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Att: CDM Executive Board

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CDM Ref 1027	TRIKA/MLEH	26 June 2007

Response to request for review
"Transalloys Manganese Alloy Smelter Energy Efficiency Project" (1027)

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 the "Transalloys Manganese Alloy Smelter Energy Efficiency Project" (1027), and we would like to provide the following response to the issues raised by the requests for review.

Comment 1:

"A clear investment and sensitivity analysis for all 5 furnaces explicitly following step 4 of AM0038 has not been conducted to demonstrate that the project activity without the CDM is economically less attractive than the most plausible baseline scenario."

DNV Response:

It has been demonstrated from the calculation of the net present value (NPV) and internal rate of return (IRR) that the project activity undertaken without the CDM credits is economically less attractive than the most plausible baseline scenario being the continued use of the existing furnace technology. The investment analysis is based on the achieved performance after implementation of the new technology in furnace # 5 and # 7 and includes data collected for 14 and 27 months operation respectively. The average achieved performance was used to calculate NPV's and IRR's for 10 years operation. DNV considered the financial analysis for furnaces # 5 and # 7 to be representative also for the remaining furnaces and has thus accepted that only an investment and sensitivity analysis was carried out for two of the five furnaces.

This project presents a step-wise implementation plan up to 2009 for the five furnaces. DNV has analysed the NPV and IRR calculations for two of the furnaces, furnace #5 and #7. Excel spreadsheets made available to DNV provided monthly data from October 2004 to December 2006 for furnace #7 and November 2005 to December 2006 for furnace #5 [1]. The spreadsheets includes data for investment, production costs, sales prices and revenues, cost of sales, average cost of electricity, savings related to reduced electricity consumptions, and savings related to reduced maintenance costs. The NVP and IRR analysis are based on the observed (actual) and expected average monthly data from the project. The analysis reveals the actual sensitivity of this project, being the financial cost related to the technology risk in not obtaining the targeted efficiency of the project. The financial analysis shows that unless the technological barriers are

[1] Referred to as "Source: Payback Eval Schedule Dec 2006" in page 71 of the PDD v.5 of 2 March 2007

resolved the IRR will be negative also when including the revenues from the sales of CER's. DNV has therefore included the following statement in the validation report with regards to the additionality of this project: "*Financial analysis based on achieved performance after two years shows that the economic attractiveness of the project activity is uncertain and that the project activity undertaken as a CDM project still faces barriers. However it is clear that the impact of the CDM registration will alleviate and diminish the financial barrier of the project activity*".

The project participants have as a consequence of the request for review made available to DNV a new financial analysis comprising all furnaces and a sensitivity analysis. The new analysis is partly based on actual financial data from the results of furnace #5 and #7, and partly on expected performance of the technology and data from reliable sources. DNV has investigated the new analysis and found it to be consistent to the analysis presented earlier when using the same input data to the analysis. The below table summaries the parameters used in the new analysis and also includes the basis used for the previous analysis. The new analysis shows a more conservative approach than the previous analysis based on actual data.

Parameter	New analysis	Previous analysis with actual data for Furnace #5 and #7	Observation *)
No. of year used in the NPV and IRR calculations	10 years	10 years	Hence no change compared to previous analysis
Investment cost	Actual for furnace #5 and #7. Estimated for remaining furnaces.	Actual investment cost	Hence no change compared to previous analysis.
Discount rate	12%	12%	The discount rate is appropriate to the country and is the average interest rate on loans provided by The Development Bank of Southern Africa in 2002/03 (13.5%) and in 2003/04 (11.0%).
Electricity savings	0.1 MWh/t SiMn	Actual achievement	To date actual achievement show negative average electricity savings as a consequence of technical problems. Expected target was very optimistic and set to 0.4 MWh/t SiMn originally. The new target of 0.1 MWh/t SiMn is based on the assumption of achieving more steady operational conditions. ***)
Production rate**)	Historical rates for all furnaces: 100%	Actual rates Furnace #5= 97% Furnace #7= 93%	Target prior to implementation was higher production rates than the achieved, however due to operational problems the experienced production rate is below

			the historical rates for furnace #5 and #7. Expected targets were originally set higher and up to about 30% increased production rate.
Cost of electricity	113 R/MWh	Average value from implementation up to end 2006: Furnace #5=101 Furnace #7=109	113 R/MWh is based on price paid by Transalloys in 2004 taking into account tariff band and season.
Maintenance cost ”Shot term repairs”	Actual observed savings for furnace #5 (48%) and #7 (24%) 40% for the remaining furnaces.	Actual observed furnace #5 (48%) and #7 (24%)	Targets were set higher than the observed values and 50 -60% reduction was originally included in the first analysis.
Revenues from sales	2835 R/t product	Actual achieved sales price.	The average actual sales price was higher than in 2004. For reduced production rates (as experienced) this will result in a more negative NPV’s and IRR.

*) The previous analysis was including an analysis referred to as “expected” showing positive NPV’s and acceptable IRR’s. All of the above parameters were then set at high targets (indicated in observation column in above table). These targets has so far not been reached and hence the expected NPV and IRR values previously calculated for “expected” conditions are facing technical barriers.
**) Production rates are compared to historical production rates from 1997 to 2003.
***) During DNV’s site visit in December 2006 production logs were studied, the monthly electricity consumption per ton of product was varying quite substantially, this is also seen in later documentation received up to December 2006. Some monthly observations have achieved an electricity saving higher than 0.1 MWh/t SiMn, however in order to achieve an average saving in this range technical problems and a more steady operation is required. Thus it is obvious that a target of 0.1 MWh/t SiMn seems a more realistic target than the original target of 0.4 MWh/t SiMn.

An analysis made by DNV reveals that the main issue for this project is to eliminate the technical barriers. This can be shown in the new analysis by setting the production rate at historical rates (thus eliminating the effect of revenue from sales), keeping the actual observed values for maintenance savings, using a discount rate of 12% and insert the electricity saving target of 0.4 MWh/t SiMn. The IRR (20 years) is then in the range from 15 to 23% and IRR (10 years) in the range of 9% to 19%. With reference to the above table comment (***) it is however clear that a more realistic target for electricity saving would be 0.1 MWh/t SiMn; the NPV (10 years) will then be negative for all furnaces and the IRR (10 years) will be in the range 3-8%.

DNV is therefore arriving at the same conclusion as given above and regards the technology risk to be the main barrier for this project.

Comment 2:

"The screen shots of the spreadsheets used to calculate the IRR and NPV of the project activity are not clearly presented and the actual IRR of the furnace 7 is not shown (p15 and p71)".

DNV Response:

Page 15 of the PDD shows the aggregated results of the detailed monthly data given in the spread sheet[1] and the summary of results from the NPV and IRR analysis as given in page 71 of the PDD. Page 71 of the PDD includes the assumptions used in the NPV and IRR analysis, the calculation of the revenues from CER's, the annual and monthly aggregated data from the spread sheet[1], and the NPV and IRR analysis including the results for both actual and expected data. The values used can be explained as follows:

Example Furnace #7 (actual data including CER's reveue):

The actual cash flow including CER's revenues is the sum of actual average monthly (27 months) revenue of -95 900 R (as given in the aggregated results of the detailed monthly data[1]) multiplied with 12 to give annual cash flow of -1 150 802 R. The revenue from sales of CER's of 1 808 661 is then added to give the total annual cash flow of 657 859 R. The NPV for 10 years is calculated with a discount rate of 12% to give – 11 903 420 R. DNV was able to verify the calculated NPV and IRR values from the respective sources of data.

The actual IRR of furnace 7 is not shown since all cash flows are negative and hence no IRR can be calculated.

We sincerely hope that the Board accepts our above explanations.

Yours faithfully
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Michael Lehmann
Technical Director
International Climate Change Service

Trine Kopperud
Project manager

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