DETERMINATION REPORT

ACHEMA UKL-7 PLANT N2O ABATEMENT PROJECT IN LITHUANIA

REPORT NO. 2008-086

REVISION NO. 02

DETERMINATION REPORT

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CERTIFICATION AS

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Date of first issue: 2008-01-04	Project No.: 44450001
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Client: Vertis Environmental Finance plc	Client ref.: Daniel Domanovsky

Project Name: ACHEMA UKL-7 plant N_2O abatement project
Country: Lithuania
GHG reducing Measure/Technology: "Catalytic reduction of N_2O inside the ammonia burner of nitric acid plants"
ER estimate: 946 508 tCO2e/year (average)

Size
☒ Large Scale
☐ Small Scale
Determination Phases:
☐ Desk Review
☐ Follow up interviews
☒ Resolution of outstanding issues
Determination Status
☐ Corrective Actions Requested
☐ Clarifications Requested
☒ Full Approval (pending approval by Parties)
☐ Rejected

In summary, it is Det Norske Veritas Certification AS (DNV) opinion that the "ACHEMA UKL-7 plant N2O abatement project", as described in the PDD version 5, 7 September 2009, meets all relevant UNFCCC requirements for the JI and all relevant host Party criteria.
The baseline emission factor, to be used for calculation of emission reduction during the crediting period, will be established when the baseline campaigns calculations are finished. The final baseline emission factor for the plant will be adjusted in accordance with the results of the planned QAL2 tests and shall be verified as the first step of the verification by the AIE performing the verification of this project.

Report No.:	Date of this revision:	Rev. No.
2008-0863	2009-09-17	02

Report title:
ACHEMA UKL-7 plant N2O abatement project

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Key words:
Climate Change
Kyoto Protocol
Verification
Joint implementation Mechanism

DETERMINATION REPORT

Abbreviations

AMS	Automated Measuring System
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CL	Clarification request
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
DNV	Det Norske Veritas
EFMA	European Fertilizer Manufacturers Association
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
JI	Joint Implementation
MP	Monitoring Plan
N_2O	Nitrous oxide
NAP	Nitric Acid Plant
NGO	Non-governmental Organisation
NPV	Net Present Value
PDD	Project Design Document
UNFCCC	United Nations Framework Convention on Climate Change

DETERMINATION REPORT

TABLE OF CONTENTS

DETERMINATION REPORT

1 EXECUTIVE SUMMARY – DETERMINATION OPINION

Det Norske Veritas Certification AS (DNV) has performed a determination of the "ACHEMA UKL-7 plant N2O abatement project", situated in Jonavos region in Lithuania. The determination was performed on the basis of UNFCCC criteria for the Joint Implementation 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 fulfillment of the stated criteria.

By installing a secondary N_2O abatement catalyst underneath the ammonia oxidation catalyst in the ammonia oxidation burners, the generated N_2O during oxidation of ammonia will be decomposed into nitrogen and oxygen. The installed technology will according to suppliers allow more than 70% reduction of the N_2O content in the tail gas. At present the N_2O is emitted to the atmosphere, hence the project results in reductions of N_2O 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 in the average 946 508 tCO_2e per year during 2008 - 2012. The emission reduction forecast has been checked and it is deemed likely that the stated amount is 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 "UKL-7 plant N2O abatement project", situated in Jonavos region in Lithuania and as described in the PDD of 7 September 2009, meets all relevant UNFCCC requirements for the JI and all relevant host Party criteria.

2 INTRODUCTION

Vertis Environmental Finance plc has commissioned Det Norske Veritas Certification AS (DNV) to perform a determination of the "ACHEMA UKL-7 plant N2O abatement project" (hereafter called "the project"). This report summarises the findings of the determination of the project, performed on the basis of UNFCCC criteria for the JI, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 6 of the Kyoto Protocol, the Guidelines for the implementation of Article 6 of the Kyoto Protocol and the subsequent decisions by the JI Supervisory Committee.

2.1 Objective

The purpose of a determination 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. Determination is a requirement for all JI projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of emission reduction units (ERUs).

2.2 Scope

The determination scope is defined as an independent and objective review of the project design document, the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations. DNV has based on the recommendations in the Validation and Verification Manual employed a risk-based approach in the determination, focusing on the identification of significant risks for project implementation and the generation of ERUs.

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

3 METHODOLOGY

The determination 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 determination report and opinion.

The following sections outline each step in more detail.

3.1 Desk Review of the Project Design Documentation

The following table outlines the documentation reviewed during the determination:

/1/ Vertis Environmental Finance Zrt.: Project design document for the "ACHEMA UKL-7 plant N2O abatement project", Version 01, 17 October, 2007.
Vertis Environmental Finance Zrt.: Project design document for the "ACHEMA UKL-7 plant N2O abatement project", Version 1, 21 November, 2008.
Vertis Environmental Finance Zrt.: Project design document for the "ACHEMA UKL-7 plant N2O abatement project", Version 4, 7 18 May 2009.
Vertis Environmental Finance Zrt.: Project design document for the "ACHEMA UKL-7 plant N2O abatement project", Version 5, 7 September 2009.

/2/ UNFCCC: Report of the review of the initial report for Lithuania. FCCC/IRR/2007/LTU. 31 October 2007.

/3/ International Emission Trading Association (IETA) & the World Bank's Prototype Carbon Fund (PCF): *Validation and Verification Manual*. http://www.vvmanual.info

/4/ CDM-EB: *Approved Baseline and Monitoring Methodology AM0034 - "Catalytic reduction of N_2O inside the ammonia burner of nitric acid plants"*, Version 02

/5/ CDM-EB: *Approved Baseline and Monitoring Methodology AM0028 - "Catalytic N2O destruction in the tail gas of Nitric Acid or Caprolactam Production Plants"*, Version 4.1

/6/ CDM-EB: *Tool for the demonstration and assessment of additionality* Version 3

/7/ UNFCCC: *Decision 9/CMP1 Guidelines for the implementation of Article 6 of the Kyoto Protocol* 30 March 2006

/8/ UNFCCC: *Decision 9/CMP1 APPENDIX B Criteria for baseline setting and monitoring to Guidelines for the implementation of Article 6 of the Kyoto Protocol* 30 March 2006

/9/ The Ministry of Environment of the Republic of Lithuania: *Letter of Endorsement*, No. (10-5)-D8-216. 8 January 2007

The Ministry of Environment of the Republic of Lithuania: *Letter of Approval, No. (10-07)-D8-4098. 11 May 2009.*

/10/ Achema AB. Technological regulation on nitric acid No. TR-122-01, amendment No. 10, dated 14 March 2008.

DETERMINATION REPORT

/11/ Term sheet for JI development between the parties Achema AB and Vertis Environmental Finance Zrt., dated 15 December 2006.

Contract for JI development between the parties Achema AB and Vertis Environmental Finance Zrt., dated 15 February 2007.

/12/ QAL1 suitability test report for the stack gas flow meter DURAG DFL200. Report-#. 99CU019 dated 12.08.2000, TÜV North.

/13/ QAL 1 suitability for N_2O analyzer Sermomex 4900 Multigas analyser. Example of Assessment of Compliance with Required Measurement Quality for Emmissions Monitoring Applications (QAL 1) in accordance with EN ISO14956 and EN14181.

/14/ Sira Certification Service. Product conformity certificate for Sermomex 4900 Multigas analyzer.MCERTS Performance Standards for Continuous Emission Monitoring Systems, March 2002.

/15/ ECM Eco Monitoring: List of spare parts for UKL-7 N2O monitoring measurements equipment delivered.

/16/ Achema AB Procedure No. 5666739-32. HNO_3 concentration methodology.

/17/ Achema AB Procedure for operating conditions. Dated 25 May 2007.

/18/ Finanical analysis for JI project. Achema AB business model.
Achema Business Case Model v.C.06_ASSUMPTIONS
Achema Business Case Model v.C.06_SUMMARY
Achema Business Case Model v.C.06_TOTAL

/19/ Achema AB. *Information on primary catalyst*

/20/ Letter from The Mayor of Municipality of Jonava City regarding positive impact of the implementation of the JI project. Dated 28 November 2007.

/21/ Vertis Environmental Finance Zrt.
Statement to the comment of German Federal Environment Agency regarding whether emissions of N_2O should be regulated by the Lithuanian authorities in the framework of the IPPC. Dated March 2008.

/22/ Letter to Achema from the Lithuania Republic Environmental Ministry Kaunas Regional Environmental Department stating no limits on N_2O emissions are included in the IPPC permit No. 2/15-04, issued to SC ”Achema” in 28-12-2004. Dated 25 January 2008.
Updated IPPC permit No. 2/15 code 156667299 dated 30 April 2008.

/23/ Letter to Achema from the Lithuania Republic Environmental Ministry Kaunas Regional Environmental Department stating that Environmental Impact Assessment is not mandatory for implementation of the JI project.

/24/ ISO 14001:2004 Certificate for Stock company Achema Jonava. Production and sales of fertilizer and other products. Number 99586. Issued first time 1 November 2000. Valid until 1 November 2009.

/25/ ISO 9001:2000 Certificate for Stock company Achema Jonava. Production and sales of fertilizer and other products. Number 79828. Issued first time 1 February 1998. Valid until 1 January 2010.

/26/ ECM ECO Monitoring: Maintenance Certificate for training of Achema AB personnel. N_2O monitoring system and data logging.

/27/ ECM ECO Monitoring: Monitoring of N_2O emissions from HNO_3 production. Quality of monitoring. Discussion of total uncertainty according to EN ISO 14956 (QAL 1). Document No. 0105/07-287/2006.

/28/ ECM ECO Monitoring: Operation and maintenance manual N_2O emission monitoring system Achema plant, Lithuania.Version 3. Dated September 2007.
/29/ Achema AB: Primary ammonia oxidation catalyst information. Historical data.
/30/ ECM ECO Monitoring: Revised Quotation for N_2O emission monitoring system for Achema plant, Lithuania. No. 287/2006. Dated March 2007.
/31/ ECM ECO Monitoring: Monitoring of N_2O emissions from HNO_3 production. Quality assurance manual. Validation of monitored data according to QAL 3 under EN14181. Document No. 0109/07-287/2006.
/32/ Excel sheet: Determination of normal campaign lengths, CL_{normal}.
/33/ Excel sheet: Preliminary baseline campaign data.
/34/ Achema AB: *Instrukcija A-245-07*
Annex 1 Description of internal audits
Annex 1 Description of QAL 3 procedure
Annex 3 Emergency procedure
Annex 5 Supervision of Monitoring systems
Annex 6 Supervision of QAL 3 procedure
Achema data processing procedure.
/35/ ECM ECO Monitoring training certificates:
-Maintenance of N2O monitoring system in Achema plant
-Operation and basic maintenance of N2O monitoring system in Achema plant

3.2 Follow-up Interviews with Project Stakeholders

Date	Name	Organization	Topic
2007-11-22	Daniel Domanovsky	Vertis Environmental Finance	• Project activity • Legal requirements for nitric acid plants in Lithuania • Technology employed • Evidence to demonstrate additionality of the project • Monitoring plan • Ammonia oxidation primary catalyst information • Permitted operating conditions and baseline campaign data • Ex-ante emission reduction estimation • Environmental licenses and legal compliance • Stakeholders consultation process • Management system
	Juozas Tunaitis Technical director	Achema AB	
	Ausra Januskeviciute Project Manager	Achema AB Innovation Centre	
	Stasys Pakstys Managing Engineer	Achema AB Instrumentation Department	
	Ramunas Pilsudskas Deputy Chief	Achema AB Nitric Acid plant JI project responsible	
	Vytautas Petrikas Plant Manager	Achema AB Nitric Acid plant	
	Vaidas Januskevicins	Achema AB	

Ausra Januskevicite	Acehma AB
Tadas Kastanauskas	Environmentalist Achema Group, Vilnius (mother company of Achema AB)

3.3 Resolution of Outstanding Issues

The objective of this phase of the determination was to resolve any outstanding issues which needed be clarified prior to DNV's positive conclusion on the project design. In order to ensure transparency a determination protocol was customised for the project. The protocol shows in transparent manner criteria (requirements), means of verification and the results from validating the identified criteria. The determination protocol serves the following purposes:

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

The determination protocol consists of three tables. The different columns in these tables are described in the figure below. The completed determination protocol for "ACHEMA UKL-7 plant N2O abatement project" is enclosed in Appendix A to this report.

Findings established during the determination can either be seen as a non-fulfilment of JI 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) JI and/or methodology specific requirements have not been met; or
iii) there is a risk that the project would not be accepted as a JI project or that emission reductions will not be issued.

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

3.4 Internal Quality Control

The draft determination report including the initial determination findings underwent a technical review before being submitted to the project participants. The final determination report underwent another technical review before being forwarded to the Supervisory Committee. The technical review was performed by a technical reviewer qualified in accordance with DNV's qualification scheme for CDM/JI validation/determination and verification for a specific methodology/sector group of methodologies.

DETERMINATION REPORT

3.5 Determination Team

Role/Qualification	Last Name	First Name	Country
Team leader CDM validator and Sector expert	Kopperud	Trine	Norway
JI determinator	Flagstad	Ole Andreas	Norway
Technical Reviewer	Lehmann	Michael	Norway

Determination Protocol Table 1: Mandatory Requirements for JI 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.*

Determination 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 01 - in effect as of: 15 June 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 c**orrective action request (CAR)** due to non-compliance with the checklist question (See below). A request for clarification (CL) is used when the determination team has identified a need for further clarification.*

Determination 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***	***Determination conclusion***
If the conclusions from the draft Determination 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 determination team should be summarised in this section.*	*This section should summarise the determination team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".*

Figure 1 Determination protocol tables

4 DETERMINATION FINDINGS

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

4.1 Participation Requirements

The host Party is Lithuania. Lithuania has designated a focal point and has submitted its national guidelines and procedures for the approval of JI projects, and thus meets the participation requirements (Marrakech Accords, JI Modalities, §20).

There are one private entity participating in the project: Achema AB (Project Owner)

The letter of approval of voluntary participation and approval from Lithuania has been issued 11 May 2009. /9/

4.2 Project Design

The purpose of this project is the reduction of nitrous oxide (N_2O) emissions from the UKL-7 nitric acid plant at Achema AB.

N_2O formation is a result of unwanted chemical reactions that take place during the catalytic oxidation of ammonia which is the first stage in the nitric acid production process. Some part of the N_2O is destroyed already in the ammonia oxidation reactor, while the non destroyed N_2O is emitted with the tail gases. N_2O is a high potential greenhouse gas with a greenhouse warming potential (GWP) of 310.

The project will involve the installation of a secondary N_2O reduction catalyst underneath the primary precious metal catalyst and catchments gauzes package in each of the eight ammonia oxidation burners in the UKL-7 nitric acid plant.

The secondary catalyst will be placed in the appropriate support structure. The gap between the edge of the support structure and inside wall of the ammonia burner will be sealed to prevent the process gas by-passing the secondary catalyst. In this way the technology will ensure that all gases which pass through the primary catalyst also will pass through the secondary catalyst.

According to major secondary catalyst suppliers, the installation of the secondary catalysts will allow more than 70% -95% reduction of the N_2O content in the tail gas.

At this stage, the supplier of the secondary catalyst has not been chosen.

Achema AB production lines operate at 0.8 MPa in the ammonia oxidation process. Nameplate capacity of the plant is 350 metric tons of nitric acid per day per line, in total 2800 metric tons per day. This corresponds to 127 750 metric tons per year per line (365 days x 350 tons) and in total 1 022 000 tons per year.

The normal length of the primary catalyst campaign in the ammonia oxidation reactors are based on the length of 5 previous campaigns, which is determined to be in the range of 58-64 ktons HNO_3 for the eight lines corresponding to approximately 6 months operation (at the design capacity of 350 metric tonnes of nitric acid per day).

The JI crediting period is selected to be 1 January 2008 till 31 December 2012. The project start date is December 2006, when an official decision to proceed with the project was made /11/. The project is expected to operate beyond 31 December 2012.

4.3 Baseline Determination

The baseline determination of the project is based on the approved CDM methodology AM0034 version 02. The project meets the conditions of the applicability of AM0034/Version 02 as follows:

- *Limited to the existing production capacity, where the commercial production had began no later than 31 December 200*5: the Achema UKL-7 nitric acid plant started the commercial operation in 1972 and line 8 started in 1976. The design capacity is 350 ton HNO_3 per day per line, corresponding to a yearly design capacity of 127 750 ton HNO_3 per line.
- *The project activity will not result in the shut down of any existing N_2O destruction facility in the plant:* Achema AB currently has no N_2O destruction facility installed.
- *The project activity shall not affect the level of nitric acid production:* The project activity will decompose N_2O by the use of a secondary catalyst and thus the level of nitric acid production is not expected to be affected.
- *There are currently no regulatory requirements or incentives to reduce levels of N_2O emissions from nitric acid plants in the host country:* There is currently no regulatory requirement or incentives to reduce N_2O emissions in addition to the levels as defined in the IPPC permit (see chapter 4.4). The project is additional to legal requirements as the levels imposed to the Achema plant until 2013 are higher than the present levels of N_2O emissions prior to the installation of secondary N_2O abatement catalyst.
- *No N_2O abatement technology is currently installed in the plant:* No N_2O abatement technology is installed.
- *The project activity will not increase NO_X emissions:* The N_2O destruction process by the use of a secondary catalyst technology does not increase the level of NO_X emissions.
- *NO_X abatement catalyst installed, if any, prior to the start of the project activity is not a Non-Selective Catalyst Reduction (NSCR) DeNO_X unit:* Achema has at all 8 production lines installed Selective Catalytic Reduction De-NO_x units:

  UKL-7/1-November 2000
  UKL-7/2-October 2000
  UKL-7/3-September 2000
  UKL-7/4-June 2001
  UKL-7/5-June 2000
  UKL-7/6-February 2001
  UKL-7/7-March 2003
  UKL-7/8-December 2004
- *Operation of the secondary N_2O abatement catalyst installed under the project activity does not lead to any process emissions of greenhouse gases, directly or indirectly:* The secondary catalyst system does not consume any additional energy, e.g. power, steam or compressed air.

- *Continuous real-time measurements of N_2O concentration and total gas volume flow can be carried out in the stack:* The N_2O concentration and gas volume flow is to be measured by eight separate sets of monitoring equipment. The baseline campaigns started in September 2007 and were completed in the period until November 2008.

All applicability criteria of AM0034 version 02 are fulfilled.

The baseline scenario was identified using the procedure for "*Identification of baseline scenario*" described in the approved methodology "*Catalystic N_2O destruction in the tail gas of Nitric Acid Plants*" AM0028 v.4.1 as referred to in AM0034. The methodology application first involves an identification of possible baseline scenarios, and eliminating those that would not qualify. As a result the only feasible baseline is a continuation of the *status quo*, which meets current regulations, and requires neither additional investments nor additional running costs. Therefore, the continuation of the current situation can be selected as the baseline scenario. The explanation of methodological choices is clearly described and is deemed reasonable.

The baseline emission rates will be determined by measuring the N_2O emission factor (kg N_2O/tonne HNO_3) during a complete production campaign for the eight production lines prior to the installation of the secondary catalyst. The baseline campaigns started 1 September 2007 and continued until November 2008.

To assure that the data obtained during the baseline campaigns are representative for the actual GHG emissions from the source plant, a set of process parameters known to affect N_2O generation (that are under the control of the plant operator) shall be defined as required according to AM0034. These "permitted operating ranges" are defined from the data available in the operating manuals for the eight nitric acid plants, as there was not enough detailed complete historical operational data available. This approach is in compliance with AM0034. The final verification of the permitted operation ranges and the primary catalysts used shall be verified as the first step of the verification by the AIE performing the verification of this project.

The campaigns, which will be used for setting the baseline, are using flow measurement and all necessary monitoring equipment is installed and in operation.

Annex 2 of the PDD contains an estimate of the baseline emissions factors representing the average N_2O emissions per tone of nitric acid. The results from the baseline campaign, and thus the actual baseline emissions factors to be used to determine the baseline emissions will be subject to verification by the verifying AIE (see also 4.6).

4.4 Additionality

The project's additionality is demonstrated by applying the "Tool for the demonstration and assessment of additionality" (version 04). The tool is used as a methodology for proving that the project is not economically attractive in absence of JI benefits:

Step 1

DETERMINATION REPORT

Identification of alternatives to the project activity consistent with current laws and regulations: As suggested by the CDM methodology AM0034/Version 02 Step 1 has been omitted because section B.1 for identifying and describing baseline scenario has already identified the continuation of the status quo as the only realistic alternative to the chosen project scenario, which is also consistent with mandatory laws and regulations of Lithuania.

Step 2

Investment analysis

As described in section "Identification of the baseline scenario", in the absence of the JI project, no installation of any equipment which would reduce N_2O emissions is the most likely baseline scenario. This means that there is no reduction of N_2O emissions, and N_2O emissions would remain at present level. There is no economic benefit for the installation of a nitrous oxide abatement system except for the revenue from the sale of Emission Reduction Units within the JI framework /18/.

Step 3

Barrier analysis

Step 3 was omitted as Step 2 was used to demonstrate the project's additionality.

Step 4

Common practice analysis

This step allows to double check for the previous demonstration of the project additionality, demonstrating that besides being the only plausible alternative from a financial point of view the project also introduces an innovative practice in the industry of the region regarding greenhouse gas abatement activity.

Achema plant is the only nitric acid producer in the Baltics region. It is not business as usual to install nitrous oxide abatement systems. However updated IPPC permit dated 30 April 2008 are defining the required limit for emissions of N2O as follows:

Year 2008	8 494.2	t N_2O/year
Year 2009	9 266.4	t N_2O/year
Year 2010	9 266.4	t N_2O/year
Year 2011	9 190.8	t N_2O/year
Year 2012	8 823.6	t N_2O/year

These levels imposed on Achema until 2013 are higher than the present levels of N_2O emissions prior to the installation of secondary N_2O abatement catalyst and thus the host country does not require any abatement of nitrous oxide before 2013 /22/.

The additionality of the project is thus sufficiently demonstrated.

However according to AM0034 should N_2O emissions regulations that apply to nitric acid plants be introduced in the Host country or jurisdiction covering the location of the project activity, such regulations shall be compared to the calculated baseline factor for the project (EF_{BL}), regardless of whether the regulatory level is expressed as:

- An absolute cap on the total volume of N_2O emissions for a set period;
- A relative limit on N_2O emissions expressed as a quantity per unit of output; or
- A threshold value for specific N_2O mass flow in the stack.

In this case, a corresponding plant-specific emissions factor cap (max. allowed $tN_2O/tHNO_3$) is to be derived from the regulatory level. If the regulatory limit is lower than the baseline factor determined for the project, the regulatory limit shall serve as the new baseline factor.

4.5 Monitoring

N_2O is the only GHG indicator that is to be accounted for.

According to the methodology, all data for this indicator are on a project specific basis; and these data are recorded from the monitoring system and planned to comply with EN 14181.

All three levels of quality assurance are clearly described in documentation made available at the site visit and comprise the following, /27/, /31/:

QAL 1: Suitability of the AMS for the specific measuring task

QAL 2: Validation of AMS following installation

QAL 3: Ongoing quality assurance during operation

The QAL 2 tests, including measurements with a standard reference method, will be performed prior to finalisation of the baseline campaign by a laboratory which has an accredited quality assurance system according to EN ISO/IEC 17025.

Relevant data, necessary for determining the baseline of anthropogenic emissions of greenhouse gases by sources within the project boundary and to monitor emissions from the project, are presented in Table D 1.1.3 and table D.1.1.1 of the PDD. This is in line with the methodology AM0034 v.02.

The UKL-7 nitric acid plant comprises recently 8 production lines numbered from 1 through 8, each with its own burner, absorption column and expansion turbine. Each production line represents a separate nitric acid production unit independent from each other. The tail gases from each line are after expansion turbines led to a common stack bus and vented through two interconnected stacks. Since the primary catalyst (ammonia oxidation catalyst) is changed at different times the emissions from each line is necessary to be measured individually. This means that eight separate sets of monitoring equipment are installed to measure tail gas flow, nitric acid production, nitric acid concentration, and the operating conditions. Three N_2O analyzers measure the N_2O concentration in the tail gas of the 8 lines on a switched basis. This mean the proportion of the data monitored is not 100% as required by AM0034, version 02. However an analysis was performed to investigate the consequence of this approach. This analysis shows a difference between a 100% proportion of data monitored and a 24%

proportion of data monitored of 0.58%. This is not regarded material and the approach of using 3 switched N_2O analyzers are regarded appropriate.

4.5.1 Parameters determined ex-ante

Details of the data to be collected, the frequency of data recording, its certainty, and format are described. The format for data archiving seems appropriate for the project. The data storage lengths are indicated in the PDD and are in accordance with AM0034. The ammonia oxidation parameters and their related permitted operating ranges (ammonia gas flow rate, ammonia to air ratio, oxidation temperature and pressure), the campaign length of the baseline campaign and the normal campaign length will according to AM0034 be archived for at least 2 years. The remaining required parameters will according to AM0034 be stored for the entire crediting period. Further the parameters will be stored 2 years after the crediting period according to paragraph 37 of the JI guidelines.

The nameplate capacity of 350 metric tons 100% nitric acid per day per line; in total 2800 metric tons of 100% nitric acid for 8 lines corresponding to a yearly production rate of 1 020 000 tons of 100% nitric acid is included in D.1.4. in the PDD.

The permitted operating ranges are defined in the PDD and correspond to the operating conditions as given in the operating manual. Provided data from operating manual is:

-Oxidation temperature range: 880-910 ^oC

-Oxidation pressure range: 0-0.8 MPa

-Max. ammonia flow to AOR: 7500 Nm^3/h

-Max. ammonia/air ratio: 11.7%

Information regarding catalyst suppliers and compositions are provided for historical campaigns and baseline campaigns. The information shows the practice of alternating use of suppliers. Same types of catalyst compositions from the respective suppliers are used. These are 95%Pt/5%Rh; 90%Pt/5%Rh and FTC plus system from the catalyst suppliers Johnson Matthey, Umicore and Heraues. Taking the practice of alternating use of catalyst suppliers installed in the different lines there are no indication of change of catalyst suppliers or type of catalyst used in the baseline campaigns compared to the catalyst used in the previous 5 campaigns when assessing all 8 lines.

The calculated average of CL_{normal} is provided. The average length for 8 lines is approx. 63 000 tons 100% HNO_3 corresponding to 180 days campaign length at design capacity. Specifically for each line the CL_{normal} is determined as follows:

Line 1: 61 497 t HNO_3

Line 2: 62 682 t HNO_3

Line 3: 59 830 t HNO_3

Line 4: 65 823 t HNO_3

Line 5: 64 817 t HNO_3

Line 6: 61 599 t HNO_3

Line 7: 64 273 t HNO_3

Line 8: 63 619 t HNO_3

The final verification of the permitted ranges, the normal campaign length and catalyst installed are subject to be verified by the verifying AIE.

4.5.2 Parameters determined ex-post

Details of the data to be collected, the frequency of data recording, its certainty, and format are described. The format for data archiving seems appropriate for the project. The data storage length is indicated in the PDD to be at least 2 years and is hence in accordance to the requirements of AM0034. Further the parameters will be stored 2 years after the crediting period according to paragraph 37 of the JI guidelines.

4.5.3 Management system and quality assurance

The authority and responsibility of the project activities are described in the PDD.

Procedures for the JI project is planned to be incorporated into the existing management system. Procedures prepared for the project are attached as annexes to the document Instrukcija A-245-07. /34/

Downtime management is described in the PDD and are according to AM0034.

4.6 Estimate of GHG Emissions

Project boundary and greenhouse gas sources relevant for the project implementation are selected in accordance with AM0034 v. 02 and cover the facility and equipment for the complete nitric acid production process. The inlet of ammonia into the ammonia oxidation reactors of the eight lines is the first point in the project boundary and the gas emission from the stacks is the last point in the nitric acid production process included in the project boundary.

The project activity only comprises the GHG N_2O. No leakage calculations are required to be accounted for.

The estimated amount of GHG emission reductions from the project is 4 732 541 tones CO2 equivalents (tCO2e) during the 5 years crediting period, resulting in estimated average annual emission reductions of 946 508 tCO2e/year.

The baseline emission factor, to be used for calculation of emission reduction during the crediting period, will be established when the baseline campaigns calculations are finished. The final baseline emission factor for the plant will be adjusted in accordance with the results of the planned QAL2 tests and shall be verified as the first step of the verification by the AIE performing the verification of this project.

AM0034 methodology is designed for nitric acid plants with no more than one line, whereas in Achema UKL-7 plant there are 8 nitric acid lines. Baseline emissions are measured

separately for each line and a separate baseline factor is calculated for each line. Similarly, project emissions are recorded for each line. The number of emissions reductions of the project is the sum of emission reductions for each of the separate lines.

The JI guidelines do not at present allow having more than one monitoring report for a particular time period. Hence the project proponent has described a method where each particular line has its own campaign start and end dates. The method includes the calculation of the emission reductions for interim campaign however at the same time using the approach as described in AM0034 for shorter campaigns. If $CL_n < CL_{normal}$, EF_{BL} will be recalculated by eliminating those N_2O values that were obtained during the production of tones of nitric acid beyond the CL_n (i.e. the last tonnes produced) from the calculation of EF_n. Using this approach it is possible to break down each project campaign to interim campaigns. Each interim campaign that finishes at a later date fully overlaps the preceding interim campaigns. The method described is reasonable and ensures no higher quantity of emission reductions is claimed compared to project with only one line. An example of calculation of the project emission reductions is illustrated in the PDD, the method is checked and found acceptable by DNV.

4.7 Environmental Impacts

Achema AB is operating according to the permit (based on IPPC) issued by Kaunas Regional Environmental Department 28 December 2004 and latest renewed 30 April 2008.

According to Kaunas Regional Environmental Department an Environmental Impact Assessment (EIA) is not mandatory /23/.

4.8 Comments by Local Stakeholders

There is no host country requirement for carrying out a local stakeholder consultation process.

Neither public nor any community are likely to be affected by the project and therefore the project developer did not conduct stakeholder consultations. However, a letter was sent to the Mayor of Municipality of Jonava City with reference to the project documents for the information of the project. In response to this, a letter dated 28 November 2007 /18/, stating a positive feedback to the implementation of the JI project, was received.

4.9 Comments by Parties, Stakeholders and

The PDD was made publicly available on the JI website and Parties, stakeholders and NGOs were through the JI website invited to provide comments during a 30 days period from 23 October 2007 to 21 November 2007 under ref. no. 0089.

One comment was received and is given (in unedited form) in the below text box.

From: Karschunke Dr., Karsten [mailto:karsten.karschunke@uba.de]
Sent: 26. October 2007 17:04
To: OSL, Climate Change
Cc: Seidel, Wolfgang
Subject: JI-Project 0089, N2O-Emissions, Lithuania

DETERMINATION REPORT

Dear Michael Lehmann,

reviewing preliminarily the PDD presented for public consultation at the JISC Web Site, the following questions with respect to the baseline determination arise:

In section A.4.3 is stated that "Lithuanian law does not require any abatement of nitrous oxide". This statement is repeated on page 8 under Step 2 and therefore it is concluded that the only realistic baseline scenario is the continuation of the current situation.

Since Lithuania is a member state of the European Union, the “Acquis Communautaire” should be reflected in the reference scenario of any proposed project activities according to Article 11b of the Emission Trading Directive (2003/87/EC and 2004/101/EC), this includes the IPPC-Directive (96/61/EC).

Nitric acid plants are listed in Annex I Nr. 4.2 b) of the IPPC-directive and nitrous oxide (N2O) is listed as an air pollutant in Annex III Nr. 2. Therefore according to article 9 of the IPPC-Directive, BAT based emission limit values should be set in the permit by the competent authority. The production of nitric acid is dealt with in detail in Chapter 3 of the BAT Reference Document “Large Volume Inorganic Chemicals - Ammonia, Acids, Fertilizers” (BREF LVIC-AAF), prepared by the European Integrated Pollution Prevention and Control Bureau (EIPPCB) of the European Commission.

We kindly ask you to include in your determination report a thorough analysis of the legal requirements for nitric acid plants in Lithuania taking EU Law into account.

Yours sincerely,
on behalf of the Federal Environment Agency,

Dr. Karsten Karschunke

Federal Environment Agency
German Emissions Trading Authority
Administrative Procedures, Quality Control, JI/CDM
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german.dna.dfp@uba.de
http://www.umweltbundesamt.de/emissionshandel

How DNV has considered the comment received in its determination:

In March 2008, Vertis provided the below response to the issues raised in the comment received:

Issuance of the relevant BREF document does not represent any obligation of Member States to include the N_2O concentration limits into existing IPPC permits. Implementation of de - N_2O JI projects in a Member State can not be considered as violation of existing IPPC legislation. It is up to individual member States how they decide to progress in regulation of N_2O emissions and Achema JI project PDD clearly states, that if there would be any changes to N_2O regulatory levels, then these levels would become new baseline level.

DETERMINATION REPORT

Furthermore, the following information was made available regarding the IPPC Directive 96/61/EC Implementation in Lithuania in relation to N_2O emission reduction JI Project in Achema:

- 28 December 2004 – Achema received the IPPC permit No. 2/15-04 issued by the Kaunas Regionale Environmental Department for the production of nitric acid in UKL-7 and GP plants. The IPPC permit does not contain any information about permitted N_2O emission level.
- A letter addressed to Achema from the Lithuania Republic Environmental Ministry Kaunas Regional Environmental Department stating no limits on N_2O emissions are included in the IPPC permit No. 2/15-04, issued to SC ”Achema” in 28-12-2004. Dated 25 January 2008 /22/.
- Lithuanian authorities have not developed yet a clear policy regarding implementation of BAT/BREF reference indications /21/.
- 30 April 2008 –Achema received updated IPPC permit defining mass N_2O lmits for the project crediting period years. These limits imposed on Achema until 2013 are higher than the present levels of N_2O emissions prior to the installation of secondary N_2O abatement catalyst and thus the host country does not require any abatement of nitrous oxide before 2013 /22/.
- Vertis Environmental Finance Poland Sp. z o.o. and the Achema Group Environmental representative has not recognised any other formal motions undertaken by companies or institutions in this field.

According to the CDM methodology the monitoring plan for the project includes a check of legislation changes, and in case of introduction of any new limits for N_2O emissions either concentration or mass limits of N_2O emissions, the baseline scenario emission factor will be re-assessed according to new regulations at the time of enforcement.

APPENDIX A

JI DETERMINATION PROTOCOL

Table 1 Mandatory Requirements for Joint Implementation (JI) Project Activities

Requirement	Reference	Conclusion
The project shall have the approval of the Parties involved	Kyoto Protocol Article 6.1 (a)	~~CAR 1~~ OK
Emission reductions, or an enhancement of removal by sinks, shall be additional to any that would otherwise occur	Kyoto Protocol Article 6.1 (b)	OK
The sponsor Party shall not acquire emission reduction units if it is not in compliance with its obligations under Articles 5 & 7	Kyoto Protocol Article 6.1 (c)	N/A Sponsor Party not yet identified
The acquisition of emission reduction units shall be supplemental to domestic actions for the purpose of meeting commitments under Article 3	Kyoto Protocol Article 6.1 (d)	N/A Sponsor Party not yet identified
Parties participating in JI shall designate national focal points for approving JI projects and have in place national guidelines and procedures for the approval of JI projects	Marrakech Accords, JI Modalities, §20	OK Lithuania has designated a focal point and has national guidelines and procedures in place for the approval of JI projects.
The host Party shall be a Party to the Kyoto Protocol	Marrakech Accords, JI Modalities, §21(a)/24	OK The Kyoto Protocol was ratified by Lithuania on 3 January 2003
The host Party's assigned amount shall have been calculated and recorded in accordance with the modalities for the accounting of assigned amounts	Marrakech Accords, JI Modalities, §21(b)/24	OK National Inventory Reports (UNFCCC website).
The host Party shall have in place a national registry in accordance with Article 7, paragraph 4	Marrakech Accords, JI Modalities, §21(d)/24	OK National Inventory Reports (UNFCCC website).
Project participants shall submit to the independent entity a project design	Marrakech Accords,	OK

Requirement	Reference	Conclusion
document that contains all information needed for the determination	JI Modalities, §31	
The project design document shall be made publicly available and Parties, stakeholders and UNFCCC accredited observers shall be invited to, within 30 days, provide comments	Marrakech Accords, JI Modalities, §32	OK Commenting period from 23 Oct 07 to 21 Nov 07 Ref. no. 0089
Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, in accordance with procedures as determined by the host Party 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	Marrakech Accords, JI Modalities, §33(d)	OK Achema AB has an IPPC permit, no other EIA is required by host party regulations.
The baseline for a JI project shall be the scenario that reasonably represents the GHG emissions or removal by sources that would occur in absence of the proposed project	Marrakech Accords, JI Modalities, Appendix B	OK Table 2
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	Marrakech Accords, JI Modalities, Appendix B	OK Table 2
The baseline methodology shall exclude to earn emission reductions for decreases in activity levels outside the project activity or due to force majeure	Marrakech Accords, JI Modalities, Appendix B	OK Table 2
The project shall have an appropriate monitoring plan	Marrakech Accords, JI Modalities, §33(c)	~~CL 7- CL 14~~ ~~See table 2 section D.~~ OK

Table 2 Requirements Checklist

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
A. General Description of Project Activity *The project design is assessed.*					
Project Boundaries *Project Boundaries are the limits and borders defining the GHG emission reduction project.*					
Are the project's spatial boundaries (geographical) clearly defined?	/1/	DR	Yes, the project boundaries are clearly defined. The N_2O abatement installation will be located in the existing nitric acid plant (NAP) at the Achema AB nitric acid plant, Jonavos region, Lithuania. The inlet of ammonia into the ammonia oxidation reactors of the eight lines is the first point in the project boundary and the gas emission from the stacks is the last point in the nitric acid production process included into the project boundary.		OK
Are the project's system boundaries (components and facilities used to mitigate GHGs) clearly defined?	/1/	DR	All components and facilities used for this project are clearly described in the PDD and are located in the existing NAP facility. The project applies only for emission reductions from the direct N_2O reductions from existing NAP. There are no indirect reductions from outside of the project facility.		OK
Participation Requirements *Referring to Part A and Annex 1 of the PDD as well as the JI glossary with respect to the terms Party, Letter of*					

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
Approval, Authorization and Project Participant.					
Which Parties and project participants are participating in the project?	/1/	DR	Lithuania is the host Party. There are two private entities involved: Achema AB (Project Owner) and Vertis Environmental Finance Poland Sp. z o.o. (JI Project Advisor).		OK
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?	/9/	DR	A Letter of Endorsement was issued on 8 January 2007 by the Ministry of Environment of the Republic of Lithuania. No Letter of Approval has been issued for the project.	~~CAR 1~~	OK
Technology to be employed *Determination of project technology focuses on the project engineering, choice of technology and competence/ maintenance needs. The AIE should ensure that environmentally safe and sound technology and know-how is used.*					
Does the project design engineering reflect current good practices?	/1/	DR	The project involves the installation of a secondary catalyst in eight the ammonia oxidation reactors (burners) in the nitric acid production process to abate nitrous. The project does not involve any major changes with regard to the manufacturing technology and reflects current good practices.		OK
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	This project activity uses a secondary catalyst that has the property of decomposing N_2O. The secondary catalyst causes approximately	~~CL 1~~	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			from 70% up to 95% of the N_2O to be destroyed The selection of secondary catalyst technology suppliers were at the time of the site visit not selected. Evidence of abatement efficiency should be provided at the time available in order to justify the assumption made when estimating the emission reductions.		
Does the project make provisions for meeting training and maintenance needs?	/1/ /26/ /27/ /28/	DR I	DNV was provided with additional evidence related to training of maintenance personnel for the monitoring equipment (training certificates). However, there are no established procedures and responsibilities found to ensure that the personnel operating the monitoring equipment is continuously competent and has appropriate training. This is also a requirement of ISO9001 and 14001 and it should be considered to implement the training needs of this JI project into the management system procedure for training.	~~CL 2~~	OK
B. Project Baseline *The determination of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.*					
Baseline Methodology *It is assessed whether the project applies an appropriate*					

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
baseline methodology.					
Is the discussion and selection of the baseline methodology transparent?	/1/	DR I	The baseline methodology is according to the AM0034 v02 methodology. However some adjustments are made. This applies to the use of overlapping of consecutive campaigns for the determination of the baseline factor. Since the primary catalyst and operating conditions during the first campaign are materially the same as those for subsequent campaign, this approach is regarded appropriate. However a more detailed description is required for the situation where the length of the baseline campaign is longer than the determined historical campaign. Further the justification of the approach should be included in the final PDD.	~~CL 3~~	OK
Does the baseline methodology specify data sources and assumptions?	/1/	DR I	Yes, data sources are clearly identified, and this will be project specific measurements of the baseline campaign according to AM0034 v02 and referenced in PDD table D.1.1.3. However the source of the design capacity as per 31 December 2005 as presented at the site visit should be made available and referenced in the final PDD section D.1.4. The permitted operating ranges are determined from the operating manuals since historical data was not available. However the ranges included in the updated PDD is	~~CL 4~~	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			not consistent to the documentation made available from the operating manual. Further the data for determination of the historical campaign length (CL_{normal}) is provided for 5 historical campaigns; however the calculated historical average (CL_{normal}) is not included in documentation. The provided information for the primary catalyst for historical and baseline campaigns are not complete. The above issues should be clarified/corrected and included in the final PDD.		
Does the baseline methodology sufficiently describe the underlying rationale for the algorithm/formulae used to determine baseline emissions (e.g. marginal vs. average, etc.)	/1/	DR	Yes, the baseline methodology sufficiently describes the underlying rationale for algorithm/formulae used to determine baseline emissions.		OK
Does the baseline methodology specify types of variables used (e.g. fuels used, fuel consumption rates, etc)?	/1/	DR	Yes, all variables are described in tables D.1.1.1 and D.1.1.3 of the PDD.		OK
Does the baseline methodology specify the spatial level of data (local, regional, national)?	/1/		Yes, all data are project specific. Only N_2O emissions level set by incoming policies or regulations will be monitored as a national level of data.		OK
Baseline Scenario Determination *The choice of the baseline scenario will be validated with focus on whether the baseline is a likely scenario, and*					

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
whether the methodology to define the baseline scenario has been followed in a complete and transparent manner.					
What is the baseline scenario?	/1/	DR	The baseline scenario has been defined as the continuation of the current situation, where there will be no installation of technology for the destruction or abatement of N_2O.		OK
What other alternative scenarios have been considered and why is the selected scenario the most likely one?	/1/ /22/	DR I	The selection of the most likely baseline scenario has been assessed according to AM0028 version 4.1 ***Step 1a*** of the baseline scenario identification includes listing of all technically feasible alternatives to the given project. The principal theoretical alternatives to the project are: ▪ Continuing to operate the plant as is ▪ Switch to alternative production method not involving ammonia oxidation process ▪ Alternative use of N_2O such as: -Recycling of N_2O as a feedstock for the plant -The use of N_2O for external purposes ▪ Installation of Non-Selective Catalytic Reduction (NSCR) De-NO_x system ▪ Installation of N_2O abatement not as a JI project ▪ Installation of an N_2O destruction or abatement technology: -Tertiary measure for N_2O destruction		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			-Primary or secondary measures for N_2O destruction or abatement ***Step 1b*** includes all possible technically feasible options to handle NO_x emissions. Non-Selective De-NO_x units cause also reduction of N_2O and thus it is necessary to elaborate also on this technical option. Possibilities regarding NO_x emissions are as following: ▪ Continuation of the current situation, whether either De-NO_x units is installed or not ▪ Installation of new Selective Catalytic Reduction De-NO_x unit ▪ Installation of a new Non-Selective Catalytic reduction (NCSR) De-NO_x unit ▪ Installation of a new tertiary measure that combines NO_x and N_2O emission reduction ***Step 2*** includes the elimination of baseline alternatives that do not comply with legal or regulatory requirements. There are no regulatory requirements in Lithuania regarding N_2O emissions. NO_x emissions are regulated by the Approval of Integrated Pollution Prevention and Control No. 4/15-04 (IPPC) requiring keeping concentration of NO_x emissions below 50 ppmV level.		

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			Achema has installed at all 8 production lines Selective Catalytic Reduction De-NO_x units. No alternatives were excluded at this step. ***Step 3*** includes the elimination of baseline alternatives that face prohibitive barriers (barrier analysis). ***Step 3 a*** As there is no barrier in form of no access to international capital markets, lack of infrastructure or lack of skilled personnel as Achema is capable of implementing and operating a de-N_2O project. Thus technology barriers related to technology and operational risk are assessed for the different alternatives. The information presented are reasonable. ***Step 3b*** Based on the information provided in step 3a (which is regarded reasonable), the following alternatives were eliminated. ▪ Switch to alternative production method not involving ammonia oxidation process ▪ Alternative use of N_2O such as: -Recycling of N_2O as a feedstock for the plant -The use of N_2O for external purposes ▪ Installation of Non-Selective Catalytic Reduction (NSCR) De-NO_x system ▪ Installation of N_2O abatement not as a		

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			JI project ▪ Installation of an N_2O destruction or abatement technology: -Tertiary measure for N_2O destruction -Primary measures for N_2O destruction or abatement ***Step 4**:* Identification of the most economically attractive baseline scenario alternative. From the analysis in step 3 the only remaining alternative achieving N_2O emission reduction, other than continuation of status quo, is secondary catalytic reduction of N_2O in existing reaction chambers of ammonia oxidation reactors. The defined baseline meets current regulations, and requires no additional investments or additional operating costs. A simple cost analysis is thus not necessary since it is only one alternative after elimination of other alternatives in step 3. ***Step 5*** Re-assessment of Baseline Scenario in course of proposed project activity's lifetime. This step is sufficiently included in the PDD.		
Has the baseline scenario been determined according to the methodology?	/1/	DR	Yes, the baseline methodology is prepared according to the AM0034 v02; however, there are some discrepancies (see CL 2 above).	~~CL 2~~	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
Has the baseline scenario been determined using conservative assumptions where possible?	/1/	DR	Baseline scenario is defined as the continuation of the status quo. The determination is based on reasonable arguments and analysis.		OK
Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1/	DR I	Yes, in Lithuania there is currently no regulation on N_2O emissions. Imposing of IPPC Directive limits on N_2O emissions is possible during the crediting period; however regulation changes will be monitored and be taken into account during verifications. Presently Achema AB holds an IPPC permit, which is not limiting N_2O emissions. NO_x emissions are regulated by the Approval of Integrated Pollution Prevention and Control No. 4/15-04 (IPPC) requiring keeping concentration of NO_x emissions below 50 ppmv level. Achema has installed at all 8 production lines Selective Catalytic Reduction (SCR) De-NO_x units. The measurements of NO_x where made available at the site visit however the present level of NO_x emissions should be clearly stated in the final PDD.	~~CL 5~~	OK
Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?	/1/	DR	Yes.		OK
Have the major risks to the baseline been identified?		DR	The methodology takes into account the		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			possible risk of changing regulation with proper adjustments to the baseline N_2O emission.		
Additionality Determination *The assessment of additionality will be validated with focus on whether the project itself is not a likely baseline scenario.*					
What is the methodology selected to demonstrate additionality?	/1/	DR	The "Tool for the demonstration and assessment of additionality" (version 3) has been used to demonstrate additionality. However a new version 4 is now available and the final PDD should be adjusted accordingly.	~~CL 6~~	OK
Is the project additionality assessed according to the methodology?	/1/	DR	Yes.		OK
Are all assumptions stated in a transparent and conservative manner?	/1/	DR	Yes.		OK
Is sufficient evidence provided to support the relevance of the arguments made?	/1/ /18/	DR	Yes. The project additionality is demonstrated by applying the "Tool for the demonstration and assessment of additionality" (version 03) ***Step 1*** Identification of alternatives to the project activity consistent with current laws and regulations. This step has been omitted because this step is covered in B.1 in the PDD.	~~CL 6~~	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			Step 2 - Investment analysis As catalytic N_2O destruction facilities generate no financial or economical benefits other than JI related income, a simple investment analysis is applied. The proposed JI project activity is, without the revenues from the sale of ERU's, less economically and financially attractive than the baseline scenario. The investment analysis provided shows that the only revenue arises from sales of ERU's. The investment consists of the engineering, construction, shipping, installation and commissioning of the secondary catalyst and the measurement equipment. The operating costs consist of the regular change of the catalyst as well as personnel costs for the supervision of the measurement equipment. DNV received business case model calculations. ***Step 3*** - Barrier analysis: A barrier analysis is not used for demonstrating additionality in this project. ***Step 4*** - Common practice analysis: N_2O secondary abatement is not regareded a common practice in Lithuania. Usually, the nitric acid industry releases into the atmosphere the N_2O generated as a by-		

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			product of the nitric acid production, as it does not have any economic value or toxicity at typical emission levels. The project proponent is however requested to include in the PDD and assessment of the nitric acid plants in Lithuania or the Baltics whether these plants have installed N_2O abatement technologies.		
C. Duration of the Project/ Crediting Period *It is assessed whether the temporary boundaries of the project are clearly defined.*					
Are the project's starting date and operational lifetime clearly defined and evidenced?	/1/		Yes, the starting date is December 2006 and the project is expected to operate beyond 2012.		OK
Is the start of the crediting period clearly defined and reasonable?	/1/		In the PDD section C.3, the crediting period is stated to start 1 January 2008, during the site visit AIE has been informed that, the secondary catalyst is scheduled to be installed in the period March to May 2008.		OK
D. Monitoring Methodology *It is assessed whether the project applies an appropriate baseline methodology.*					
Is the monitoring plan documented according to the chosen methodology and in a complete and transparent manner?	/1/	DR	Yes, however, the proportion of the data to be monitored for N_2O concentration are not 100% (as required by AM0034 v.02) since the project is applying three switched concentration meters. An analysis is performed to investigate the consequence of	~~CL 7~~	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			this approach. This analysis shows a difference between a 100% proportion of data monitored and a 24% proportion of data monitored of 0.58%. Thus this is not regarded material. The proportion of data monitored as a consequence of the switching system is estimated to be 24% for line 1-6 and 36% for line 7 and 8. The final proportion of data monitored will be defined after the completion of the baseline campaign measurements. The justification of the approach is explained to be the capacity of the hardware. However the justification of the approach needs to be included in the final PDD.		
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 ERUs, for this project activity, whichever occurs later?	/1/	DR	Monitoring data will be archived according to the AM0034 v.02 methodology, which does require archiving of the baseline data for the entire crediting period (except for ammonia oxidation parameters which will be archived for at least 2 years) and for project data for a period of at least 2 years. It should be amended to be in accordance to the requirement of archiving the data for a period of 2 years after the end of the crediting period or the last issuance of ERUs.	~~CL 8~~	OK
Monitoring of Project Emissions *It is established whether the monitoring plan provides for*					

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
reliable and complete project emission data over time.					
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	Yes, the monitoring plan provides 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. However, the responsibility for monitoring of possible changes in regulations of N_2O emission levels has not been clearly identified in the PDD.	~~CL 9~~	OK
Are the choices of project GHG indicators reasonable and conservative?	/1/	DR	Yes, N_2O is the only GHG indicator that is to be accounted for. According to the methodology, all data for this indicator are on a project specific basis.		OK
Is the measurement *method* clearly stated for each GHG value to be monitored and deemed appropriate?	/1/ /28/ /30/ /31/	DR	Yes, the measurement methods are presented in the PDD and in the ECM ECO Monitoring documents provided.		OK
Is the measurement *equipment* described and deemed appropriate?	/1/ /31/	DR	Yes. Relevant equipment is described and planned to meet EN 14181 requirements.		OK
Is the measurement *accuracy* addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?	/1/ /27/ /31/	DR	The accuracy of the N_2O analyser and stack gas flow meter is given. However, a QAL 2 tests are to be conducted and the results from the tests need to be accounted for and the final overall	~~CL 10~~	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			uncertainty (UNC as described in AM0034) will then be determined. The estimated overall uncertainty is taking into account the uncertainty of the N_2O analyser, stack gas flow meter and the measurement of nitric acid produced. The value is given to be 4.88%. However the uncertainty of the calibration gas used for N_2O analyser seems not to be included. The description of the implementation of QAL 3 is described in the ECM ECO monitoring documents, however the monitoring plan (Annex 3) do not address QAL 3 sufficiently. Further the procedure on how to deal with erroneous measurements is not sufficiently addressed. This should be included in a relevant procedure and described in the final PDD.		
Is the measurement *interval* identified and deemed appropriate?	/1/	DR	Yes. However see CL 7.	~~CL 7~~	OK
Is the *registration, monitoring, measurement* and *reporting* procedure defined?	/1/ /31/	DR I	The PDD and the "Operation and maintenance manual N_2O emission monitoring system Achema plant Lithuania" developed by ECM ECO Monitoring describe an automatic process of data monitoring, acquisition and archiving is performed by the computer system; however, responsibilities e.g. for final monitoring	~~CL 11~~	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			report preparation are not indicated.		
Are procedures identified for *maintenance* of monitoring equipment and installations? Are the calibration intervals being observed?	/1/ /31/	DR I	Yes, it has been confirmed during the site visit, additionally a procedure for the maintenance of the monitoring equipment is described in the ECM ECO monitoring documents.		OK
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/ /31/		The description of data acquisition, processing, presentation and archiving is described in the "Operation and maintenance manual N_2O emission monitoring system Achema plant Lithuania" developed by ECM ECO Monitoring. However such procedures are planned to be incorporated into the existing management system.	~~CL 12~~	OK
Monitoring of Baseline Emissions *It is established whether the monitoring plan provides for reliable and complete baseline emission data over time.*					
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	Yes, dataset is according to AM0034 v02.		OK
Are the choices of baseline GHG indicators reasonable and conservative?	/1/	DR	Yes, GHG indicators are reasonable and conservative. Change of the baseline is expected in case of the regulations change to assure the conservativeness of the approach.		OK
Is the measurement *method* clearly stated for each baseline indicator to be monitored and also deemed appropriate?	/1/	DR I	Yes, the measurement methods are presented in tables D.1.1.3 and D.1.1. of the PDD and		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			are deemed appropriate. Presently ongoing campaigns, which will be used for setting the baseline, are using flow measurement and all necessary monitoring equipment is installed and in operation.		
Is the measurement *equipment* described and deemed appropriate?	/1/ /31/	DR	Yes. Relevant equipment is described and deemed appropriate. However, the description of the equipment used to measure ammonia oxidation temperature and pressure, ammonia and air flow is not sufficiently described in the monitoring plan.	~~CL 13~~	OK
Is the measurement *accuracy* addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?	/1/	DR I	Yes. However QAL 2 documents for the monitoring equipment were not ready at the time of the site visit (see CL 10 above). The final determination of the overall uncertainty should be checked during emission reduction verification, further it should be checked that the uncertainty is taken into account in calculations as described in AM0034 v2.	~~CL 10~~	OK
Is the measurement *interval* for baseline data identified and deemed appropriate?	/1/	DR	Yes, however see CL 7.	~~CL 7~~	OK
Is the *registration*, *monitoring*, *measurement* and *reporting* procedure defined?	/1/ /31/	DR I	The PDD and the "Operation and maintenance manual N_2O emission monitoring system Achema plant Lithuania"	~~CL 11~~	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			developed by ECM ECO Monitoring describe an automatic process of data monitoring, acquisition and archiving is performed by the computer system; however, responsibilities e.g. for final monitoring report preparation are not indicated.		
Are procedures identified for *maintenance* of monitoring equipment and installations? Are the calibration intervals being observed?	/1/ /31/	DR I	Yes, it has been confirmed during the site visit, additionally a procedure for the maintenance of the monitoring equipment is described in the ECM ECO monitoring documents. The maintenance procedures for the ammonia oxidation parameters shall follow the existing procedures for the operation of the nitric acid plan; however this information is not sufficiently addressed in the PDD.	~~CL 13~~	OK
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/ /31/	DR I	The description of data acquisition, processing, presentation and archiving is described in the "Operation and maintenance manual N_2O emission monitoring system Achema plant Lithuania" developed by ECM ECO Monitoring. However such procedures are planned to be incorporated into the existing management system and should be prepared prior to the first verification.	~~CL 12~~	OK
Monitoring of Leakage *It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.*					

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/4/	DR	According to AM0034, leakage is not to be considered.		
Are the choices of project leakage indicators reasonable and conservative?	/4/	DR	According to AM0034, leakage is not to be considered.		
Is the measurement *method* clearly stated for each leakage value to be monitored and deemed appropriate?	/4/	DR	According to AM0034, leakage is not to be considered.		
Project Management Planning *It is checked that project implementation is properly prepared for and that critical arrangements are addressed.*					
Is the authority and responsibility of overall project management clearly described?	/1/	DR I	Sistematika"a subsidiary of SC"Achema" is in charge of operation and maintenance of the N_2O monitoring system. The Nitric acid production department is responsible for the N_2O monitoring and for reporting faults in the operation of the monitoring system to "Sistematika". However, no reference is made to other aspects like internal audits of system and data, corrective and preventive actions.	~~CL 14~~	OK
Are procedures identified for training of monitoring personnel?	/1/	DR I	Training records of operating personnel have been presented during the site visit; however, there was no procedure that would assure competence requirements to be sustained (e.g. responsibilities for training of new	~~CL 12~~	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			maintenance personnel).		
Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/	DR I	Procedures for emergency preparedness for cases where emergencies can cause unintended emissions have not been addressed.	~~CL 12~~	OK
Are procedures identified for review of reported results/data?	/1/	DR I	The procedures described in PDD are related only to automatic checking of data by monitoring system. No description related to responsibilities for review of final report, calculation etc. is developed.	~~CL 12~~	OK
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 addressed.	~~CL 12~~	OK
E. Calculation of GHG Emissions by Source *It is assessed whether all material GHG emission sources are addressed and how sensitivities and data uncertainties have been addressed to arrive at conservative estimates of projected emission reductions.*					
Calculation of GHG Emission Reductions – Project emissions *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.*					
Are the calculations documented according to the chosen methodology and in a complete and transparent manner?	/1/	DR I	The formulas described in section D.1.1.2 and D.1.1.4 of the PDD are in accordance to AM0034 v.2. The baseline data is given in Annex 2. The calculations are based on data		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			available at the time of preparation of the PDD, however since baseline campaign monitoring are not finalized the calculations will be finalised when the monitoring is complete and the final calculations are subject of verification. Preliminary data has been provided.		
Have conservative assumptions been used when calculating the project emissions?	/1/ /4/	DR	Yes, all assumptions are in line with AM0034 v.02 methodology.		OK
Are uncertainties in the project emission estimates properly addressed?	/27/ /12/ /13/	DR	Yes. The accuracy of the N_2O analyser and stack gas flow meter is given in QAL1 certificates and ECM ECO Monitoring document No. 0105/07-287/2006. However a QAL 2 test is to be conducted and results from the test to be accounted for and the overall uncertainty (UNC as described in AM0034) is to be determined and verified by the verifying AIE.		OK
Calculation of GHG Emission Reductions – Baseline emissions *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.*					
Are the calculations documented according to the chosen methodology and in a complete and transparent manner?	/33/	DR	Yes.		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
Have conservative assumptions been used when calculating the baseline emissions?	/1/ /30/	DR	Yes. The basis for the baseline emission data will be the measurement results from the N_2O analyzer Xentra 4900 analyzer from Servomex , the tail gas flow meter Ultrasonic D-FL 200 and the nitric acid data from the flow meter and the on line refractory meter. The baseline campaign measurements are subject to verification by the verifying AIE.		OK
Are uncertainties in the baseline emission estimates properly addressed?	/27/	DR	The overall uncertainty of the monitoring system shall be determined and the measurement error will be expressed as a percentage (UNC). The N_2O emission factor per tonne of nitric acid produced in the baseline period (EF_{BL}) shall then be reduced by the estimated percentage error. The overall UNC needs to be verified by the verifying AIE.		OK
Calculation of GHG Emission Reductions – Leakage *It is assessed whether leakage emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.*					
Are the leakage calculations documented according to the chosen methodology and in a complete and transparent manner?	/4/	DR	According to AM0034, leakage is not to be considered.		OK
Have conservative assumptions been used when calculating the leakage emissions?	/4/	DR	According to AM0034, leakage is not to be considered.		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
Are uncertainties in the leakage emission estimates properly addressed?	/4/	DR	According to AM0034, leakage is not to be considered.		OK
Emission Reductions *The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.*					
Are the emission reductions real, measurable and give long-term benefits related to the mitigation of climate change.	/1/	DR	Yes, emission reductions are real, measurable and give long-term benefits related to the mitigation of climate change. The implemented monitoring methodology and measurement system allow for calculation of real project specific emission reductions.		OK
F. Environmental Impacts *Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the AIE.*					
Has an analysis of the environmental impacts of the project activity been sufficiently described?	/1/ /23/	DR I	The project is not expected to have any adverse environmental impact.		OK
Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	/23/ /22/	DR	Achema AB is operating according to the permit (based on IPPC) issued by Kaunas Regional Environmental Department 28 December 2004 and latest renewed 17 April 2007. Further update of the IPPC permit was received 30 April 2008, however the leves of N_2O imposed until 2013 are below		OK

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			the present levels of N_2O emissions prior to installation of secondary catalysts. According to Kaunas Regional Environmental Department an Environmental Impact Assessment (EIA) is not mandatory.		
Will the project create any adverse environmental effects?	/1/ /2/	DR I	The project is not expected to affect the environment in any adverse way. At the time of the site visit the supplier of catalyst was not yet selected thus it should be clarified after the selection of the supplier if there is a risk for potential catalyst waste.	~~CL 15~~	OK
Are transboundary environmental impacts considered in the analysis?	/1/ /2/	DR I	There are no transboundary environmental impacts. See CL 15.	~~CL 15~~	OK
Have identified environmental impacts been addressed in the project design?	/1/ /2/	DR I	The project does not have any adverse environment impact.		OK
Does the project comply with environmental legislation in the host country?	/1/ /2/	DR I	Yes.		OK
G. Stakeholder Comments *If required by the host country, the AIE should ensure that stakeholder comments have been invited with appropriate media and that due account has been taken of any comments received.*					
Have relevant stakeholders been consulted?	/1/ /20/	DR I	There is no host country requirement for stakeholder comments. Neither public nor any community will be affected or likely to be affected by the project		OK

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			and therefore the project developer did not conduct stakeholder consultations. However a letter was sent to the Mayor of Municipality of Jonava City with reference to the project documents for the information of the project. In response to this, a letter dated 28 November 2007, stating a positive feedback to the implementation of the JI project was received.		
Have appropriate media been used to invite comments by local stakeholders?			See above.		OK
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?			See above.		OK
Is a summary of the stakeholder comments received provided?			See above.		OK
Has due account been taken of any stakeholder comments received?			See above.		OK

Table 2 Resolution of Corrective Action and Clarification Requests

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in table 2	Summary of project owner response	Determination team conclusion
CAR 1 A Letter of Endorsement was issued on 8 January 2007 by the Ministry of Environment of the Republic of Lithuania. No Letter of Approval has been issued for the project.	A	Letter of Approval by Lithuanian Ministry of Environment will be issued after issuance of final determination report.	DNV has received the approval of voluntary participation and approval from Lithuania. /9/. This CAR is closed.
CL 1 This project activity uses a secondary catalyst that has the property of decomposing N_2O. The secondary catalyst causes approximately from 70% up to 95% of the N_2O to be destroyed The suppliers were at the time of the site visit not selected. Evidence of abatement efficiency should be provided at the time available in order to justify the assumption made when estimating the emission reductions.	A	In the PDD and emission reductions estimates project uses estimated abatement efficiency 70%, which is conservative approach based on estimated abatement levels provided by suppliers of secondary catalysts for the UKL-7 nitric acid plant (8 lines in total) Supplier 1 (70%, 3 lines), Supplier 2 (80%, 3 lines) and Supplier 3 (75-80%, 2 lines).	The information provided is sufficient to justify the assumption made when estimating the emissions reduction. CL 1 is closed.

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in table 2	Summary of project owner response	Determination team conclusion
CL 2 DNV was provided with additional evidence related to training of maintenance personnel for the monitoring equipment (training certificates). However, there are no established procedures and responsibilities found to ensure that the personnel operating the monitoring equipment is continuously competent and has appropriate training. This is also a requirement of ISO9001 and 14001 and it should be considered to implement the training needs of this JI project into the management system procedure for training.	A	Responsibilities for operation of the monitoring system by properly trained and authorized persons are defined in the Annex 5 to the document A-245-07 provided to DNV.	Annex 5 of A-245-07 is including description of the supervision of N_2O monitoring equipment by authorized personnel. The implementation of the procedures will be subject to verification by the verifying DOE. CL 2 is closed.
CL 3 The baseline methodology is according to the AM0034 v02 methodology. However some adjustments are made. This applies to the use of overlapping of consecutive campaigns for the determination of the baseline factor. Since the primary catalyst and operating conditions during the first campaign are materially the same as those for the subsequent campaign, this approach is regarded appropriate. However a more detailed description is required for the situation where the length of the baseline campaign is longer than the determined historical campaign. Further the justification of the approach should be included in the final PDD.	B	Definition of overlapping approach is to be found in the PDD on page 11. Project will calculate final baseline study at time of first emission report verification. It will most likely be the case that on some lines project could use standard one single campaign baseline measurement approach, but project wants to keep also possibility to use sound overlapping approach. Calculation of historic campaign length per each line have been provided to DNV.	The description of the method of calculating baseline emission factor from overlapping campaigns is included in the revised PDD. CL 3 is closed.
CL 4 Data sources for the baseline methodology are	B	Nameplate capacity is 2,800 HNO3 100% per day.	The nameplate capacity of 350 metric tons 100% nitric acid per day per line; in total

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in table 2	Summary of project owner response	Determination team conclusion
clearly identified, and this will be project specific measurements of the baseline campaign according to AM0034 v02 and referenced in PDD table D.1.1.3. However the source of the design capacity as per 31 December 2005 as presented at the site visit should be made available and referenced in the final PDD section D.1.4. The permitted operating ranges are determined from the operating manuals since historical data was not available. However the ranges included in the updated PDD is not consistent to the documentation made available from the operating manual. Further the data for determination of the historical campaign length (CL_{normal}) is provided for 5 historical campaigns; however the calculated historical average (CL_{normal}) is not included in documentation. The provided information for the primary catalyst for historical and baseline campaigns are not complete. The above issues should be clarified/corrected and included in the final PDD.		The revised PDD is amended to include the permitted ranges in accordance with the plant operation manual. Data on historic campaign length have been provided to DNV.	2800 metric tons of 100% nitric acid for 8 lines corresponding to a yearly production rate of 1 020 000 tons of 100% nitric acid is included in D.1.4. in the revised PDD. The permitted operating ranges are defined in the revised PDD and correspond to the operating conditions as given in the operating manual. Provided data from operating manual is: -Oxidation temperature range: 880-910 oC -Oxidation pressure range: 0-0.8 MPa -Max. ammonia flow to AOR: 7500 Nm^3/h -Max. ammonia/air ratio: 11.7% Information regarding catalyst suppliers and compositions are provided for historical campaigns and baseline campaigns. The information shows the practice of alternating use of suppliers. Same types of catalyst compositions from the respective suppliers are used. These are 95%Pt/5%Rh; 90%Pt/5%Rh and FTC plus system from the catalyst suppliers Johnson Matthey, Umicore and Heraues. Taking the practice of alternating use of catalyst suppliers installed in the different lines there are no indication of change of catalyst suppliers or

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in table 2	Summary of project owner response	Determination team conclusion
			type of catalyst used in the baseline campaigns compared to the catalyst used in the previous 5 campaigns when assessing all 8 lines. The calculated average of CL_{normal} is provided. The average length for 8 lines is approx. 63 000 tons 100% HNO_3 corresponding to 180 days campaign length at design capacity. Specifically for each line the CLnormal is determined as follows: Line 1: 61 497 t HNO_3 Line 2: 62 682 t HNO_3 Line 3: 59 830 t HNO_3 Line 4: 65 823 t HNO_3 Line 5: 64 817 t HNO_3 Line 6: 61 599 t HNO_3 Line 7: 64 273 t HNO_3 Line 8: 63 619 t HNO_3 The final verification of the permitted ranges, the normal campaign length and catalyst installed are subject to be finally verified by the verifying DOE. CL 4 is closed.

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in table 2	Summary of project owner response	Determination team conclusion
CL 5 NO_x emissions are regulated by the Approval of Integrated Pollution Prevention and Control No. 4/15-04 (IPPC) requiring keeping concentration of NO_x emissions below 50 ppmv level. Achema has installed at all 8 production lines Selective Catalytic Reduction (SCR) De-NO_x units. The measurements of NOx where made available at the site visit however the present level of NOx emissions should be clearly stated in the PDD.	B	Defined in the updated PDD on page 8	The NOx emissions levels are stated in the revised PDD. The emissions of NO_x are confirmed to be below 50 ppm for all eight lines. CL 5 is closed.
CL 6 Common practice analysis: The project proponent is requested to include in the PDD and assessment of the nitric acid plants in Lithuania or the Baltics whether these plants have installed N_2O abatement technologies. Furthermore the "Tool for the demonstration and assessment of additionality" (version 3) has been used to demonstrate additionality. However a new version 4 is now available and the final PDD should be adjusted accordingly.	B	Defined in the updated PDD on page 13. Additionality assessment tool updated from version 3 to version 4.	The revised PDD is updated sufficiently. CL 6 is closed
CL 7 The proportion of data to be monitored for N_2O concentration are not 100% (as required by AM0034 v.02) since the project is applying three switched concentration meters. The justification of this approach needs to be included in the final PDD.	D	Estimate of proportion of N_2O concentration data measured per line is given in tables D.1.1.1. (row P.1) and D.1.1.3. (row B.1). Justification of the switched N2O monitoring can be found on pages 12, 16, 18, 23, 46 and 48 of the PDD.	The nitrous oxide concentration is measured on a switched basis when one N_2O concentration analyser serves 3 production lines due to hardware limitations. The uncertainty due to less frequent monitoring is included in the overall uncertainty. Under-sampling uncertainty is part of both - the project emissions calculations and

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in table 2	Summary of project owner response	Determination team conclusion
			baseline emission factor calculations. CL 7 is closed.
CL 8 Monitoring data will be archived according to the AM0034 v.02 methodology, which does require archiving of the baseline data for the entire crediting period (except for ammonia oxidation parameters which will be archived for at least 2 years) and for project data for a period of at least 2 years. It should be amended to be in accordance to the requirement of archiving the data for a period of 2 years after the end of the crediting period or the last issuance of ERUs.	D	PDD tables D.1.1.1. and D.1.1.3. updated accordingly	The archiving of data is corrected in the revised PDD. CL 8 is closed
CL 9 The monitoring plan provides 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. However, the responsibility for monitoring of possible changes in regulations of N_2O emission levels has not been clearly identified in the PDD.	D	Defined in the PDD on page 36	Control of applicable regulatory level of N_2O on Achema UKL-7 plant is responsibility of Chief of the Achema Environmental Centre. CL 9 is closed.
CL 10 The accuracy of the N_2O analyser and stack gas flow meter is given. However a QAL 2 tests are to be conducted and the results from the tests need to be accounted for	D	Uncertainty to be used for calculation within the JI project is defined in the methodology AM0034 as "Overall uncertainty of the monitoring system (%), calculated as the combined uncertainty of	The final overall uncertainty (UNC) is not available until QAL 2 test is finalised and reported. The UNC is subject to verification by the verifying AIE.

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in table 2	Summary of project owner response	Determination team conclusion
and the final overall uncertainty (UNC as described in AM0034) will then be finally determined. The estimated overall uncertainty is taking into account the uncertainty of the N_2O analyser, stack gas flow meter and the measurement of nitric acid produced. The value is given to be 4.88%. However the uncertainty of the calibration gas used for N_2O analyser seems not to be included. The description of the implementation of QAL 3 is described in the ECM ECO monitoring documents, however the monitoring plan (Annex 3) do not address QAL 3 sufficiently. Further the procedure on how to deal with erroneous measurements is not addressed. This should be included in a relevant procedure and described in the final PDD.		the applied monitoring equipment". Monitoring system is by the methodology AM0034 defined as N_2O analyzer and tail gas flow meter. Uncertainty of the monitoring system is to be defined by the QAL2 report. QAL2 test measurements in accordance with EN14181 have been carried in the Achema UKL-7 plant by certified laboratory in November 2007 and March 2008. Final QAL2 test report has not been delivered yet. After delivery of final QAL2 test report the uncertainty resulting from the QAL2 test specific for each line will be included into baseline calculations and project emission reductions calculations, which will be subject to verification by appropriate AIE. Nitric acid measurement uncertainty is not part of Overall uncertainty of the monitoring system. QAL3 procedures are addressed in the Annex 1 A-245-09 to the plant operation manual "Instrukcija".	Nitric acid is an important parameter directly influencing the baseline and project emissions factors. The uncertainty of this parameter was preliminary estimated to below 0.5% by ECM ECO Monitoring /27/. However the effect on the overall uncertainty (4.88%) is insignificant. Annex 1 of instruction A-245-09 is including the description of QAL 3 procedure and reference to the instruction is included in the revised PDD. CL 10 is closed.
CL 11 The PDD describes an automatic process for data monitoring, acquisition and archiving performed by the computer system. However, responsibilities e.g. for final monitoring report preparation are not	D	Monitoring report is prepared by Vertis based on raw data provided by Achema. The received report from Vertis is reviewed by AIE verifier. Deputy Chief of nitric acid	OK.

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in table 2	Summary of project owner response	Determination team conclusion
indicated.		plant provides Environmental Protection Centre of SC Achema with report reviewed by independent verifier, received from Vertis. Chief of Environmental protection centre presents the report to EPDK (Environmental Protection Department of Kaunas) and LEFI (Lithuanian Environmental Fund of Investments), as set forth in SC Achema methodology on „Greenhouse gas effect" reduction, accounting, control and trade for the period of 2008-2012 and „Kyoto Protocol Implementation Project Procedure Regulations".	CL 11 is closed.
CL 12 Procedures for the JI project is planned to be incorporated into the existing management system. The following procedures should be developed: -Training of monitoring personnel: procedure to assure competence requirements to be sustained (e.g. responsibilities for training of new maintenance personnel). -Procedures for emergency preparedness for cases where emergencies can cause unintended emissions have not been addressed. - Procedures for review of reported results/data. - Procedures for corrective actions in order to provide for more accurate future monitoring and	D	Procedures prepared by Achema on these requests are attached as annexes to the document Instrukcija A-245-07.	Annexes to Instrukcija A A-245-07 include the requested procedures. A separate procedure "Achema data processing procedure" is provided describing the data processing and reporting. However the procedure should be updated to include all required monitoring parameters to ensure completeness prior to the first verification. The implementation and update of these procedures are subject to verification by the verifying AIE.

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in table 2	Summary of project owner response	Determination team conclusion
reporting have not been addressed. - Procedure for data acquisition, processing, presentation and archiving. However such procedures are planned to be incorporated into the existing management system and should be prepared prior to the first verification			CL 12 is closed.
CL 13 Relevant equipment for determination of baseline emissions are described and deemed appropriate. However, the description of the equipment used to measure ammonia oxidation temperature and pressure, ammonia and air flow is not sufficiently described in the monitoring plan. Further the maintenance procedures for the ammonia oxidation parameters shall follow the existing procedures for the operation of the nitric acid plant; however this information is not sufficiently addressed in the PDD.	D	PDD updated accordingly on pages 50-51.	The information about the measurement points and maintenance procedures are included in the PDD. However the information is missing for NH_3 for line 7,8 and for AIFR (air flow). The updated information is received including the required information. CL 13 is closed.

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in table 2	Summary of project owner response	Determination team conclusion
CL 14 Authority and responsibility of overall project management should be clearly defined. No reference is made to other aspects like internal audits of system and data, corrective and preventive actions.	D	Overall project management is responsibility of Achema Technical Director Mr. Juozas Tunaitis. Internal audit procedures are defined in Annex 1 P-000-16 to the internal audit procedures "Vidaus Auditos" Corrective actions are defined in Annex 6 A-245-05 to the plant operation manual "Instrukcija".	The overall responsibility is clarified. The documents provided include internal audit description and corrective actions. CL 14 is closed.
CL 15 The project will not affect the environment in any adverse way. The project owner should seek to clarify if there is a risk for potential catalyst waste.	F	All secondary catalysts installed in the UKL-7 are to be returned to suppliers. Thus there is no risk used secondary catalysts would represent any environmental risk.	OK CL 15 is closed.

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