are mainly the manager fee of

power station which will fluctuate with the electricity tariff.

<sup>&</sup>lt;sup>3</sup> The lower CPI of the wage and water fee.

power supply is 59979 MWh which is only a little higher (1.65%, below 10.49% used in the sensitivity analysis) than the estimated value in the FSR/PDD (59880 MWh). Even using 59979 MWh for investment analysis, the IRR of Jiande plant will not achieve the benchmark. The actual fixed investment of Jiande plant is 53 million which is higher than the estimated value in the FSR/ Spreadsheet of IRR calculation (52.94 million). The average electricity tariff (excl. VAT) in 2007 is 0.301 RMB/KWh which is lower than that estimated in the FSR /PDD (0.308 RMB/KWh). So the input value of investment analysis can be considered plausible.

Guangde plant started commissioning in July, 2007 and the actual annual power supply is 50350 MWh which is lower than the estimated value in the FSR /PDD (57540 MWh). The actual fixed investment of Jiande plant is 58.78 million which is higher than the estimated value in the FSR / Spreadsheet of IRR calculation (58.77 million). The average electricity tariff (excl. VAT) in 2007 RMB/KWh is 0.295 which is lower than that estimated in the FSR /PDD (0.297 RMB/KWh). So the input value of investment analysis can be considered plausible.

Tonglu plant will finish construction in December 2008, so the actual total investment and power supply are not available. However, the design institute and the owner of Tonglu plant, Jiande plant and Guangde plant are the same and from the actual values of Jiande and Guangde, it can be seen that the estimated parameters in the FSR are similar with the actual values. The average electricity tariff (excl. VAT) in 2007 is 0.294 RMB/KWh which is lower than that estimated in the FSR (0.302 RMB/KWh). So the input value of investment analysis can be considered plausible.

From above comparisons, we believe the validity, applicability, appropriateness and conservativeness of the input values used in the PDD can be recognized financial analysis is required to be done in accordance with the requirement of EB 38, paragraph 54 (c).

## Question 2:

The DOE is requested to explain how it has validated that importation from the grid is the most economically attractive alternative.

#### PP's response:

As mentioned in PDD, all of the technically feasible options are listed below:

Scenario 1) Proposed project activity not undertaken as a CDM project activity;

- Scenario 2) Continuation of import of equivalent electricity from ECPG;
- Scenario 3) Installation of a new thermal power plant

It has been discussed that alternative 3 faces the barriers from laws and regulations in Section B.4 of the PDD. Thus this alternative has been excluded from baseline scenario options.

In clause 15 of the guidance on the Assessment of Investment Analysis which is from the

annex 45 of EB 41 meeting report, it states that "If the alternative to the project activity is the supply of electricity from a grid this is not to be considered an investment and a benchmark approach is considered appropriate." As the alternative to the project activity is continued import of electricity from the grid, the project developer's decision is simply to invest in the project activity or not invest (i.e. the project developer does not require the project activity to provide its limited electricity demand as it can be sourced from the grid). The following elaboration in the aforementioned EB 39 Report Annex 35 is relevant: "The benchmark approach is therefore suited to circumstances where the baseline does not require investment or is outside the direct control of the project developer, i.e. cases where the choice of the developer is to invest or not to invest."

Furthermore, the NPV for alternative 1 and 2 are calculated separately and compared to reflect the economically attractiveness of the alternatives.

- (i) For Tonglu plant: The NPV for alternative 1 is -130.45 million RMB and for alternative 2 is -123.24 million RMB.
- (ii) For Jiande plant: The NPV for alternative 1 is -128.44 million RMB and for alternative 2 is -121.41 million RMB.
- (iii) For Guangde plant: The NPV for alternative 1 is -122.09 million RMB and for alternative 2 is -112.72 million RMB.

The NPV results can be fund in the spreadsheet attached to this document and are based on the economic analysis previously submitted to the DOE. Thus alternative 2, i.e. the electricity import from the grid is the more economically attractive one.

## Question 3:

The DOE is requested to clarify how the project emission has been validated in absence of historical data for other lines (except Jiande line), as required by the methodology, and to confirm that the project activity will not lead to an increase in fuel consumption from the normal operation of the plant.

## PP's response:

According to the AM 0024 (version 1), "Ex-ante estimate of PEy could be based on feasibility report for the project activity." And AM 0024 also states, for the average annual energy consumption, "If a year's worth of pre-Project Activity data is not available, then the Project Developer should outline the plan for ensuring conservativeness based on a combination of the ex ante design estimate of energy consumption plus available measured data."

For this project, during validation phase, only two months actual data for the Jiande can be available, Guangde was not in normal and Tonglu was not start to construct. So in the PDD, the PEy only based on the actual data for Jiande was given as -1.429 tCO<sub>2</sub>e. Considering the similar for the Tonglu and Guangde in the capacity, technology and owner of the cement production lines to that in Jiande, the PEy of Tonglu and Guangde was estimated as zero which is conservative.

In order to confirm further, the PEy of Guangde and Jiande which are operated more than one year has been calculated as below table and spreadsheet based on the actual operation data (The Tonglu plant will finish construction in December, 2008, so the actual values after project activity operates are not available) :

Parame ter	Energy co the projec	nsumption t activity	before the o	operation of	Energy consumption after the operation of the project activity <sup>4</sup>			
	$O_{Clinker,B}$ $Q_{fuel,B}$ $NCV_{fuel,B}$		$NCV_{fuel,B}$	EI <sub>B</sub>	$O_{Clinker,y}$	$Q_{\it fuel,y}$	NCV <sub>fuel,y</sub>	$EI_{p,y}$
	А	ВС		D=B×C/A	E	F	G	H=F×G/ E
Unit	t	t	GJ/t	GJ/t	t	t	GJ/t	GJ/t
Source	Project	Project	Project	Calculatio	Project	Project	Project	Calculati
Source	Entity	Entity	Entity	n	Entity	Entity	Entity	on
Value	1,691,20 0	259,088	24.098	3.69	1,350,8 40	220,589	21.78	3.56

Table 2 Energy consumption of clinker production (Guangde)

Table 3 Ex-ante estimate of project emission (Guangde)

Parameter	EI <sub>B</sub>	$EI_{p,y}$	NCV <sub>fuel,y</sub>	OXID <sub>fuel</sub>	% Carbon in coal	$EF_{CO_2, fuel, y}$	$COEF_{fuel,y}$	$O_{Clin\mathrm{ker},\mathrm{y}}$	PE <sub>y</sub>
	А	В	С	D	E	F=Ex44/12	G= (D×F)/C/100	н	I=(B-A) ×G×H
Unit	GJ/t	GJ/t	GJ/t	%	%	tCO <sub>2</sub> e/t	tCO <sub>2</sub> e/GJ	t	tCO <sub>2</sub> e
Source	Calculation	Calculation	Project Entity	IPCC 2006	Initial value provided by	Initial value provided by Project Entity	Calculation	Initial value provided by Project	Calculation

<sup>4</sup> The documents after the operation of the project activity are from November 2007 to October 2008.

					Project			Entity	
					Entity				
Value	3.69	3.56	21.78	100	47.16	1.73	0.08	1,350,840	-13,942

From the table 3, it can be seen that the actual PEy of Guangde is -13,942 tCO2e. And it is shown that assume of PEy is plausible.

Table 4 Energy consumption of clinker production (Jiande)

	Energy co	onsumption	before the o	operation of	Energy consumption after the operation of				
	the project	t activity			the project activity5				
Parame ter	$O_{Clin  \mathrm{ker}, B}$	$Q_{{\it fuel},{\it B}}$	$NCV_{fuel,B}$	EI <sub>B</sub>	$O_{Clinker,y}$	$Q_{\it fuel,y}$	NCV <sub>fuel,y</sub>	$EI_{p,y}$	
	А		0	D=B×C/A	-	-	0	H=F×G/	
		Б	C		E		G	Е	
Unit	t	t	GJ/t	GJ/t	t	t	GJ/t	GJ/t	
Source	Project	Project	Project	Calculatio	Project	Project	Project	Calculati	
Source	Entity	Entity	Entity	n	Entity	Entity	Entity	on	
Value	1,755,08				1,813,1				
	2	277,010	23.046	3.64	81	286,644	21.90	3.46	

Table 5 Project emission of Jiande

Parameter	EI <sub>B</sub>	EI <sub>p,y</sub>	$NCV_{fuel,y}$	$OXID_{fuel}$	% Carbon in coal	$EF_{CO_2, fuel, y}$	COEF <sub>fuel,y</sub>	$O_{Clin  \mathrm{ker}, y}$	PE <sub>y</sub>
	А	В	С	D	Е	F=E×44/12	G= (D×F)/C/100	н	I=( B - A) ×G×H

<sup>5</sup> The documents after the operation of the project activity are from October 2007 to September 2008.

Unit	GJ/t	GJ/t	GJ/t	%	%	tCO2e/t	tCO2e/GJ	t	tCO2e
Source	Calculation	Calculation	Project Entity	IPCC 2006	Initial value provided by Project Entity	Initial value provided by Project Entity	Calculation	Initial value provided by Project Entity	Calculation
Value	3.64	3.46	21.90	100	43.47	1.59	0.07	1,813,181	-23,429

From the table 5, it can be seen that the actual PEy of Jiande is -23,429 tCO2e. And it is shown that assume of PEy is plausible.

From the analysis above, it can be concluded that the project activity will not lead to an increase in fuel consumption from the normal operation of the plant and applied the Jiande data to estimate the project emission is reasonable.

