



VALIDATION REPORT

Zhang Jiagang waste heat
recovery from sulphuric acid
production for electricity
generation project
in
China

REPORT No. 2007-0317

REVISION No. 03



VALIDATION REPORT

Date of first issue: 2007-02-06	Project No.: 63603131	DET NORSKE VERITAS CERTIFICATION AS Veritasveien 1 N-1322 Høvik Norway http://www.dnv.com
Approved by: Mari Grooss Viddal, Head of Approval and Service Centre, Norway	Organisational unit: Climate Change Services	
Client: Trading Emissions PLC	Client ref.: Des Godson	

Project Name: Zhang Jiagang waste heat recovery from sulphuric acid production for electricity generation project
Country: China
Methodology: ACM0004
Version: 02
GHG reducing Measure/Technology: Waste Heat for Power Generation
ER estimate: The annual emission reductions are 273 328 tCO₂e during a ten years fixed crediting period.
Size
☒ Large Scale
☐ Small Scale
Validation Phases:
☒ Desk Review
☒ Follow up interviews
☒ Resolution of outstanding issues
Validation Status
☐ Corrective Actions Requested
☐ Clarifications Requested
☒ Full Approval and submission for registration
☐ Rejected

In summary, it is DNV's opinion that the "Zhang Jiagang waste heat recovery from sulphuric acid production for electricity generation project" in China, as described in the PDD of 11 November 2008, meets all relevant UNFCCC requirements for the CDM and all relevant host Party criteria and correctly applies the baseline and monitoring methodology ACM0004. DNV thus requests the registration of the project as a CDM project activity.

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Report title: Zhang Jiagang waste heat recovery from sulphuric acid production for electricity generation project		
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Key words:

Climate Change
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 Validation
 Clean Development Mechanism

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Abbreviations

BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CL	Clarification request
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
CSAIA	China Sulfuric Acid Industry Association
DNV	Det Norske Veritas
DNA	Designated National Authority
DRC	Development and Reform Commission
ECPG	East China power grid
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
LOA	Letter of Approval.
MP	Monitoring Plan
NGO	Non-governmental Organisation
ODA	Official Development Assistance
OM	Operating Margin
PDD	Project Design Document
UNFCCC	United Nations Framework Convention on Climate Change
SCE	Standard coal equivalent
TFC	Two Lions (Zhangjiagang) Fine Chemicals Co., Ltd.



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1 EXECUTIVE SUMMARY – VALIDATION OPINION

Det Norske Veritas Certification AS (DNV) has performed a validation of the “Zhang Jiagang waste heat recovery from sulphuric acid production for electricity generation project” in China. The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism and host Party criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The review of the project design documentation and the subsequent follow-up interviews have provided DNV with sufficient evidence to determine the fulfilment of stated criteria.

The host Party is China and the Annex I Party is the United Kingdom. Both Parties fulfil the participation criteria and have approved the project and authorized the project participants. The DNA of China confirmed that the project assists in achieving sustainable development.

The project correctly applies ACM0004 “Consolidated baseline methodology for waste gas and/or heat and/or pressure for power generation”, version 2.

By utilizing waste heat to generate electricity, thus displacing grid electricity, the project results in reductions of CO₂ emissions that are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

The total emission reductions from the project are estimated to be on the average 273 328 tCO₂e per year over the selected 10 year crediting period. The emission reduction forecast has been checked and it is deemed likely that the stated amount may be achieved given that the underlying assumptions do not change.

Adequate training and monitoring procedures have been implemented.

In summary, it is DNV’s opinion that the “Zhang Jiagang waste heat recovery from sulphuric acid production for electricity generation project” in China, as described in the PDD of 11 November, 2008, meets all relevant UNFCCC requirements for the CDM and all relevant host Party criteria and correctly applies the baseline and monitoring methodology ACM0004, version 2. DNV thus requests the registration of the project as a CDM project activity.



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2 INTRODUCTION

Trading Emissions PLC has commissioned Det Norske Veritas Certification AS (DNV) to perform a validation of the “Zhang Jiagang waste heat recovery from sulphuric acid production for electricity generation project” in China (hereafter called “the project”). This report summarises the findings of the validation of the project, performed on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures, and the subsequent decisions by the CDM Executive Board.

2.1 Objective

The purpose of a validation is to have an independent third party assess the project design. In particular, the project's baseline, monitoring plan, and the project's compliance with relevant UNFCCC and host Party criteria are validated in order to confirm that the project design, as documented, is sound and reasonable and meets the identified criteria. Validation is a requirement for all CDM projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).

2.2 Scope

The validation scope is defined as an independent and objective review of the project design document (PDD). The PDD is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodology ACM0004. The validation team has, based on the recommendations in the Validation and Verification Manual /16/ employed a risk-based approach, focusing on the identification of significant risks for project implementation and the generation of CERs.

The validation is not meant to provide any consulting towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design.

3 METHODOLOGY

The validation consisted of the following three phases:

- I a desk review of the project design documents
- II follow-up interviews with project stakeholders
- III the resolution of outstanding issues and the issuance of the final validation report and opinion.

The following sections outline each step in more detail.



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3.1 Desk Review of the Project Design Documentation

The following table outlines the documentation reviewed during the validation:

- /1/ Shanghai Yangtze Delta Investment Consultancy Co., Ltd., Project Design Document for the “Zhang Jiagang waste heat recovery from sulphuric acid production for electricity generation project”, Version 01, 25 September 2006, and Version 05, 11 November 2008.
- /2/ Letter of Approval issued by DNA of China – 13 December 2006.
- /3/ Letter of Approval issued by DNA of UK – 12 January 2007.
- /4/ The feasibility study report of Zhang Jiagang waste heat recovery from sulphuric acid production for electricity generation project in December 2003 and the approval letter by Economic and Trading Commission of Jiangsu Province on 6 January 2005.
- /5/ The EIA of the Zhang Jiagang waste heat recovery from sulphuric acid production for electricity generation project in July 2004 and the approval letter by the Environmental Protection Bureau of Jiangsu Province on 2 November 2004.
- /6/ The Approval of Environmental Impact Assessment and Environmental Protection Plan of Jiangsu Yangtze River Chemical Industry district by the Environmental Protection Bureau of Jiangsu Province on 27 August 2003.
- /7/ The notebook with the content of the meeting between Monsanto Enviro-chem System Inc. and Two Lions (Zhangjiagang) Fine Chemicals Co., Ltd. provided by the General Manager Mr. Yuan Yafei dated 9 May 2003.
- /8/ The emails between Patrick Michael Ritschel of Monsanto Enviro-chem System Inc. and Patrick Vizzone of Dutch Rabobank about the CDM corporation of the project dated July 2003 to April 2004.
- /9/ The CDM Project Idea Note (PIN) to the Two Lions (Zhangjiagang) Fine Chemicals Co., Ltd. provided by the Monsanto Enviro-chem System Inc. dated 22 December 2003.
- /10/ The construction permission, 7 May 2004.
- /11/ The email between MONSANTO Enviro-Chem systems of China and Rabobank to discuss about CDM application issues of Twolions Project on 28 October 2004.
- /12/ Clarification about the CDM application processes for this project by Monsanto Enviro-Chem (Shanghai) Co., Ltd and Monsanto Enviro-Chem Co., Ltd
- /13/ Commission for CDM consulting signed between Twolions Company and SYDIC on 17 October 2005.
- /14/ CDM consulting agreement signed between Twolions Company and SYDIC on 10 May 2006.
- /15/ China Sulfuric Acid Industrial Association, Major Companies to Utilize the Recovered Waste Heat in China Sulfuric Acid Industry for Year 2004, 7 May 2004.
- /16/ International Emission Trading Association (IETA) & the World Bank’s Prototype Carbon Fund (PCF), *Validation and Verification Manual*.
<http://www.ieta.org/ieta/www/pages/index.php?IdSitePage=200>
- /17/ CDM Executive Board: ACM0004 “Consolidated baseline methodology for waste gas and/or heat and/or pressure for power generation” version 02 of 3 March 2006.



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- /18/ CDM Executive Board: ACM0002 “Consolidated methodology for grid-connected electricity generation from renewable sources” version 06 of 19 May 2006.
- /19/ CDM Executive Board: Tool for the demonstration and assessment of additionality, version 03
- /20/ China Electric Power Yearbooks 2004, 2005, 2006.
- /21/ China Energy statistics Yearbooks 2004, 2005, 2006.
- /22/ Chinese National Standard GB2589-81
- /23/ CDM Executive Board: Guidance for request for deviation titled “Application of AM0005 and AMS-I.D in China” (<http://cdm.unfccc.int/Projects/Deviations>)
- /24/ Revised 2006 IPCC Guidelines for National Greenhouse Gas Inventories
- /25/ China NDRC and the National Construction Committee, Economic Evaluation Code and Parameter for Construction Project, Version 03, 2006.
- /26/ China Sulfuric Acid Industry Association (CSAIA), Trend Analysis for Investment Return in Sulfuric Acid Industry, February 10, 2004.
- /27/ China Sulfuric Acid Industry Association (CSAIA), Clarifications about the classification on the production scale of sulphuric acid facilities and waste heat recovery and utilization in China”, August 10. 2008.
- /28/ Loan Agreement between TFC and China Bank of Communications dated 30 June 2004.
- /29/ The letter for electricity generation by the project and electricity consumption by the project owner for year 2005 - 2008, notarized by Jiangsu Zhangjiagan Grid Company.
- /30/ The notice of measures for electricity dispatch, issued by China State Council, under http://www.ndrc.gov.cn/zcfb/zcfbqt/2007qita/t20070828_156042.htm (official website of National Development & reform Commission)
- /31/ The business license of TFC to show that TFC’s business include the sulphuric acid production and Caustic Soda production.
A clarification letter to confirm that TFC have sulphuric acid production and Ion Exchange membrane Caustic Soda production facilities at same site, Zhangjiagan City Economic Development Bureau.
- /32/ cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File1364.pdf (Grid determination)
- /33/ cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File1365.pdf (BM calculation)
- /34/ cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File1358.xls (OM calculation)
- /35/ NDRC, Requirement for construction of coal power plant under 100 MW to be forbidden within the connected area. To be found at
<http://info.westpower.com.cn/cgi-bin/Ginfo.dll?DispLaw&w=westpower&ac=&gr=6067&pr=0&lid=15812>
- /36/ IRR analysis for this project in December 2003.
- /37/ Electricity tariff for this project approved by Price Bureau of Jiangsu province on 25 April 2005.



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3.2 Follow-up Interviews with Project Stakeholders

	Date	Name	Organization	Topic
/38/	2007-01-18	Mr. Yuan Yafei, General Manager Mr. Chen Ziling, Engineer Mr. Hua Huidong Engineer Mr. Yuan Dong, Engineer	Two Lions (Zhangjiagang) Fine Chemicals Co., Ltd.	- Project background information. - Project technology, operation, maintenance and monitoring capability. - Project additionality. - Project monitoring and management plan. - Project approval status (incl. EIA approval, CDM project approval status) - Stakeholder consultation process.
/39/	2007-01-18	Mr. Tao Kanghua Mr. Xu Yong	Shanghai Yangtze Delta Investment Consultancy Co., Ltd.	- Applicability of selected methodology. - Baseline determination. - Emission reductions calculation. - Emission reduction monitoring plan.

The main changes between the version of the PDD published for the 30 days stakeholder commenting period and the final version of the PDD submitted for registration are as follows:

- Inclusion of more detailed information on basic finance parameters of the project.
- Justification for the benchmark selection.
- Inclusion of more detailed information on barrier assessment.
- Some minor changes in the relevant part in order to consistencies the clarifications and corrections made and reflect current situation of project activity,
- Change of CEF calculation for the grid based on the most current available data.
- Revision of emission reductions estimation.
- Change of project crediting start date.
- Changes related to the CARs and CLs identified in DNV's draft validation report (refer to Table 3 in the validation protocol in Appendix A to this report).

3.3 Resolution of Outstanding Issues

The objective of this phase of the validation was to resolve any outstanding issues which needed to be clarified prior to DNV's positive conclusion on the project design. In order to



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ensure transparency a validation protocol was customised for the project. The protocol shows in a transparent manner the criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

- It organises, details and clarifies the requirements a CDM project is expected to meet;
- It ensures a transparent validation process where the validator will document how a particular requirement has been validated and the result of the validation.

The validation protocol consists of three tables. The different columns in these tables are described in the figure below. The completed validation protocol for the “Zhang Jiagang waste heat recovery from sulphuric acid production for electricity generation project” is enclosed in Appendix A to this report.

Findings established during the validation can either be seen as a non-fulfilment of CDM criteria or where a risk to the fulfilment of project objectives is identified. Corrective action requests (CAR) are issued, where:

- i) mistakes have been made with a direct influence on project results;
- ii) CDM and/or methodology specific requirements have not been met; or
- iii) there is a risk that the project would not be accepted as a CDM project or that emission reductions will not be certified.

A request for clarification (CL) may be used where additional information is needed to fully clarify an issue.

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Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities				
Requirement	Reference	Conclusion		
The requirements the project must meet.	Gives reference to the legislation or agreement where the requirement is found.	This is either acceptable based on evidence provided (OK), a Corrective Action Request (CAR) of risk or non-compliance with stated requirements or a request for Clarification (CL) where further clarifications are needed.		

Validation Protocol Table 2: Requirement checklist				
Checklist Question	Reference	Means of verification (MoV)	Comment	Draft and/or Final Conclusion
The various requirements in Table 2 are linked to checklist questions the project should meet. The checklist is organised in different sections, following the logic of the large-scale PDD template, version 03 - in effect as of: 28 July 2006. Each section is then further sub-divided.	Gives reference to documents where the answer to the checklist question or item is found.	Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.	The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.	This is either acceptable based on evidence provided (OK), or a corrective action request (CAR) due to non-compliance with the checklist question (See below). A request for clarification (CL) is used when the validation team has identified a need for further clarification.

Validation Protocol Table 3: Resolution of Corrective Action and Clarification Requests			
Draft report clarifications and corrective action requests	Ref. to checklist question in table 2	Summary of project owner response	Validation conclusion
If the conclusions from the draft Validation are either a CAR or a CL, these should be listed in this section.	Reference to the checklist question number in Table 2 where the CAR or CL is explained.	The responses given by the project participants during the communications with the validation team should be summarised in this section.	This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".

Figure 1: Validation protocol tables



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3.4 Internal Quality Control

The draft validation report including the initial validation findings underwent a technical review before being submitted to the project participants. The final validation report underwent another technical review before requesting registration of the project activity. The technical reviews were performed by a technical reviewer qualified in accordance with DNV's qualification scheme for CDM validation and verification.

3.5 Validation Team

Role/Qualification	Last Name	First Name	Country
Team leader / CDM validator	Yang	Weidong	China
CDM validator	Yue	Mindy	China
CDM validator	Tang	Wilson	China
GHG auditor	Kuo	Tim	China
Sector expert	Brinks	Hendrik	Norway
Technical reviewer(applicant)	Flagstad	Ole	Norway
Technical reviewer	Lehmann	Michael	Norway

The qualification of each individual validation team member is detailed in Appendix B to this report.



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4 VALIDATION FINDINGS

The findings of the validation are stated in the following sections. The validation criteria (requirements), the means of verification and the results from validating the identified criteria are documented in more detail in the validation protocol in Appendix A.

The final validation findings relate to the project design as documented and described in the revised and resubmitted project design documentation dated 20 November 2007.

4.1 Participation Requirements

The project participants are TWO LIONS (ZHANGJIAGANG) FINE CHEMICALS CO., LTD of China and Trading Emissions PLC of the United Kingdom. The host Party China and the participating Annex I Party the United Kingdom meet the requirements to participate in the CDM.

The DNA of China has issued a Letter of Approval (LoA) /2/ on 13 December 2006, authorizing TWO LIONS (ZHANGJIAGANG) FINE CHEMICALS CO., LTD as a project participant and confirming that the project assists in achieving sustainable development.

The DNA of United Kingdom has issued a LoA /3/ on 12 January 2007 authorizing Trading Emissions PLC as a project participant.

The project does not involve public funding, and the validation did not reveal any information that indicates that the project can be seen as a diversion of official development assistance (ODA) funding towards China.

4.2 Project Design

The project consists of the construction of waste heat recovery based power generation using the waste heat produced in the production process of sulfuric acid at TWO LIONS (ZHANGJIAGANG) FINE CHEMICALS CO., LTD located in the Jiangsu Province, China. The project involves installation of a Monsanto Heat Recovery System (HRS) and a Siemens condensing turbine and power generation units of capacity of 50MW - both technologies are the first applications in Chinese sulfuric acid industry. The project has been approved by responsible economic and trading commissions.

The expected operational lifetime of the project activity is 20 years. A fixed crediting period of 10 years has been chosen for the project, expecting to start from 1 June 2008 or the date of registration, whichever is later. The annual net electricity exported to the grid is 302 120 MWh and the annual average emission reductions are estimated to be 273 328 tCO₂e per year over a fixed ten-year crediting period.

The project is expected to contribute to the sustainable development of China through improved environmental protection, facilitating the technology development of waste heat recovery in the chemical industry as well as increased employment opportunities.

4.3 Baseline Determination

The project applies the approved baseline methodology ACM0004 (version 02), titled “Consolidated methodology for waste gas and/or heat and/or pressure for power generation”.

The application of the baseline methodology is justified as follows:

- The project displaces electricity generation in the East China power grid (ECPG)



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which is dominated by coal fired power plants.

- No fuel switch is done in the process, where the waste heat is produced, after the implementation of the project activity.

It is deemed likely that the east China power grid will continue to be dominated by thermal power plant in the future due to the local availability of low-cost fossil fuel reserves and technologies in China and that renewable resource additions will not have significant effects on the mix of the east China grid during the first crediting period.

The spatial extent of the project boundary comprises the waste heat sources, heat recovery and power generating equipment and the power plants connected physically to the East China grid including the Shanghai, Jiangsu, Zhejiang, Anhui and Fujian provincial grids to which the project is connected. This is in line with the delineation of grid boundaries as provided by the DNA of China. The defined project boundary is in line with ACM0004 version 02.

The possible alternative scenarios in absence of the CDM project activity would be:

- 1) The proposed project activity not undertaken as a CDM project activity;
- 2) Continuation of equivalent import of electricity from the east China grid;
- 3) New fossil fuel (coal/gas/diesel) based captive power plant;
- 4) New hydro/wind power captive power plant;
- 5) Other use of the waste heat.

The proposed project activity not undertaken as a CDM project activity is not a realistic and credible alternative baseline as discussed in the analysis below. The construction of a new fossil fuel based captive power plant does not comply with Chinese regulation as thermal power plants with a capacity less than 100 MW are prohibited to be built in areas covered by large grids such as provincial grids /35/. There are no renewable resources for the project entity to construct such plant on site, thus new hydro/wind power captive power plant is not representing a realistic baseline. Furthermore, it has been confirmed that there is no heat demand in the company itself that can take advantage of the available heat. As the project activity is located in Jiangsu Yangtze River Chemical Industry district, the Approval of Environmental Impact Assessment and Environmental Protection Plan of Jiangsu Yangtze River Chemical Industry district /6/ reads: The heat or steam used in the district must be supplied by the thermal electricity plant of the Free Trade Zone. Hence, the baseline scenario is identified as continuation of the current practice of importing an equivalent amount of electricity from the east China grid.

In the baseline scenario the electricity delivered from the project activity to the grid would have been generated by fossil fuels grid-connected power plants and by the addition of new generation sources. The baseline grid emission factor has been determined as per ACM0002 (version 06) using the combined margin (CM) based on the weighted average of the operating margin (OM) emission factor and the build margin (BM) emission factor. The weights are set to be 50%, the default values stipulated by ACM0002 (version 06). The applied values are given in section 4.5.1 with reference to the data sets used for the calculations.

The baseline determination is transparent and reasonable.



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The system boundaries are presented in the following table:

	GHGs involved	Description
Baseline emissions	CO ₂	Emissions equivalent to the same quantity of electricity generated by the project activity.
Project emissions		No emission
Leakage		No leakage

4.4 Additionality

Early in 2003, Monsanto Enviro-chem System Inc. introduced CDM to Two Lions (Zhangjiagang) Fine Chemicals Co., Ltd. and they discussed about applying for CDM registration. The notebook /7/ with the content of the meeting between Monsanto Enviro-chem System Inc. and Two Lions (Zhangjiagang) Fine Chemicals Co., Ltd. provided by the General Manager Mr. Yuan Yafei dated 9 May 2003 has been verified by DNV. It noted that the development of CDM would be provided by Monsanto Enviro-chem System Inc. The emails /8/ between Patrick Michael Ritschel of Monsanto Enviro-chem System Inc. and Patrick Vizzone of Dutch Rabobank about the CDM incorporation of the project dated July 2003 to April 2004 have also been provided and verified.

On 22 December 2003, Monsanto Enviro-chem System Inc. provided the Project Idea Note (PIN) /9/ to the Two Lions (Zhangjiagang) Fine Chemicals Co., Ltd. Considering the impact of CDM to the project, the project obtained the construction permission on 7 May 2004 /10/. The PIN and the evidence of the project start date have also been verified by DNV. It shows that the incentive from the CDM was seriously considered in the decision to proceed with the project activity as income from CERs was estimated and found necessary to alleviate the risks of the heat recovery system (HRS).

Nevertheless, DNV has in this case found it necessary to assess further why there was a delay for two years until finally starting the validation process. The following explanation for the delay in starting validation was given and DNV verified supporting documents for these explanations:

- From 2003 to 2005, TFC asked Monsanto Enviro-chem System Inc. to help them apply for CDM and Monsanto Enviro-chem System Inc. contacted Rabobank as CER buyer. However, since the CER price quoted by Rabobank and the PDD didn't meet the standards of the Chinese DNA, Monsanto Enviro-chem System Inc. decided to stop the cooperation with the Rabobank Group and looked for a domestic professional CDM consulting company to continue the CDM development /12/.
- On 17 October 2005, with the recommendation of Monsanto Enviro-chem System Inc., TFC signed a commission /13/ with SYDIC for CDM consulting. On 10 May 2006, TFC eventually signed a CDM consulting agreement /14/ with SYDIC.

The starting date of the project activity is 7 May 2004 (the day on which the construction permission was obtained) /10/. It is DNV's opinion that this is correctly considered the



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earliest of the dates at which the implementation or construction or real action of the project activity began.

The additionality of the project has been established using the “*Tool for the demonstration and assessment of additionality*” approved by the CDM-EB.

Step 1: Identification of the alternatives to the project activity consistent with the current laws and regulations.

The alternatives identified for the project activity are,

- a) The proposed project activity not undertaken as a CDM project activity;
- b) Continuation of equivalent import of electricity from the ECPG;
- c) New fossil fuel (coal/gas/ diesel) based captive power plant;
- d) New hydro/ wind power captive power plant;
- e) Other use of the waste heat.

The proposed project activity not undertaken as a CDM project activity is not a realistic and credible alternative as discussed in the below analysis:

The construction of a new fossil fuel based captive power plant does not comply with the Chinese law as thermal power plants with a capacity below 100 MW are prohibited to be built in areas covered by large grids such as provincial grids.

There are no renewable resources for the project entity to construct such plant on site, thus new hydro/wind power captive power plant is not a deemed a realistic and credible alternative.

Furthermore, it has been verified on site that there is no demand for heating for other facilities of Two Lions (Zhangjiagang) Fine Chemicals Co., Ltd. (TFC), and no heat can be supplied to other nearby companies because as per the *Approval of Environmental Impact Assessment and Environmental Protection Plan of Jiangsu Yangtze River Chemical Industry district*, the heat or steam used in the district must be supplied by the thermal electricity plant of the Free Trade Zone.

Provided the above, the only realistic and credible alternative for the project activity is continuation of equivalent import of electricity from the ECPG.

Step 2: Investment analysis.

Benchmark analysis (Option III) is justified to conduct the investment analysis.

- The selection of benchmark - An equity IRR of 15% is selected as benchmark for investments in fine chemical industry; DNV was able to confirm the benchmark is selected properly as demonstrated below:
 - ✓ In China, China NDRC and the National Construction Committee are the authorities to assess and determine the IRR benchmark for every sector. According to the reference book /25/ written by these two governmental departments, equity IRR of 15% is selected as benchmark for investments in fine chemical industry; this selection conforms to the guidelines in the reference “when a project owner invests in a project with key characteristics of another sector rather than its own core business, and has little experience of these characteristics and the project risk, the sectoral benchmark IRR of its own core business will be applied” /25/.
 - ✓ The appropriateness of this benchmark is also confirmed by a research report issued by the China Sulphuric Acid Industry Association (CSAIA) /26/. The report concluded that the internal rate of return (IRR) of investments in the sulphuric acid



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industry were higher than 15% during 2002-2003 and are expected to increase in the future. CSAIA further confirmed the appropriateness of this benchmark in another clarification letter /27/.

- ✓ Furthermore, the appropriateness of the selected benchmark was also confirmed in the Loan Agreement from the China Bank of Communications explicitly during the time of investment decision for the project /28/.
- ✓ The selection of the benchmark was also able to be justified as,
 - ✧ that the project is totally dependent upon the sulphuric acid market,
 - ✧ and as the generated electricity by the project is nearly equal to the electricity demand of the project owner /29/ /31/, though the actual processes are, the generated electricity needs to, as required by the government department /30/, be connected to the local electricity grid, an integral part of the regional grid, East China Power Grid, then, the project owner needs to purchase electricity from the electricity grid.
- The project IRR without CER revenues is 11.76 % /36/ which shows that the project is not financially attractive in absence of CDM benefits.
- In assessing the input values used in the investment and sensitivity analyses, DNV has followed a 4-step approach:

Step 1: Assessment of the sources of the input parameters used in the investment and sensitivity analyses:

a) All the input parameters used in the financial analysis are taken from the feasibility study report (FSR) developed in December 2003 by *Engineering Consulting Institute of Jiangsu Province* and approved on 6 January 2005 by the *Economic and Trading Commission of Jiangsu Province* /4/. The input parameters used in the financial analysis can thus be considered information provided by an independent and recognized source.

b) All the above input parameters were available at the time when the decision to proceed with the project was made (the start date of the project was 7 May 2004, (the day on which the construction permission was obtained) /10/.

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 and investment analysis with the parameters stated in the FSR and was able to confirm that the values applied are consistent with the value stated in the FSR.

Step 3: Assessment of the period of time between the finalization of the FSR and the investment decision:

The (FSR) was developed in December 2003 by *Engineering Consulting Institute of Jiangsu Province* PPA, thus only four months prior to the decision to proceed with the project activity (i.e. the start date of the project) which was on 7 May 2004. Thus it 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 parameters used in the financial analysis with the parameters used by other similar projects:



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The input parameters used in the financial analyses were compared with the data reported for other similar proposed CDM projects in the region, i.e. other waste heat recovery projects in China, by comparing investment costs per MW, electricity tariff, percentage of operation and maintenance costs relative to total investment costs. By additionally applying our sectoral competence, DNV was able to confirm that the input parameters used in the financial analysis are reasonable and adequately represent the economic situation of the project.

- The impact of variations in the total investment, electricity price and operation and maintenance costs on project IRR is considered in the sensitivity analysis. It shows that when the total investment, electricity price and O&M fee fluctuate within the range of $\pm 10\%$, the IRR for total investment will not reach the benchmark.
- The electricity tariff used in the IRR analysis (based on the data in the approved feasibility study) was 0.329 Yuan/KWh, the actual electricity tariff approved was 0.329 Yuan/kWh /37/. This demonstrates that the range of -10% and 10% used in the sensitivity analysis for electricity tariff is appropriate.
- When the total investment reduces 31%, the IRR of the project will reach the benchmark of 15%. However, the project is the first sulfuric acid plant with HRS in China and all the equipments had to be imported from USA. Moreover, given that there has been a general price increase in recent years, a reduction of the total investment by 31% is not likely to occur.
- When the O&M costs are reduced by 22%, the IRR of the project will reach the benchmark of 15%. As this is the first HRS project operated by the project owner, it is not likely that O&M costs will reduce by 22% (please also refer to the below barrier analysis).

Step 3: Barrier analysis.

Barrier analysis has been conducted as supplementary to the investment analysis.

- Technological barriers: The sulphuric acid production must be operated within a strict range of sulphuric acid concentration and temperature. Hence, there are risks and uncertainty with regard to whether the project will affect the sulphuric acid production and to control the waste heat recovery without affecting the sulphuric acid production requires well skilled operation staff. Monsanto Heat Recovery System (HRS) is a patented technology owned by Monsanto Enviro-chem System Inc. Skilled and experienced labour to operate and maintain the technology is lacking and training for the technology needs to be carried out during implementation of the proposed project.
- Furthermore, the project is the first in mainland China to use the Monsanto HRS technology and equipment, and there is thus a lack of operation experiences.

The barriers mentioned above do not prevent the alternative that electricity will continue to be supplied by the east China power grid.

With the CDM revenue, the project developer can invite experts from abroad to train the local engineers, and to recruit specialist to work for the project. Thus, the operation risk can be reduced and the successful operation can be ensured.

Step 4: Common practice analysis.



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In the common practice analysis, facilities with similar sulfuric acid production capacities in China are compared. The essential distinctions between TFC and other facilities are:

- 1) Some other facilities mainly produce fertilizers, and they need great amount of heat. Hence, these facilities recover high and middle temperature waste heat from the sulfuric acid production lines, mainly to supply steam, while power generation is only secondary. TFC's core business is the sulfuric acid production, where there is no heat demand. Hence, TFC will utilize HRS to recover the waste heat to generate electricity, and the electricity will be exported to East China power grid.
- 2) Some other facilities use traditional heat recovery technology, and the traditional heat recovery technology utilizes ready and mature technologies. TFC uses HRS to recover waste heat, and HRS requires considerable stability of the sulfuric acid facility itself. The degree of difficulty for technology integration is rather high. HRS technology makes the whole sulphur acid facility a dynamic system.

The reference for the common practise analysis, a report by the China Sulfuric Acid Industrial Association /15/, has been verified by DNV. This report demonstrates that the project activity is not representing common practice in the country.

Given the above, it is sufficiently demonstrated that the project is not a likely baseline scenario, and that emission reductions from the project can hence be deemed additional.

4.5 Monitoring

The project applies the approved monitoring methodology, ACM0004 "Consolidated methodology for waste gas and/or heat and/or pressure for power generation". The selected monitoring methodology is justifiably applicable for the project activity as it involves power generation using waste heat for the ECPG and there is no change in the process from which the waste gas is generated.

The methodology ACM0004 version 02 requires monitoring of the following:

- Net electricity generation from the proposed project activity;
- Data needed to calculate carbon dioxide emissions from fossil fuel consumption due to the project activity;
- Data needed to recalculate the operating margin emission factor, if needed, based on the choice of the method to determine the operating margin (OM), consistent with "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" (ACM0002);
- Data needed to recalculate the build margin emission factor, if needed, consistent with "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" (ACM0002);
- Data needed to calculate the emissions factor of captive power generation.

There is no auxiliary fuel firing due to the project activity. The power generated by WHR will displace grid power imports. The emission factor of the regional grid is calculated ex-ante using the combined margin method as described in ACM0002 and based on the most recent information available is selected. Hence only the net electricity generation from the proposed project activity will be monitored.

The net electricity generation from the proposed project activity is the difference between the



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total electricity generated from the project and the auxiliary electricity consumption. Both are proposed to be measured continuously. An independent organization qualified for calibration of measurement equipment will be responsible for the regular calibration of the monitoring meters.

No leakage is considered under ACM0004 and has thus not been considered for the project.

4.5.1 Parameters determined ex-ante

The following parameters are determined *ex-ante* and were verified by DNV.

Data and Parameters	Unit	Value applied	Source of data used
Operating margin of China Central grid (OM)	tCO ₂ /MWh	0.9422	Calculated according to ACM0002 and most recent official data (2004 – 2006) /20/ /21/.
Build Margin of China Central grid (BM)	tCO ₂ /MWh	0.8672	Calculated according to ACM0002 and most recent official data for the years 2003 – 2005 /20/ /21/.
The combined margin of China Central grid	tCO ₂ /MWh	0.9047	Calculated according to ACM0002 and most recent official data for the years 2003 – 2005) /20/ /21/.

4.5.2 Parameters monitored ex-post

The following data and parameters need to be monitored; these are considered appropriate.

- Net electricity generation from the proposed project activity.

4.5.3 Management system and quality assurance

The monitoring plan provides for the collection and archiving of all relevant data:

Project emissions:

- No project emissions.

Baseline emissions:

- Net electricity generation from the proposed project activity.

Leakage:

- No leakage needs to be addressed in the project.

The above parameter will be monitored continuously.

The responsibility and authority for registration, monitoring, measurement and reporting activities have been properly addressed in the PDD. Also, DNV was able to verify that necessary procedures related to data handling, quality assurance and training of monitoring personnel have been appropriately implemented.



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4.6 Estimate of GHG Emissions

The emission reduction ER_y due to the project activity during the crediting period is the difference between the baseline emissions due to grid electricity generation with fossil fuels (BE_y) and project emissions (PE_y), as follows:

Baseline emissions

Baseline emission (BE_y in tCO_2) is computed as a function of the baseline emissions factor of the East China regional grid (EF_y in tCO_2/MWh) and the net electricity generated by the project activity which will substitute equivalent amount of power imported from the grid (EG_y in MWh).

The baseline emission factor for the project is determined ex-ante as a combined margin, consisting of the combination of the operating margin (OM) and build margin (BM) as described in ACM0002, version 06.

For the calculation of the OM emission factor, the simple OM emission factor calculation method is selected because low cost must run projects constitute less than 50% of the total grid generation and data is not available for applying the dispatch data analysis.

The aggregated generation and fuel consumption data are used due to less aggregated data are not available in the ECPG. Country specific data for net calorific value (NCV_i) of each type of fossil fuel, the IPCC 2006 default values for the oxidation factor of each type of fossil fuel and the total electricity delivered to the ECPG are selected and are deemed reasonable. Vintage data for the years 2003, 2004 and 2005 from China Energy Statistics Yearbooks and China Electric Power Yearbooks 2004-2006 /21/ /20/ editions are used for the operating margin calculation. These yearbooks were the most recent available at the time the PDD was submitted for validation. The OM is correctly evaluated to be $0.9422 tCO_2/MWh$.

Because plant specific fuel consumption and electricity generation data is not public available in China, EB guidance on the request for deviation titled “Application of AM0005 and AMS-I.D in China” has been applied as follows:

- The capacity additions from the years 2004 to 2005 /20/ is chosen and reached 21.55% of total installed capacity.
- The weight of installed capacity additions for thermal power plant is accounted for 92.53% of total installed capacity additions;
- There are no data available on the installed capacity additions for oil and gas power in ECPG. However, the China Energy Statistics Yearbook (2006) /21/ shows that the oil and gas used in CCPG is very small, and only for starting up systems of coal fired power plant, accounting for 3.29% of the total CO_2 emissions. The installed capacity addition for coal, oil and gas power plants being regarded as proportional with their CO_2 emissions percentage is thus deemed reasonable.
- The coal consumption efficiency of $343.33 gSCE/kWh$ is suggested by the DNA of China as the efficiency level of the best technology commercially available in China /33/. This corresponds to a 35.82% of power supply efficiency for coal-fired electricity generation. The gas and oil consumption efficiency of $258 gSCE/kWh$ is suggested by the DNA of China as the best technology commercially available in China /33/. This corresponds to a 47.67% of power supply efficiency for gas or oil-fired electricity generation. These efficiency levels were thus selected as proxy for estimating the BM.



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- The IPCC 2006 value of 25.8 tC/TJ and a carbon oxidation factor of 100% are used to calculate the BM emission coefficients.
- The BM is correctly calculated to be 0.8672 tCO₂/MWh

The calculation processes for both OM and BM are in line with those used by NDRC /33/ /34/.

The default weights 0.5 for OM and 0.5 for BM in the ACM0002 version 06 was used to calculate CM. The combined margin of 0.9047 tCO₂/MWh is fixed *ex-ante* for the entire first crediting period.

The project will provide enough waste heat, generating estimated electricity of 392 400 MWh annually and the internal electricity consumption of the project is estimated to be 90 279 MWh annually (detailed electricity consumptions for equipment included in the project are listed in the Annex 4 of PDD), resulting in a net electricity generation of 302 120 MWh annually. The baseline emissions is calculated to be 302 120 MWh/y X 0.9047 tCO₂/MWh = 273 328 tCO₂/y.

Project emission:

There is no auxiliary fuel utilization due to the project activity. Therefore, the project emissions are regarded as zero.

Leakage

In accordance with ACM0004, no leakage needs to be addressed in the project.

Emission reduction

$$ER_y = BE_y - PE_y = 273\,328 \text{ tCO}_2/\text{y}.$$

The GHG calculations are complete and transparent, and their accuracy has been verified.

Uncertainty

The major uncertainty related to the project's emission reductions is the amount of waste heat recovered in the future. Relative emissions are not likely to vary significantly, given that demand for sulfuric acid will remain at the same level for at least the crediting period.

4.7 Environmental Impacts

Environmental Impact Assessments (EIA) was conducted according to Chinese law & regulation. The potential environmental impacts have been sufficiently identified and are sufficiently documented in the PDD. No significant environmental impacts are envisaged in the project activity. The authorized environmental protection bureaus approved the EIA of the WHR project on 2 November 2004 /5/.



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4.8 Comments by Local Stakeholders

There are two stakeholder investigations of the projects. During 15 to 18 June in 2004, the project owner conducted the first interviews and received comments from local stakeholders. The second stakeholder investigations took place during 18 to 20 June in 2006, and it was regarded as review of the first investigation.

The following stakeholders were investigated:

1. Inhabitants of local community
2. Employees of TFC
3. Jiangsu Environmental Protection Bureau
4. Jiangsu Economy and Trade Committee
5. Zhangjigang Free Trade Zone Administration Committee
6. China Sulfuric Acid Industry Association

Interviews with questionnaire were conducted with local inhabitants door by door for their comments. Besides, TFC drafted project proposal to relative official departments to collect their comments. A summary of the comments was provided. No negative comments were received.

4.9 Comments by Parties, Stakeholders and NGOs

The PDD of 25 September 2006 was made publicly available on DNV's climate change website (http://www.dnv.com/focus/climate_change/projects/projectlist.asp?) and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 12 December 2006 to 10 January 2006.

No comment was received during this period.

APPENDIX A

CDM VALIDATION PROTOCOL

Table 1 Mandatory Requirements for Clean Development Mechanism (CDM) Project Activities

Requirement	Reference	Conclusion
About Parties		
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3.	Kyoto Protocol Art.12.2	OK
2. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC.	Kyoto Protocol Art.12.2.	OK
3. The project shall have the written approval of voluntary participation from the designated national authority of each Party involved.	Kyoto Protocol Art. 12.5a, CDM Modalities and Procedures §40a	~~CAR-1~~ OK
4. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof.	Kyoto Protocol Art. 12.2, CDM Modalities and Procedures §40a	~~CAR-1~~ OK
5. In case public funding from Parties included in Annex I is used for the project activity, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties.	Decision 17/CP.7, CDM Modalities and Procedures Appendix B, § 2	OK
6. Parties participating in the CDM shall designate a national authority for the CDM.	CDM Modalities and Procedures §29	OK
7. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol.	CDM Modalities §30/31a	OK
8. The participating Annex I Party's assigned amount shall have been calculated and recorded.	CDM Modalities and Procedures §31b	OK
9. The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7.	CDM Modalities and Procedures §31b	OK

Requirement	Reference	Conclusion
About additionality		
10. Reduction in GHG emissions shall be additional to any that would occur in the absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity.	Kyoto Protocol Art. 12.5c, CDM Modalities and Procedures §43	~~CL1~~ ~~CL2~~ ~~CL3~~ OK
About forecast emission reductions and environmental impacts		
11. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.	Kyoto Protocol Art. 12.5b	OK
For large-scale projects only		
12. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	CDM Modalities and Procedures §37c	OK
About stakeholder involvement		
13. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received.	CDM Modalities and Procedures §37b	OK
14. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available.	CDM Modalities and Procedures §40	OK
Other		
15. The baseline and monitoring methodology shall be previously approved by the CDM Executive Board.	CDM Modalities and Procedures §37e	OK

Requirement	Reference	Conclusion
16. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances.	CDM Modalities and Procedures §45c,d	OK
17. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure.	CDM Modalities and Procedures §47	OK
18. The project design document shall be in conformance with the UNFCCC CDM-PDD format.	CDM Modalities and Procedures Appendix B, EB Decision	OK
19. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP.	CDM Modalities and Procedures §37f	OK

Table 2 Requirements Checklist

CHECKLIST QUESTION					
* MoV = Means of Verification, DR= Document Review, I= Interview		Ref.	MoV*	COMMENTS	Draft Concl.
A. General Description of Project Activity					
<i>The project design is assessed.</i>					
A.1. Project Boundaries					
<i>Project Boundaries are the limits and borders defining the GHG emission reduction project.</i>					
A.1.1. Are the project's spatial boundaries (geographical) clearly defined?	/1/	DR I	Yes. The project is located in the Jiangsu Yangtze River International chemistry park, Zhangjiagang City, Jiangsu Province, China. The spatial extent of the project boundary comprises the waste heat sources, heat recovery and power generating equipment, and the power plants connected physically to the electricity grid that the proposed project activity will affect.		OK
A.1.2. Are the project's system boundaries (components and facilities used to mitigate GHGs) clearly defined?	/1/	DR I	The East China (regional) power grid (ECPG) is defined as the project system boundaries.		OK
A.2. Participation Requirements					
<i>Referring to Part A, Annex 1 and 2 of the PDD as well as the CDM glossary with respect to the terms Party, Letter of Approval, Authorization and Project Participant.</i>					
A.2.1. Which Parties and project participants are participating in the project?	/1/	DR I	The project participants are Two Lions (Zhangjiagang) Fine Chemicals Co., Ltd.,		OK

* MoV = Means of Verification, DR= Document Review, I= Interview

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			China and Trading Emissions PLC, the United Kingdom of Great Britain and Northern Ireland.		
A.2.2 Have all involved Parties provided a valid and complete letter of approval and have all private/public project participants been authorized by an involved Party?		I	The letters of approval from the DNA of China and the UK have not been obtained.	CAR-1	OK
A.2.3. Do all participating Parties fulfil the participation requirements as follows: - Ratification of the Kyoto Protocol - Voluntary participation - Designated a National Authority		I	China ratified the Kyoto Protocol on 30 August, 2002. The UK ratified the Kyoto Protocol on 31 May 2002. Both Parties participates in the CDM on a voluntary basis. Both Parties involved have designated national authorities for the CDM.		OK
A.2.4 Potential public funding for the project from Parties in Annex I shall not be a diversion of official development assistance.		DR I	The validation did not reveal any information that indicates that the project can be seen as a diversion of official development assistance (ODA) funding towards China.		OK
A.3. Technology to be employed <i>Validation of project technology focuses on the project engineering, choice of technology and competence/ maintenance needs. The validator should ensure that environmentally safe and sound technology and know-how is used.</i>					

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
A.3.1. Does the project design engineering reflect current good practices?	/1/	DR I	Yes. The project design engineering reflects current good practices in China.		OK
A.3.2. Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country?	/1/	DR I	The project applies Monsanto Heat Recovery System (HRS), which is a world wide patented technology owned by Monsanto Enviro-chem System Inc. Two Lions (Zhangjiagang) Fine Chemicals Co., Ltd. is the first in mainland China to use the Monsanto HRS technology and equipment.		OK
A.3.3. Does the project make provisions for meeting training and maintenance needs?	/1/	DR I	Yes. The training has been provided by project owner and manufacturer.		OK
A.4. Contribution to Sustainable Development <i>The project's contribution to sustainable development is assessed.</i>					
A.4.1. Has the host country confirmed that the project assists it in achieving sustainable development?		I	The letter of approval from the DNA of China confirming the project being in line with the sustainable development policies of host country has not been received.	~~CAR-1~~	OK
A.4.2. Will the project create other environmental or social benefits than GHG emission reductions?	/1/	DR I	Yes. The project will, among others benefits, mitigate local environmental pollution caused by coal-fired power plants; create local employment opportunity and facilitating the technology development of waste heat recovery in the chemical industry.		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B. Project Baseline <i>The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.</i>						
B.1. Baseline Methodology <i>It is assessed whether the project applies an appropriate baseline methodology.</i>						
B.1.1. Does the project apply an approved methodology and the correct version thereof?		/1/ /17/	DR I	Yes. The project applies ACM0004 (version 02) “Consolidated baseline methodology for waste gas and/or heat and/or pressure for power generation”.		OK
B.1.2. Are the applicability criteria in the baseline methodology all fulfilled?		/1/ /17/	DR I	Yes. The project generates electricity from waste heat recovered in the sulfuric acid production process. The electricity generated displaces electricity generation with fossil fuels in the electricity grid. No fuel switch is done in the process of waste heat production after the implementation of the project activity.		OK
B.2. Baseline Scenario Determination <i>The choice of the baseline scenario will be validated with focus on whether the baseline is a likely scenario, and whether the methodology to define the baseline scenario has been followed in a complete and transparent manner.</i>						
B.2.1. What is the baseline scenario?		/1/	DR I	The baseline is determined as import of electricity from the ECPG.		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.2.2. What other alternative scenarios have been considered and why is the selected scenario the most likely one?	/1/	DR I	The alternative baseline scenarios have been suitably identified as, a) The proposed project activity is not undertaken as a CDM project activity; b) Import of electricity from the ECPG; c) TFC sets up a new fossil fuel-fired power plant on-site for exporting electricity to East China Grid; d) TFC sets up a new renewable energy power plant on-site for exporting electricity to ECPG; e) Other uses of the waste heat and waste gas: TFC recovers the waste steam to supply heat for other facilities of TFC or other enterprises nearby. The fossil fuel-fired power plant does not comply with the Chinese law as thermal power plants with a capacity less than 135 MW are prohibited to be built in areas covered by large grids such as provincial grids. Renewable energy such as wind, hydro resources at the project site are not sufficiently available to provide electricity to the grid. Other uses of the waste heat, i.e. supplying heat for other facilities of TFC or		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
				other enterprises nearby is not a realistic baseline option because as per the <i>Approval of Environmental Impact Assessment and Environmental Protection Plan of Jiangsu Yangtze River Chemical Industry district</i> , the heat or steam used in the district must be supplied by the thermal electricity plant of Free Trade Zone. The proposed project activity not undertaken as a CDM project activity is also not a realistic and credible alternative, as discussed in the analysis below. The only realistic and credible baseline scenario is import of electricity from the ECPG.		
B.2.3.	Has the baseline scenario been determined according to the methodology?	/1/ /17/	DR I	Yes.		OK
B.2.4.	Has the baseline scenario been determined using conservative assumptions where possible?	/1/ /17/	DR I	Yes.		OK
B.2.5.	Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1/ /17/	DR I	Yes. The renewable energy law, sectoral policy and development trends in ECPG have been taken into account.		OK
B.2.6.	Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?	/1/	DR I	Yes.		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.2.7. Have the major risks to the baseline been identified?	/1/	DR I	There are no significant risks to the baseline except the enforcement of the Chinese renewable law. However, as this law is being implemented after the entry into force of decision 17.CP 7, it does not need to be taken into account.		OK
B.3. Additionality Determination <i>The assessment of additionality will be validated with focus on whether the project itself is not a likely baseline scenario.</i>					
B.3.1. Is the project additionality assessed according to the methodology?	/1/ /17/	DR I	The project additionality is demonstrated by applying the “Tool for the demonstration and assessment of additionality”. <i>Step 1: Identification of the alternatives to the project activity consistent with the current laws and regulations.</i> The only realistic and credible alternative for the project scenario is the equivalent capacity or electricity service provided by the ECPG. <i>Step 2: Investment analysis.</i> Benchmark analysis (Option III) is justified to conduct the investment analysis. - In China, equity IRR of 15 % is regarded as benchmark for investments in fine chemical industry. The project IRR		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			without CER revenues is 11.76 % which shows that the project is not financially attractive in absence of CDM benefits. - The input data for the financial analysis is based on the approved feasibility study. The project developer is requested to justify the deviation in the initial investment. - The impact of the total investment, electricity price and operation and maintenance fee on project financial performance is considered in the sensitivity analysis. It shows that when the total investment and O&M fee fluctuate within the range of -10% and 10%, the IRR for total investment will not reach the benchmark. - Further explanations are invited to demonstrate that the project activity will remain less attractive with the reasonable fluctuation of the electricity price. <i>Step 3: Barrier analysis.</i> Barrier analysis has been conducted as supplementary to the investment analysis. - Technological barriers: The demand of the sulphuric acid production operation is more strict than usual after applying the	~~CL-1~~ ~~CL-2~~	

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			HRS and power generation system, especially in the range of sulphuric acid concentration and the temperature, which leads to high risk and uncertainty of project operation and high requirement to the operation staff. Monsanto Heat Recovery System (HRS) is a patented technology owned by Monsanto Enviro-chem System Inc. Skilled and experienced labour to operate and maintain the technology is lack and training on required technology for the staffs needs to be carried out during implementation of the proposed project. - Furthermore, the project is the first in mainland China to use the Monsanto HRS technology and equipment. The technology lacks operation experiences in domestic market. The barriers mentioned above would not prevent the alternative that electricity service provided by the east China power grid from implementation. <i>Step 4: Common practice analysis.</i> In common practice, projects using Monsanto HRS (heat recovery system) are analyzed. However, the <i>Tool for the demonstration and</i>	CL-3	

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			<i>assessment of additionality</i> requires that any other activities implemented previously or currently underway that are similar to the proposed project activity should be analyzed and projects are considered similar if they are in the same country/region and/or rely on a broadly similar technology. Therefore projects that utilize heat recovered in sulfuric acid production process using broadly similar technology need to be analyzed. The investment analysis shows the potential benefit of CDM income will increase investment return and reduce investment risk directly. If the project is registered as CDM project successfully, TFC can invite foreign experts to provide training to employees so as to guarantee successful running and to employ excellent researchers to study on the advanced technology with the CDM revenues.		
B.3.2. Are all assumptions stated in a transparent and conservative manner?	/1/	DR I	Refer to CL 1-CL 3.	~~CL 1~~ ~~CL 2~~ ~~CL 3~~	OK
B.3.3. Is sufficient evidence provided to support the relevance of the arguments made?	/1/	DR	Refer to CL 1-CL 3.	~~CL 1~~ ~~CL 2~~	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			I		~~CL-3~~	
B.3.4. If the starting date of the project activity is before the date of validation, has sufficient evidence been provided that the incentive from the CDM was seriously considered in the decision to proceed with the project activity?		/1/ /7/ /8/ /9/ /10/	DR I	Early in 2003, Monsanto Enviro-chem System Inc. introduced CDM to Two Lions (Zhangjiagang) Fine Chemicals Co., Ltd. and they discussed about applying for CDM project. The notebook with the content of the meeting between Monsanto Enviro-chem System Inc. and Two Lions (Zhangjiagang) Fine Chemicals Co., Ltd. provided by the General Manager Mr. Yuan Yafei dated 9 May 2003 has been verified by DNV. It noted that the development of CDM would be provided by Monsanto Enviro-chem System Inc. The emails between Patrick Michael Ritschel of Monsanto Enviro-chem System Inc. and Patrick Vizzzone of Dutch Rabobank about the CDM corporation of the project dated July 2003 to April 2004 have also been provided and verified. On 22 December 2003, the Monsanto Enviro-chem System Inc. provided the Project Idea Note (PIN) to the Two Lions (Zhangjiagang) Fine Chemicals Co., Ltd. Considering the impact of CDM that would bring to the project, the project received the construction permission on 7 May 2004. The PIN and the evidence of the project start date have also been verified		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
				by DNV. It shows that the incentive from the CDM was seriously considered in the decision to proceed with the project activity.		
B.4. Calculation of GHG Emission Reductions – Project emissions <i>It is assessed whether the project emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>						
B.4.1. Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/ /17/	DR I		There is no auxiliary fuel firing due to the project activity, therefore the project emission is regarded as zero.		OK
B.4.2. Have conservative assumptions been used when calculating the project emissions?	/1/	DR I		Ditto		OK
B.4.3. Are uncertainties in the project emission estimates properly addressed?	/1/	DR I		Ditto		OK
B.5. Calculation of GHG Emission Reductions – Baseline emissions <i>It is assessed whether the baseline emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>						
B.5.1. Are the calculations documented according to the approved methodology and in a complete and	/1/	DR		Yes. Baseline emissions are computed as a function of the baseline emission factor of the		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
transparent manner?		/17/	I	east China power grid and the net electricity generated by the project activity which will substitute equivalent amount of power imported from the grid. The grid emission factor is calculated in line with ACM0002 as a combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM). In the calculation of BM emission factor, the coal emission factor is taken as thermal emission factor, please justify the conservativeness.	~~CL~~ 4	
B.5.2. Have conservative assumptions been used when calculating the baseline emissions?		/1/	DR I	Refer to CL 4.		OK
					~~CL~~ 4	
B.5.3. Are uncertainties in the baseline emission estimates properly addressed?		/1/	DR I	Yes.		OK
B.6. Calculation of GHG Emission Reductions – Leakage <i>It is assessed whether leakage emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values</i>						

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview <i>– where applicable – is justified.</i>	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.6.1. Are the leakage calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	There are no leakages that need to be considered in applying this methodology.		OK
B.6.2. Have conservative assumptions been used when calculating the leakage emissions?	/1/	DR	Ditto		OK
B.6.3. Are uncertainties in the leakage emission estimates properly addressed?	/1/	DR	Ditto		OK
B.7. Emission Reductions <i>The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.</i>					
B.7.1. Are the emission reductions real, measurable and give long-term benefits related to the mitigation of climate change.	/1/	DR I	Yes.		OK
B.8. Monitoring Methodology <i>It is assessed whether the project applies an appropriate monitoring methodology.</i>					
B.8.1. Is the monitoring plan documented according to the approved methodology and in a complete and transparent manner?	/1/ /17/	DR I	The monitoring plan is in accordance with the approved monitoring methodology ACM0004 (version 02) “Consolidated monitoring methodology for waste gas and/or		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			heat and/or pressure for power generation” and is in a complete and transparent manner.		
B.8.2. Will all monitored data required for verification and issuance be kept for two years after the end of the crediting period or the last issuance of CERs, for this project activity, whichever occurs later?	/1/	DR I	Yes.		OK
B.9. Monitoring of Project Emissions <i>It is established whether the monitoring plan provides for reliable and complete project emission data over time.</i>					
B.9.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?	/1/	DR I	There is no auxiliary fuel firing due to the project activity, therefore the project emission is regarded as zero.		OK
B.9.2. Are the choices of project GHG indicators reasonable and conservative?	/1/	DR I	Ditto		OK
B.9.3. Is the measurement method clearly stated for each GHG value to be monitored and deemed appropriate?	/1/	DR I	Ditto		OK
B.9.4. Is the measurement equipment described and deemed appropriate?	/1/	DR I	Ditto		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.9.5. Is the measurement accuracy addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?	/1/	DR I	Ditto		OK
B.9.6. Is the measurement <i>interval</i> identified and deemed appropriate?	/1/	DR I	Ditto		OK
B.9.7. Is the <i>registration, monitoring, measurement and reporting</i> procedure defined?	/1/	DR I	Ditto		OK
B.9.8. Are procedures identified for <i>maintenance</i> of monitoring equipment and installations? Are the calibration intervals being observed?	/1/	DR I	Ditto		OK
B.9.9. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)?	/1/	DR I	Ditto		OK
B.10. Monitoring of Baseline Emissions <i>It is established whether the monitoring plan provides for reliable and complete baseline emission data over time.</i>					
B.10.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	/1/	DR I	In the project the emission factor of the regional grid is calculated <i>ex-ante</i> using the Combined Margin method based on the most recent information available as described in ACM0002. So only the net electricity		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			generation from the proposed project activity will be monitored. The net electricity generation from the proposed project activity is the difference between the total electricity generated from the project and the auxiliary electricity.		
B.10.2. Are the choices of baseline GHG indicators reasonable and conservative?	/1/	DR I	The choice of baseline indicators is in line with ACM0004.		OK
B.10.3. Is the measurement method clearly stated for each baseline indicator to be monitored and also deemed appropriate?	/1/	DR I	Yes. The total electricity generated from the project and the auxiliary electricity will be measured continuously through the electricity meters. The data of electricity will be accumulated and saved by the electricity meters and showed on DCS.		OK
B.10.4. Is the measurement <i>equipment</i> described and deemed appropriate?	/1/	DR I	Yes. The measurement will be taken by electricity meters, whose accuracy degree is deemed appropriate.		OK
B.10.5. Is the measurement <i>accuracy</i> addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?	/1/	DR I	Yes. The total electricity generated from the project will be measured through a main electricity meter and a backup electricity meter installed and sealed by Zhangjiagang Power Supply Company at switch box C3507. The two electricity meters and the electricity meter that measures the auxiliary electricity		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
				will be calibrated by Suzhou Measure and Test Institute once a year in accordance with the <i>Criterion of electric energy meters for AC measure (TTG307-2006)</i> . Procedures on how to deal with erroneous measurements have not been in place.	~~CL-5~~	
B.10.6. Is the measurement <i>interval</i> for baseline data identified and deemed appropriate?	/1/	DR I		The electricity supplied to the grid will be measured continuously.		OK
B.10.7. Is the registration, <i>monitoring, measurement and reporting</i> procedure defined?	/1/	DR I		Yes.		OK
B.10.8. Are procedures identified for <i>maintenance</i> of monitoring equipment and installations? Are the calibration intervals being observed?	/1/	DR I		Yes. Procedures for maintenance of monitoring equipment and installations have been identified. The calibration interval is once a year.		OK
B.10.9. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/1/	DR I		The procedures for archiving of monitored data are not clearly described.	~~CL-6~~	OK
B.11. Monitoring of Sustainable Development Indicators/ Environmental Impacts <i>It is assessed whether choices of indicators are reasonable and complete to monitor sustainable performance over time.</i>						

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.11.1. Is the monitoring of sustainable development indicators/ environmental impacts warranted by legislation in the host country?	/1/	DR I	DNA of China does not require collection and archiving of data related to environmental, social and economic impacts. The environmental impacts will be monitored by local environmental authority.		OK
B.11.2. Does the monitoring plan provide for the collection and archiving of relevant data concerning environmental, social and economic impacts?	/1/	DR I	The indicators of environmental impacts will be stipulated by local environmental authority.		OK
B.11.3. Are the sustainable development indicators in line with stated national priorities in the Host Country?	/1/	DR I	Yes. This will be on local authority decision.		OK
B.12. Project Management Planning <i>It is checked that project implementation is properly prepared for and that critical arrangements are addressed.</i>					
B.12.1. Is the authority and responsibility of overall project management clearly described?	/1/	DR I	Yes. The authority and responsibility of overall project management is clearly described.		OK
B.12.2. Are procedures identified for training of monitoring personnel?	/1/	DR I	Procedures for monitoring personnel training have are identified.		OK
B.12.3. Are procedures identified for emergency preparedness for cases where emergencies can	/1/	DR I	Procedures for emergency preparedness for cases where emergencies can cause		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
cause unintended emissions?			unintended emissions are identified.		
B.12.4. Are procedures identified for review of reported results/data?	/1/	DR I	Yes. The CDM manager will check the daily operation report forms and archive emergency situation disposal report.		OK
B.12.5. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	/1/	DR I	Procedures for corrective actions in order to provide for more accurate future monitoring and reporting have not been identified.	~~CL-7~~	OK
C. Duration of the Project/ Crediting Period <i>It is assessed whether the temporary boundaries of the project are clearly defined.</i>					
C.1.1. Are the project's starting date and operational lifetime clearly defined and evidenced?	/1/	DR I	The project started operation on 24 June 2005. The estimated lifetime of the project is 20 years. The evidence of the project construction start date needs to be provided.	~~CL-8~~	OK
C.1.2. Is the start of the crediting period clearly defined and reasonable?	/1/	DR I	A fixed crediting period of 10 years is selected starting from 1 June 2008.		OK
D. Environmental Impacts <i>Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.</i>					
D.1.1. Has an analysis of the environmental impacts of the project activity been sufficiently described?	/1/	DR	Yes. The environmental impacts during construction and operation are elaborated in		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
		/5/	I	the PDD, mainly about impacts of dust, noise, waste water and solid waste on environment.		
D.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?		/1/ /5/	DR I	Yes. The project has been approved by the Environmental Protection Bureau of Jiangsu Province.		OK
D.1.3. Will the project create any adverse environmental effects?		/1/ /5/	DR I	There are no significant adverse environmental effects for the project according to the EIA.		OK
D.1.4. Are transboundary environmental impacts considered in the analysis?		/1/ /5/	DR I	There are no transboundary environmental impacts foreseen for the project.		OK
D.1.5. Have identified environmental impacts been addressed in the project design?		/1/ /5/	DR I	Yes.		OK
D.1.6. Does the project comply with environmental legislation in the host country?		/1/ /5/	DR I	Yes.		OK
E. Stakeholder Comments <i>The validator should ensure that stakeholder comments have been invited with appropriate media and that due account has been taken of any comments received.</i>						
E.1.1. Have relevant stakeholders been consulted?		/1/	DR I	Yes. Besides the stakeholder consultation process required by Chinese EIA regulations, an additional stakeholder consultation		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			process have been performed through inviting different stakeholders comment the project activity.		
E.1.2. Have appropriate media been used to invite comments by local stakeholders?	/1/	DR I	Two Lions (Zhangjiagang) Fine Chemicals Co., Ltd. (TFC) conducted questionnaires and interviewed local inhabitants door by door for their comments. The questionnaires do not state the date of the stakeholder consultation and it need to be specified in the PDD.	~~CL-9~~	OK
E.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	/1/	DR I	Yes. The stakeholder consultation process is in accordance with Chinese EIA regulations.		OK
E.1.4. Is a summary of the stakeholder comments received provided?	/1/	DR I	Yes. A summary of the stakeholder comments received described on the PDD.		OK
E.1.5. Has due account been taken of any stakeholder comments received?	/1/	DR I	It shows that the majority supports the project activity. The employees of TLC expressed that the company should improve its management level and take some safety measures to help the project implementation normally. TFC has established the safety alarm system and precaution measures according to the		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			comments. Furthermore, TFC has established the education training plan to facilitate the implementation of the project activity, which is based on ISO9001.		

Table 3 Resolution of Corrective Action and Clarification Requests

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
CAR 1 The letters of approval from the DNA of China and the UK have not been obtained.	A	The letters of approval from the DNA of China and the UK have been obtained.	Ok. This CAR is closed.
CL 1 The input data for the financial analysis is based on the approved feasibility study. The project developer is requested to justify the deviation in the initial investment.	B	The updated approved feasibility study justified this deviation.	Ok. This CL is closed.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
CL 2 Further explanations are invited to demonstrate that the project activity will remain less attractive with the reasonable fluctuation of the electricity price.	B	The electricity price is included in the sensitivity analysis. It shows that the IRR will be still lower than the benchmark IRR when then price changes between +/- 10%.	Ok. This CL is closed.
CL 3 In the common practice analysis, projects using Monsanto HRS (heat recovery system) are analyzed. However, the <i>Tool for the demonstration and assessment of additionality</i> requires that any other activities implemented previously or currently underway that are similar to the proposed project activity should be analyzed and projects are considered similar if they are in the same country/region and/or rely on a broadly similar technology. Therefore projects that utilize heat recovered in sulphuric acid production process using broadly similar technology need to be analyzed.	B	The common practice analysis was revised in the PDD and was verified by DNV. It conforms to the requirement of Tool for the demonstration and assessment of additionality.	Ok. This CL is closed.
CL 4 In the calculation of BM emission factor, the coal emission factor is taken as thermal emission factor, please justify the conservativeness.	B	The calculation of BM emission factor was revised following the steps of the calculation of China NDRC. It is verified as acceptable.	Ok. This CL is closed.
CL 5	B	These procedures are defined in the	Ok. This CL is closed.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
Procedures on how to deal with erroneous measurements have not been in place.		PDD, verified as acceptable.	
CL 6 The procedures for archiving of monitored data are not clearly described.		These procedures are defined in the PDD, verified as acceptable.	Ok. This CL is closed.
CL 7 Procedures for corrective actions in order to provide for more accurate future monitoring and reporting have not been identified.	B	These procedures are defined in the PDD, verified as acceptable.	Ok. This CL is closed.
CL 8 The evidence of the project construction start date needs to be provided.	C	The construction permission for the project was provided as verified as acceptable.	Ok. This CL is closed.
CL 9 Two Lions (Zhangjiagang) Fine Chemicals Co., Ltd. (TFC) conducted questionnaires and interviewed local inhabitants door by door for their comments. The questionnaires do not state the date of the stakeholder consultation and it need to be specified in the PDD.	E	The date of the stakeholder consultation was specified in the PDD.	Ok. This CL is closed.

APPENDIX B

CERTIFICATES OF COMPETENCE



CERTIFICATE OF COMPETENCE

Weidong Yang

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJI-i1

<i>GHG Auditor:</i>	Yes		
<i>CDM Validator:</i>	Yes	<i>JI Validator:</i>	--
<i>CDM Verifier:</i>	--	<i>JI Verifier:</i>	--
<i>Industry Sector Expert for Sectoral Scope(s):</i>	--		

Høvik, 4 January 2008

Michael Lehmann

Michael Lehmann

Technical Director, International Climate Change Services



CERTIFICATE OF COMPETENCE

Wilson Tang

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJ1-i1

GHG Auditor:	Yes		
CDM Validator:	Yes	JI Validator:	--
CDM Verifier:	--	JI Verifier:	--
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 13		
Technical Reviewer for (group of) methodologies:			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	Yes		
ACM002, AMS-I.A-D, AM0019, AM0026, AM0029, AM0045	Yes		

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director



CERTIFICATE OF COMPETENCE

Mindy (Ming) Yue

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJ1-i1

GHG Auditor:	Yes		
CDM Validator:	Yes	JI Validator:	--
CDM Verifier:	--	JI Verifier:	--
Industry Sector Expert for Sectoral Scope(s):	--		

Høvik, 24 January 2007

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director



CERTIFICATE OF COMPETENCE

Tim Kuo

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJ1-i1

<i>GHG Auditor:</i>	Yes		
<i>CDM Validator:</i>	--	<i>JI Validator:</i>	--
<i>CDM Verifier:</i>	Yes	<i>JI Verifier:</i>	--
<i>Industry Sector Expert for Sectoral Scope(s):</i>	--		

Høvik, 30 October 2007

Michael Lehmann

Michael Lehmann

Technical Director, International Climate Change Services



CERTIFICATE OF COMPETENCE

Hendrik Brinks

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJ1-i1

GHG Auditor:	Yes		
CDM Validator:	Yes	JI Validator:	--
CDM Verifier:	--	JI Verifier:	--
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 1, 2, 3 & 12		
Technical Reviewer for (group of) methodologies:			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	Yes	AM0013, AM0022, AM0025, AM00379, AMS-III.H, AMS- III.I	Yes
ACM002, AMS-I.A-D, AM0019, AM0026, AM0029, AM0045	Yes	ACM0006, AM0007, AM0015, AM0036, AM0042	Yes
ACM0004, ACM0012	Yes		

Høvik, 30 October 2007

Michael Lehmann

Michael Lehmann

Technical Director, International Climate Change Services



CERTIFICATE OF COMPETENCE

Ole Andreas Flagstad

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJ1-i1

<i>GHG Auditor:</i>	Yes		
<i>CDM Validator:</i>	Yes	<i>JI Validator:</i>	--
<i>CDM Verifier:</i>	--	<i>JI Verifier:</i>	--
<i>Industry Sector Expert for Sectoral Scope(s):</i>	--		

Høvik, 30 October 2007

Michael Lehmann

Michael Lehmann

Technical Director, International Climate Change Services



CERTIFICATE OF COMPETENCE

Michael Lehmann

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJ1-i1)

GHG Auditor:	Yes		
CDM Validator:	Yes	JI Validator:	--
CDM Verifier:	Yes	JI Verifier:	--
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 1, 2, 3		
Technical Reviewer for (group of) methodologies:			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	Yes	AM0027	Yes
ACM002, AMS-I.A-D, AM0019, AM0026, AM0029, AM0045	Yes	AM0030	Yes
ACM003, ACM0005, AM0033, AM0040	Yes	AM0031	Yes
ACM0004, ACM0012	Yes	AM0032	Yes
ACM0006, AM0007, AM0015, AM0036, AM0042	Yes	AM0035	Yes
ACM0007	Yes	AM0038	Yes
ACM0008	Yes	AM0041	Yes
ACM0009, AM0008, AMS-III.B	Yes	AM0034	Yes
AM0006, AM0016, AMS-III.D, ACM0010	Yes	AM0043	
AM0009, AM0037	Yes	AM0046	
AM0013, AM0022, AM0025, AM0039, AMS-III.H, AMS-III.I	Yes	AM0047	
AM0014	Yes	AMS-II.A-F, AM0044	Yes
AM0017	Yes	AMS-III.A	Yes
AM0018	Yes	AMS-III.E, AMS-III.F	Yes
AM0020	Yes		
AM0021, AM0028, AM0034, AM0051	Yes		
AM0023	Yes		
AM0024	Yes		

Høvik, 5 February 2007

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Director, International Climate Change Services

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