Response to the request for review for the CDM project activity
"N_2O Decomposition Project of PetroChina Company Limited Liaoyang PetroChemical Company"
with the reference number 1238

Attention: Kai-Uwe Bamni Schmidt
Manager, CDM Section
CDM Executive Board to Kyoto Protocol

November 11, 2007

Dear Kai-Uwe Bamni Schmidt,
We were informed that our project "N_2O Decomposition Project of PetroChina Company Limited Liaoyang PetroChemical Company (Ref. no.1238)" was requested for review by CDM Executive Board on the 29 October, 2007. As required by the Board, we would like to answer the questions, clarify the issues and provide additional information, as required by the Board, as follows. Please forward our responses, clarifications and additional information to the Board.

Issue 1 raised:
The PP shall further clarify which is the production capacity of the adipic acid production plant of LYPC, "constructed in the end of 1981 with two technological transformations reaching the installed capacity 140,000 tons per year in 2004. To the end of 2004, the maximum adipic acid production capacity is 477 tons per day." In addition, the DOE shall further clarify how the data related to the production record of the plant was checked and validated and how they have assessed and validated when the installed capacity of the adipic acid plant used to calculate and claim emissions reductions was established.

Our clarifications:
The LYPC adipic acid plant was constructed in 1981. Following plant modifications, the plant had an installed production capacity of 140,000 tons by the end of 2004. However, based on production records from 2004, the plant has achieved a production level of up to 477 tons per day, which is equivalent to 174,105 tons per year.

The PP has provided the DOE with supporting documentation for validation, which is listed in Section 3.1 of the Validation Report: Feasibility Study for Liaoyang Petrochemical Company N_2O Emissions Reduction CDM Project (/2/); Production Capacity Design Document for Adipic Acid Production of PetroChina Company Limited Liaoyang Petrochemical Company (/8/); PetroChina Company Limited Liaoyang Petrochemical Company CDM Project Design Document (/1/). Based on this documentation, the DOE was able to validate that by the end of 2004 the plant had an installed production capacity of 140,000 tons per year. DNV was further able to validate the plant's 2004 maximum achieved daily production level of 477 tons per day *(attached as Annex A hereto)*, therefore, the maximum production capacity shall be 174,105 tons per year.

Issue 2 raised:
The PP states in the PDD (page 8 of 51) that "No public funding from Parties included in Annex I is likely to be involved". Further clarification is required. In addition, the DOE shall further explain on how they assessed and validated the evidence related to the issue of ODA.

Our clarifications:
The PP apologizes for the lack of clarity in the PDD. The proposed project does not involve any type of public funding from Parties included in Annex I, and thus it does not involve any funds that could result in diversion of Official Development Assistance (ODA).

The two Annex I Project Participants included in Annex 1 to the PDD are private entities. Additional evidence that no public funds were provided to either one of these two Project Participants with respect to the proposed project activity has been provided to the DOE. This additional evidence is included as *Annex B* .of this response.

Therefore, no public funding from Parties included in Annex I is involved in the proposed project activity.

Issue 3 raised:
The PDD states that "Based on the data provided by BASF, the decomposition efficiency is 98.5%, the nondecomposed N_2O is 1.5%, and LYPC chooses 5% to estimate the non-decomposed N_2O out of conservation". The DOE shall further clarify on how they have assessed and validated the efficiency of the catalytic process for the decomposition of the N_2O by-product of adipic acid production on the basis of data from technology provider and industry standards.

Our clarifications:
The PP provided the DOE with the "Catalyst O3-81 Supply Contract for Liaoyang N_2O Abatement Plant, CPM06-SND09-05GM" (listed in Section 3.1 of the Validation Report as document number/19/), whereby BASF guarantees to the project participant a minimum decomposition efficiency of 95%. This guaranteed minimum decomposition efficiency is contemplated in Clause 2.4.2 of the above-mentioned supply contract *(attached as Annex C hereto)*.

Furthermore, the PP provided to the DOE the technical data and feedback from BASF, supporting the claim that the catalyst is capable of achieving a decomposition of rate 98.5% *(attached as Annex D hereto)*. For the purpose of estimating emission reductions, the project participant chooses the lowest decomposition efficiency, 95%, as guaranteed by BASF, which is a very conservative assumption.

Issue 4 raised:
Further substantiation of additionality and CDM consideration is required.

Our responses:
The PP has demonstrated additionality, in accordance with the requirements of the methodology, as follows:

(1) There is no Chinese governmental law/regulation on either national or local level that restricts N_2O emissions; (2) The project activity is not common practice in the relevant sector and region, as existing similar activities in non-Annex I countries were only pursued as CDM project activities or as part of voluntary world-wide GHG mitigation initiatives; (3) In the absence of the CDM incentive the project activity will not be commercially viable even when taking into account the market value of by-products. The PP demonstrated that due to the high capital and operational cost of the N_2O decomposition facility and the negligible non-CDM economic benefit provided by the steam generated in the decomposition process the project would not be undertaken in the absence of the CDM incentive.

PP has substantiated that the project activity is not common practice by making reference to the most recent publication from a leading source of information for this industry, Chemical Week (Chemical Week (2003): Adipic acid, April 23. Vol. 165. Iss. 15.). Chemical Week is part of Chemical Business Media, the world's leading provider of technical and business information to the chemical and process industries.

Moreover, the PP has substantiated that the project activity would not be commercially viable without the CDM incentive by applying a benchmark analysis (Option III of the additionality test in AM0021), which demonstrates that the NPV is significantly less than zero at a range of discount rates (0%, 5%, 10%, 15%). This benchmark analysis encompasses the range of discount rates applied by financial institutions in China of 2 to 4%.

All supporting documentation has been provided to the DOE for validation.

Issue 5 raised:
The DOE shall further clarify how they have validated that the project activity is not common practice in relevant sector and region, as:

a. **The data source for the information of four existing facilities in Non-Annex I countries is the Chemical Week, published more than four years ago (Adipic acid, April 23, 2003: Vol.165. Iss. 15). In addition, the DOE shall further clarify how they have checked the reliability of the information source.**

b. **One of the existing four plants, a plant in Singapore, which was constructed in 1997 and is operated by INVISTA abates the N_2O emissions resulting from the adipic acid production.**

Our clarifications:
Although this question has been addressed to the DOE, the PP would like to provide further clarification, as follows:

With regard to 5.a: Chemical Week is a valid source for this industry. Chemical Week is part of Chemical Business Media, the world's leading provider of technical and business information to the chemical and process industries. The article referenced in the PDD (Adipic acid, April 23, 2003: Vol.165. Iss. 15) is the most recent publication by this source on this topic.

With regard to 5.b: As explained in the PDD, the four existing adipic acid plants in non-Annex I countries have either carried out N_2O decomposition as CDM project activities or as part of a voluntary world-wide GHG mitigation

initiative. In fact, three of them are CDM project activities, only one of which is located in China. In the fourth plant, located in Singapore, N_2O emission reductions were pursued by INVISTA in 1997 as part of its worldwide voluntary GHG mitigation initiative, which was initiated in 1991. At that point in time the CDM was not yet established. Therefore, the proposed project activity is not common practice in relevant sector and region.

Issue 6 raised:
The DOE shall further clarify their statement that "The Parties involved are China as a host country and UK as a host I country" and "The approval documents from the DNA of England are not received" in their CDM Validation Protocol (Appendix A).

The DOE will reply to this directly.

Issue 7 raised:
The DOE shall further clarify their statement that "The operational cost is stated to be "taken out of convenient"." in their CDM Validation Protocol (Appendix A).

Our clarifications:
For the purpose of the benchmark analysis, the best available pre-installation information was used to estimate annual operational costs.

Technology provider's data was used as the project activity has yet to be implemented, and thus there is no actual consumption data available. Furthermore, plant data from 2004 was used because this is the data that pertains to the existing installed capacity by the end of 2004. The annual operational costs were estimated using technology provider's consumption data and data from 2004 used for the benchmark analysis because, pre-installation, this is the best available information.

All assumptions and relevant data were provided to the DOE for validation as listed in Section 3.1 of the validation report: "Catalyst O3-81 Supply Contract for Liaoyang N_2O Abatement Plant, CPM06-SND09-05GM" (/19/), "AERZEN ASIA PTE LTD, Energy consumption calculation" (/14/), "STEULER, Material and Mass Balance N_2O Abatement system LYPC" (/17/), and "China Petrochemical Engineering Liaoyang Division, Supplement statement for the parameter value used in NPV calculation", (/15/).

Issue 8 raised:
The MK Calculation Sheet.xls, provided in Appendix 1 - MK Cal sheet should be further clarified in order to provide clear variable definition for analysis.

Our clarifications:
We have updated the MK Cal sheet to make the variable definition clear (attached as Annex E hereto).

Issue 9 raised:
The DOE shall further clarify how they have verified, assessed and validated data, documentation and spreadsheets that aim to demonstrate the additionality of the project activity and in particular those related to benchmark analysis. The attached spreadsheet (MK Calculation Sheet.xls) does not suffice to fully explain the financial circumstances related to the proposed project activity.

Our clarifications:
Although the question is addressed to the DOE, the PP would like to further clarify, as follows:

The MK Cal sheet and all supporting documentation have been made available to the DOE for validation. All the relevant data and assumptions used to carry out the benchmark analysis were made available to the DOE during the onsite visit. The PP also provided information on the financial circumstances of the proposed project activity to the DOE during validation. This additional information is referenced in Section 3.1 of the validation report ("China Petrochemical Engineering Liaoyang Division, Supplement statement for the parameter value used in NPV calculation"/15/). This document provided further information on the total investment, electricity consumption, catalyst cost, maintenance cost, and the amount and unit price for steam generated by the project activity.

Moreover, the PP has revised the MK Cal sheet (attached as Annex E hereto) to provide more clarity on the data and assumptions used to demonstrate additionality.

Issue 10 raised:

The discount rate applied in the NPV calculation is not what was quoted in the PDD. The DOE should therefore further substantiate the statement that "figures presented in the PDD for the calculation for NPV has been provided for verification … and are found to be correct".

Our clarifications:
Although the question is addressed to the DOE, the PP would like to further clarify, as follows:

The benchmark analysis was carried out considering 4 scenarios with different discount rates (0%, 5%, 10%, and 15%). Although most financial institutions in China use a discount rate ranging from 2%-4%, the benchmark analysis encompasses a wider range to further demonstrate that the project activity is snot commercially viable at higher discount rates. The PP acknowledges the confusion created by not using or making reference to the range used by Chinese financial institutions in the NPV calculations provided in the MK Cal sheet submitted along with the PDD. The MK Cal sheet has been revised (*attached as Annex E hereto*) to incorporate other scenarios that reflect discount rates of 2% and 4%.

Issue 11 raised:
The DOE shall further clarify if according to their systems implementation and qualification requirements it is technically sound and appropriate that the validation team leader has no specific competencies in the industry to which the project activity being validated belongs, according to their certificate of competence in Appendix B of their Validation Report.

The DOE will reply to this directly.

Issue 12 raised:
The step-by-step application of the methodology for calculating emissions should be documented in a transparent manner to show how the formulae were applied.

Our responses:
As requested, a step-by-step application of the methodology for calculating the emission reductions in line with Section B.6.3 and Section B.7.2 of the PDD is provided as part of this response *(attached as Annex F hereto).*

Yours sincerely,
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