



VOLUNTARY CARBON STANDARD 2007.1

VALIDATION REPORT

CATALYTIC REDUCTION OF N₂O INSIDE THE AMMONIA BURNERS OF THE NITRIC ACID PLANT IN CAOJING, SHANGHAI

Report No: 8000372692 - 09/208

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Validation Report: Catalytic Reduction of N ₂ O inside the Ammonia Burners of the Nitric Acid Plant in Caojing, Shanghai	M. Saalmann
Client:	Project Title:
Shanghai BASF Polyurethane Co., Ltd.	Catalytic Reduction of N ₂ O inside the Ammonia Burners of the Nitric Acid Plant in Caojing, Shanghai
Summary:	
Shanghai BASF Polyurethane Co., Ltd. via BASF SE has commissioned the TÜV NORD JI / CDM Certification Program to carry out the validation of the Project "Catalytic Reduction of N₂O inside the Ammonia Burners of the Nitric Acid Plant in Caojing, Shanghai" in Shanghai, China with regard to the requirements of VCS 2007.1 Standard. The project activity involves the installation of a secondary N₂O reduction catalyst in the ammonia oxidizer of the nitric acid plant of Shanghai BASF Polyurethane Co., Ltd. In the course of the draft validation 10 Corrective Action Requests (CARs), 6 Clarification Requests (CLs) were successfully closed and 2 Forward Action Requests (FAR) need to be verified during the first periodic verification. The review of the project design documentation and additional documents related to baseline and monitoring methodology and subsequent background investigation have provided the TÜV NORD JI/CDM CP with sufficient evidence to validate the fulfilment of the stated criteria. In detail the conclusions can be summarised as follows: • The project is in line with all relevant host country legislation. • The project additionality is sufficiently justified in the VCS-PD. • The monitoring plan is transparent and adequate. • Deviations from the applied CDM methodology have sufficiently been addressed and justified.	



- The calculation of the project emission reductions is carried out in a transparent and conservative manner, so that the calculated emission reductions of 4,929,000 t CO₂e is most likely to be achieved within the 10 year renewable crediting period.

The conclusions of this report show, that the project, as it is described in the project documentation, is in line with all criteria applicable for the validation against the VCS 2007.1 standard.

Work carried out by:	Number of pages:
R. Winter, Jun Wang	51

Abbreviations

AMS	Automated Measuring System
AST	Annual Surveillance Test
BAU	Business as usual
CA	Corrective Action / Clarification Action
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CO₂	Carbon dioxide
CO_{2e}	Carbon dioxide equivalent
CP	Certification Program
CL	Clarification Request
DNA	Designated National Authority
DCS	Distributed Control System
EB	CDM Executive Board
EIA	Environmental Impact Assessment
ER	Emission Reduction
FAR	Forward Action Request
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
N₂O	Nitrous oxide
NSCR	Non-Selective Catalytic Reduction
QC/QA	Quality control/Quality assurance
SBPC	Shanghai BASF Polyurethane Co., Ltd.
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Voluntary Carbon Standard
VCS - PD	VCS - Project Description
VCU	Voluntary Carbon Unit
VVM	Validation and Verification Manual

Table of Contents	Page
1 INTRODUCTION	7
1.1 Objective.....	7
1.2 Scope	7
1.3 VCS Project Description.....	7
1.3.1 Project Characteristics	7
1.3.2 Project Location	8
1.3.3 Technical Project Description.....	8
1.3.4 Appointment of team members and technical reviewer.....	10
1.4 Level of assurance.....	10
2 METHODOLOGY	12
2.1 Review of Document.....	13
2.2 Follow-up Interviews	13
2.3 Resolution of any material discrepancy	14
3 VALIDATION FINDINGS	15
3.1 Project Design.....	16
3.1.1 Technology.....	16
3.1.2 Project duration, crediting time and project start date	16
3.1.3 Ownership / Proof of title	17
3.1.4 Double Counting	18
3.1.5 Project participation / rejection in other emission trading programme ..	19
3.1.6 VCS Eligibility.....	20
3.1.7 General aspects of the PD	21
3.2 Baseline	24
3.2.1 Approval of the baseline methodology	24
3.2.2 Correct application and justification of selected baseline methodology.....	25
3.2.3 Application of methodology deviations or revisions.....	27
3.2.4 Appropriate setting of baseline scenario	29
3.2.5 Assessment and demonstration of additionality	32
3.3 Monitoring Plan.....	33
3.3.1 Approval of the monitoring methodology.....	33
3.3.2 Correct application and justification of selected monitoring methodology.....	34
3.3.3 Collection and archiving of relevant monitoring data.....	36
3.3.4 Responsibility and authority for monitoring	37
3.4 Calculation of GHG emissions.....	38
3.4.1 Appropriateness of the source, sink and reservoir	38
3.4.2 Correctness and transparency of formulae and factors used	39
3.4.3 Assumptions made for GHG emission reduction estimations	40
3.4.4 Uncertainties	41



3.5	Environmental impact	42
3.6	Comments by stakeholders	42
4	VALIDATION CONCLUSION	44
5	REFERENCES	45

1 INTRODUCTION

1.1 Objective

The purpose of a validation is to have an independent third party assess the project design. In particular the project's baseline, the monitoring plan (MP), and the project's compliance with

- the requirements of the VCS 2007.1;
- the requirements of the approved methodology;
- relevant rules, including the host country legislation

are validated in order to confirm that the project design as documented is sound and reasonable and meets the stated requirements and identified criteria. Validation is seen as necessary to provide assurance to stakeholders on the quality of the project and its intended generation of Voluntary Carbon Units (VCUs).

1.2 Scope

The validation scope is given as a thorough independent and objective assessment of the project design including especially: the correct application of the methodology, the project's baseline study, additionality justification, stakeholder involvement, environmental impacts and monitoring plan, which are included in the PD other relevant supporting documents, to ensure that the proposed VCS project activity meets all relevant and applicable VCS 2007.1 criteria.

The information included in the PD and the supporting documents were reviewed and assessed against the requirements as set out by the VCS 2007.1.

The validation is based on the information made available to TÜV NORD JI/CDM CP and on the contract conditions. TÜV NORD JI/CDM CP can not be held liable by any entities for making its validation opinion based on any false or misleading information supplied to it during the course of validation.

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

1.3 VCS Project Description

1.3.1 Project Characteristics

Essential data of the project is presented in the following Table 1-1.

Table 1-1: Project Characteristics

Item	Data
Project title	Reduction of N ₂ O inside the Ammonia Burners of the Nitric Acid Plant in Caojing, Shanghai
Project owner	Shanghai BASF Polyurethane Co., Ltd.
Any specific project categories	☐ Mega project (> 10 ⁶ t CO _{2eq} / a) ☐ Micro project (< 5000 t CO _{2eq} / a) ☐ AFOLU project ☐ Grouped project ☒ No specific project category
VCS PD dated	Draft: 2009-06-04 Final: -
Applied Methodology	AM0034 version 3.2 (EB 41): "Catalytic Reduction of N ₂ O inside the ammonia burner of nitric acid plants"
Technical Area(s)	Q: N ₂ O
Project starting date	2009-10-01
Crediting period	10 y (renewable)
Start of crediting period	2009-10-01

1.3.2 Project Location

The details of the project location are given in table 1-2:

Table 1-2: Project Location

No.	Project Location
Host Country	China
Region:	Shanghai
Project location address:	No.25 Chu Hua Road Caojing Shanghai zip Code 201507 People's Republic of China
Latitude:	30°47'13'' N
Longitude:	121°27'51'' E

1.3.3 Technical Project Description

The project involves the installation of a secondary N₂O reduction catalyst in the ammonia oxidizer of the nitric acid production plant of Shanghai BASF Polyurethane Co., Ltd.

The emission reductions are a result of the catalytic decomposition of nitrous oxide. Nitrous oxide which is formed as by-product of the nitric acid production will be removed by a secondary catalyst installed directly below the ammonia oxidation gauzes. The nitrous oxide would otherwise be emitted within the tail gas of the nitric acid plant to the atmosphere.

The key parameters of the project are given in table 1-3:

Table 1-3a: Technical data of the project

Parameter	Unit	Value
NH₃ - Oxidizer		
Manufacturer	-	Oschatz, Germany
Diameter	mm	5056
Start of commercial production	-	2006-07-15
Operating conditions as per specifications		
- Temperature (min/max):	°C	830 – 900
- Pressure (min/max):	MPa	0.28 – 0.45
- Ammonia flow rate (max):	t/h	11250 (110 % load)
- Ammonia to Air ratio (max)	Vol.-%	11.35
Ammonia Oxidation Catalyst		
Manufacturer	-	- *)
Composition:	-	Pt: - *) Rd: - *) Pd: - *)
Absorber		
Manufacturer	-	Caldemon Iberica. S.A.
Design capacity	t/a (metric)	265,000
N₂O Analyzer		
Manufacturer	-	ABB
Type	-	AO2240-URAS 26 N2O
Measurement Principle	-	NDIR
Serial No. (at baseline campaign)	-	3.356558.8
Stack volume flow rate measurement		
Manufacturer	-	Dr. Födisch Umweltmesstechnik AG
Type	-	Flow Measuring Device FMD 99
Measurement Principle	-	Differential Pressure

*) The values are considered confidential

Table 1-3b: Parameters confirmed during validation

Parameter	Name	Unit	Value
Operating conditions of the NH ₃ oxidizer during historic campaigns /HOD/			
- Temperature (min/max):	OT _{normal}	°C	857.8 – 875.6
- Pressure (min/max):	OP _{normal}	MPa	0.28 – 0.45
- Ammonia flow rate (max):	AFR _{max}	t/h	11250
- Ammonia to Air ratio (max)	AAR _{max}	Vol.-%	11.35
Historic campaign length	CL _{normal}	t	169,992

*) The values are based on plant records of the historic campaigns as available from 2007-01-01;

1.3.4 Appointment of team members and technical reviewer

On the basis of a competence analysis and individual availabilities a validation team was appointed. Furthermore also the personnel for the technical review and the final approval were determined.

The list of involved personnel, the tasks assigned and the qualification status are summarized in the table 1-4 below.

Table 1-4: Involved Personnel

	Name	Company	Function ¹⁾	Qualification Status ²⁾	Scheme competence	Technical competence ⁴⁾	Host country Competence	Team Leading competence
☒ Mr. ☐ Ms.	Winter, Rainer	TÜV NORD CERT	TL	SA	☒	Q	☐	☒
☐ Mr. ☒ Ms.	Wang, Jun	TÜV NORD CERT	TM	E	☒		☒	☐
☒ Mr. ☐ Ms.	Walter, Ulrich	TÜV NORD CERT	TR ³⁾	E	☒	Q	☐	☐
☒ Mr. ☐ Ms.	Saalmann, Martin	TÜV NORD CERT	FA	SA	☒		☐	☒

¹⁾ TL: Team Leader; TM: Team Member, TR: Technical review; FA: Final approval

²⁾ GHG Auditor Status: A: Assessor; E: Expert; SA: Senior Assessor; T: Trainee; TE: Technical Expert

³⁾ No team member

⁴⁾ As per S01-MU03 or S01-VA070 A2 (such as A, B, C.....)

1.4 Level of assurance

The validation has been planned and organized to achieve a

☒ reasonable level of assurance

☐ limited level of assurance.



2 METHODOLOGY

The validation of the project consisted of the following steps:

- Contract review
- Appointment of team members and technical reviewers
- Publication of the VCS project description (VCS PD)
- A desk review of the VCS PD^{/PD/} submitted by the client and additional supporting documents with the use of customised validation protocol
- Validation planning
- On-Site assessment
- Background investigation and follow-up interviews with personnel of the project developer and its contractors
- Draft validation reporting
- Resolution of corrective actions
- Final validation reporting
- Technical review
- Final approval of the validation.

The sequence of the validation is given in the table 2.1 below:

Table 2.1: Validation sequence

Topic	Time
Assignment of validation	2009-05-26
On-site visit	2009-07-08 to 2009-07-09
Draft reporting finalised	2009-07-10
Final reporting finalised	2010-05-19
Technical review on final reporting finalised	2010-06-20
Final corrections	2010-06-30

The main validation steps are described below.

2.1 Review of Document

The VCS PD ^{/PD/} and supporting background documents related to the project design and baseline were reviewed.

Furthermore, the validation team used additional documentation by third parties like host party legislation, technical reports referring to the project design or to the basic conditions and technical data.

The references used in the course of this validation are summarized in section 5.

2.2 Follow-up Interviews

The validation team has carried out interviews in order to assess the information included in the project documentation and to gain additional information regarding the compliance of the project with the relevant criteria applicable for the VCS.

During validation the validation team has performed interviews to confirm selected information and to resolve issues identified in the document review. The main topics of the interviews are summarized in Table 2-2.

Table 2-2: Interviewed persons and interview topics

Interviewed Persons / Entities	Interview topics
Project proponent representatives Project consultant	- Chronological description of the project activity with documents of key steps of the implementation. - Technical details of the project realization, project feasibility, designing, operational life time, monitoring of the project - Monitoring and measurement equipment and system. - Financial aspects - Deviations - Crediting period - Project activity starting date - Ownership - Baseline study assumptions - Additionality - Monitoring - Analysis of local stakeholder consultation - Roles & responsibilities of the project participants w.r.t. project management, monitoring and reporting - Editorial issues of the VCS PD

A comprehensive list of all interviewed persons is part of section 5 'References'.

2.3 Resolution of any material discrepancy

Material discrepancies identified in the course of the validation are addressed either as CARs, CLs or FARs.

A **Corrective Action Request (CAR)** is established where:

- mistakes have been made in assumptions, application of the methodology or the project documentation which will have a direct influence the project results,
- the requirements deemed relevant for validation of the project with certain characteristics have not been met or
- there is a risk that the project would not be registered or that emission reductions would not be able to be verified and certified.

A **Clarification Request (CL)** will be issued where information is insufficient, unclear or not transparent enough to establish whether a requirement is met.

A **Forward Action Request (FAR)** will be issued when certain issues related to project implementation should be reviewed during the first verification.

A detailed list of the CARs CLs and FAR raised and discussed in the course of this validation is included in the next section 3 of this report.

3 VALIDATION FINDINGS

In this section the assessments and findings from the desk review of the VCS PD, site visit, interviews and supporting documents as well as the final assessments are summarised. Table 3-1 includes an overview of all raised CARs, CLs and FARs.

Table 3-1: Overview of CARs, CLs and FARs issued

No.	Topic / Chapter	CAR	CL	FAR
3.1.1	Technology			
3.1.2	Project duration, crediting time and project start date		1	
3.1.3	Ownership / Proof of title			
3.1.4	Double counting			
3.1.5	Project participation / rejection in other emission trading programme			1
3.1.6	VCS Eligibility			
3.1.7	General Aspects of the PD	1	3	1
3.2.1	Approval of the baseline methodology			
3.2.2	Correct application and justification of selected baseline methodology			
3.2.3	Application of methodology deviations and revisions	1		
3.2.4	Appropriate setting of baseline scenario	4		
3.2.5	Assessment and demonstration of additionality	1		
3.3.1	Approval of the monitoring methodology			
3.3.2	Correct application and approval of selected monitoring methodology	2	1	
3.3.3	Collection and archiving of relevant monitoring data			
3.3.4	Responsibility and authority for monitoring			
3.4.1	Appropriateness of source, sink and reservoir			
3.4.2	Correctness and transparency of formulae and factors used	1	1	
3.4.3	Assumptions made for GHG ER estimations			
3.4.4	Uncertainties			
3.5	Environmental impacts			
3.6	Comments by stakeholders			
-	SUM	10	6	2

3.1 Project Design

3.1.1 Technology

Description

The basic characteristics of the implemented technology have been described in section 1.3.3 of this report. The VCS-PD addresses the project description in sections 1.4 and 1.9. The validation team has checked whether the given description is in line with the site visit findings and the VCS requirements.

Related Findings

- ☒ No CARs, CLs or FARs have been identified in this context
- ☐ The following finding(s) have been addressed:

Final Assessment

The description of the project technology as contained in the VCS-PD is complete and accurate and it provides the reader with a clear understanding of the nature of the project activity.

Moreover additional documentation, such as /OM/, /FMD/ and /PI/, has been provided by the project participant to back up details and technical specifications of the project.

- ☒ The project technology and the description of the same are in line with the applicable VCS criteria.

3.1.2 Project duration, crediting time and project start date

Description

The project lifetime is estimated to be > 30 years. The crediting period starting date expected to start on 2009-10-01. This is the first day the project will most likely start to reduce / remove GHG emissions. Thus, in line with the VCS 2007.1 standard this day is considered to be the starting date of the project.

The project participants have chosen a 10 year renewable crediting period.

Related Findings

- ☐ No CARs, CLs or FARs have been identified in this context
- ☒ The following finding(s) have been addressed:

Finding:	CL 3.1.2-1		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The starting date (as defined in chapter 1 of the VCS standard) shall be included in the VCS-PD.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	A respective statement has been amended (PD, section 1.3): „The anticipated project start date is 1 st October 2009.“		
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	Project start date October 1 st 2009 has been added into the PD version 02 and confirmed by the validation team during onsite visit. Thus CL 3.1.2-1 has been successfully closed.		
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements		

Final Assessment

- ☒ The project duration, crediting time and the project starting date are in line with the applicable VCS criteria.

3.1.3 Ownership / Proof of title

Description

In the VCS-PD SBPC is mentioned as the owner of the project and thus claims the right on the carbon credits derived from this project.

Related Findings

- ☒ No CARs, CLs or FARs have been identified in this context
- ☐ The following finding(s) have been addressed:

Final Assessment

By means of site visit, interviews and checking of corresponding documents like /COS/ and /CIA/ related to the purchase of project equipment it is evidenced that SBPC is the owner of the plant and thus of the current VCS project.

- ☒ The proof of title could be confirmed.

3.1.4 Double Counting

Description

As per the statement of the PP double counting of emission reductions is not to be considered for this kind of project activities in the China.

Related Findings

- ☒ No CARs, CLs or FARs have been identified in this context
- ☐ The following finding(s) have been addressed:

Final Assessment

The plant does not participate in any other mandatory emission trading scheme and considering the type of emission reductions double counting is not to be considered. Nevertheless in case of changes in the legal framework in the future, this needs to be re-assessed.



- ☒ There is (currently) no double counting and thus the project is in line with the requirements of the VCS.

3.1.5 Project participation / rejection in other emission trading programme

Description

This issue is addressed in section 8.2 of the VCS-PD. The PP undertakes that the project does not participate in any other trading programmes.

No information is included that the project has been rejected under any other GHG programme.

Related Findings

- ☐ No CARs, CLs or FARs have been identified in this context
- ☒ The following finding(s) have been addressed:

Finding:	3.1.5-1
Classification	☐ CAR ☐ CL ☒ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The verifier needs to check whether the project takes part in any other GHG programme.
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The project participant offers a written guarantee that the project will not be registered under any other GHG programme. As proof to this shall serve the existing registries of the relevant programmes
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	-
Conclusion <i>Tick the appropriate checkbox</i>	☒ To be checked during the first periodic verification ☐ Appropriate action was taken ☐ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements



Final Assessment

The project is not eligible under the JI / CDM. During interview and website investigation no evidences were found that the project was rejected under any other GHG programme.

At this stage of the project the undertaking as described in the PD is considered to be sufficient proof that the project does not participate in any other GHG programmes. Nevertheless this issue shall be re-assessed in the course of verification. Thus a corresponding FAR has been raised.

☒ The project is in line with the VCS requirements w.r.t. this issue.

3.1.6 VCS Eligibility

Description

As per information provided by the PP the project meets all VCS eligibility criteria. The validation team has checked the project activity against the applicable criteria.

Related Findings

- ☒ No CARs, CLs or FARs have been identified in this context
- ☐ The following finding(s) have been addressed:

Final Assessment

As

- the project starting date is after 2002-01-01
- the reduced GHG is one of the 6 Kyoto gases
- an approved CDM methodology was used
- the validation started after 2008-11-18
- the crediting period starts after 2006-03-28

the validation team arrives at the conclusion that all applicable eligibility criteria are



met.

☒ The project meets all VCS eligibility criteria.

3.1.7 General aspects of the PD

Description

The PD has been drafted on the basis of the VCS PD template ^{/VCS-PD-T/} as available on the VCS website. The validation team has checked whether this template has been duly filled and if all aspects have been appropriately addressed.

Related Findings

☐ No CARs, CLs or FARs have been identified in this context

☒ The following finding(s) have been addressed:

Finding:	3.1.7-1		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The concentration values given in section 1.9 are not consistent with the reduction efficiency of 85 % as given on page 3 of the VCS-PD.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	PD section 1.9 has been adjusted, stating now: „...N ₂ O load in the combustion gas can be reduced from a range of 1000 to 1300 ppmv to less than 200 ppmv,...“		
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The revision presents a range of 80% to 84.62% emission reductions instead of 85%. Further clarification is necessary.		
Corrective Action #2 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The indicated reduction efficiency range is based on practical experience and is generally conservative. For applying a conservative emission reduction projection to the Caojing project the reduction values have been corrected according to 80% (lower end) reduction efficiency.		
DOE Assessment #2 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The concentration values are now consistent with the (conservative) reduction efficiency. Thus CL 3.1.7-1 has been successfully closed.		



Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements
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Finding:	3.1.7-2		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	During site visit different information regarding the monitoring reporting frequency was given.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	PD section 7 has been amended, stating now: "An annual or semi-annual monitoring and reporting is envisaged."		
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The PD has been revised accordingly and a semi-annual or annual monitoring reporting frequency has been confirmed by the validation team during onsite visit. Thus CL 3.1.7-2 has been successfully closed.		
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements		

Finding:	3.1.7-3		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Information regarding the version and date of the VCS PD is missing.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	Date and version number has been amended (front page of PD); it is now indicated: "Date of VCS PD: 4 September June 2009, PD Version 2". Furthermore it is stated: "Replaces PD Version 1 from 4 June 2009". Furthermore a version change protocol has been amended.		
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The version change protocol is not required by the PD template, nevertheless it can be included as annex instead of on the front page.		



Corrective Action #2 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	According to your suggestion the version change protocol has moved to annex 1.
DOE Assessment #2 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The corresponding information has been included.
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Finding:	3.1.7-4		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Though commercially sensitive information is considered, section 1.17 of the VCS-PD has not been filled.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	A list of confidential documents has been amended to section 1.17 of PD.		
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The confidential documents served as evidences listed in section 1.17 have been observed during onsite visit and have been cross-checked. Thus CAR 3.1.7-1 has been successfully closed.		
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements		

Finding:	3.1.7-5		
Classification	☐ CAR	☐ CL	☒ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Confidential data for baseline and historic campaigns should be made available again for verification.		



Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The project participant will keep a dossier containing all relevant data available for verification.
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	
Conclusion <i>Tick the appropriate checkbox</i>	☒ To be checked during the first periodic verification ☐ Appropriate action was taken ☐ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements

Final Assessment

☒ The PD is in line with the applicable guidelines to fill the VCS-PD template.

3.2 Baseline

3.2.1 Approval of the baseline methodology

Description

The approved baseline methodology AM0034 "Catalytic reduction of N₂O inside the ammonia burner of nitric acid plants" (Version 3.2; EB 41)^{AM0034/} has been applied.

Related Findings

- ☒ No CARs, CLs or FARs have been identified in this context
- ☐ The following finding(s) have been addressed:

Final Assessment

AM0034 version 3.2 is an approved CDM methodology which is still valid. No

revisions thereof have been applied. Thus this methodology is applicable for project activities under the VCS.

☒ The applied baseline methodology is duly approved.

3.2.2 Correct application and justification of selected baseline methodology

Description

The justification of the choice of the applied methodology is given in section 2.2 of the VCS-PD. Except one criterion all applicable criteria are met. For discussion of the deviation pl. refer to the discussion below.

Related Findings

☒ No CARs, CLs or FARs have been identified in this context

☐ The following finding(s) have been addressed:

Final Assessment

The applicability criteria and the assessment thereof are summarized in table 3-2 below.

Table 3-2: Assessment of applicability criteria

Criteria		Fulfilled?
Limitation to existing production capacity	- The project activity does not lead to capacity additions (measured in t HNO₃/a). - This was evidenced during the site visit.	☒
Start of commercial production no later than 2005-12-31	- The commercial production of the SBPC plant started on 2006-07-15. Thus this applicability criterion is not met. This is a clear deviation, for which the VCS provisions of para 5.3 of the VCS 2007.1 are to be applied.	☐

	This is addressed in the following chapter 3.2.3. For various reasons it could be confirmed that the conservativeness of the ER generation is not affected by this late starting date and thus the validation team arrived at the conclusion that this deviation shall be approved.	
Shut down of existing N ₂ O destruction or abatement facilities	- During site visit it was evidenced that no N ₂ O destruction or abatement facilities were existent at the SBPC plant.	☒
Influence on nitric acid production	- During the site visit preliminary results were provided. From these values it was evidenced that the project activity has no significant influence on the nitric acid production.	☒
Regulatory requirements or incentives to reduce N ₂ O emissions	- By means of review of current Chinese legislation it was evidenced that currently there are no regulatory requirements or incentives in place in the host country.	☒
Influence on NO _x emissions	- During the site visit it was evidenced, on the basis of existing results, that there is no increase of NO _x emissions due to the project activity.	☒
NSCR DeNO _x	- There was no Non-Selective Catalytic Reduction DeNO _x unit installed prior to the start of the project activity. - This was evidenced during the site visit.	☒
Direct or indirect process emissions of GHG	- Due to the technology installed it is obvious that the project activity does not lead to direct or indirect GHG process emissions.	☒
Continuous real-time measurements of N ₂ O concentration and total gas volume flow rate	- During the site visit it was observed that continuous real-time measurements for the N ₂ O concentration and the volume flow rate have already been installed in	☒



	the stack.	
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All applicable applicability criteria have been duly addressed in the VCS-PD. The validation team arrived at the conclusion that all applicability criteria are met, considering the above mentioned deviation.

- ☒ The project activity is in line with the applicability criteria of the applied baseline methodology.

3.2.3 Application of methodology deviations or revisions

Description

The following deviation from the applied methodology has been applied in the VCS-PD:

- The commercial production of the nitric acid plant starting date is later than the last possible date (2005-12-31) stipulated in AM0034.

In line with para 5.3 of the VCS standard deviations can be permitted where they do not affect the conservativeness of (i) the baseline scenario (ii) the additionality determination and (iii) the included GHG sources, sinks and reservoirs.

The validation team has arrived at the conclusion that the above mentioned deviation fulfils the above criteria and thus the deviation is considered to be acceptable. The reasoning for this is described as follows.

- **History of the project:** SBPC has its initial design of IIP started in 1999. This has been described in the prefeasibility study report ^{/FSR/} and environmental impact assessment outline ^{/EIA/} in 2000. It completed the feasibility study reports in 2001 ^{/FSR/} and Environmental Impact Assessment Report in April 2001, with the nitric acid production design of 245,000 t/y, serving the MDI and TDI production in the IIP project. All FSR and EIA are approved by relevant government ^{/EIA/ /FSRA/}. In 2003, SBPC has adjusted the design capacity of MDI and TDI production, correspondingly increased the capacity of nitric acid production from 245,000t/y to 265,000 t/y ^{/FSR/ /EIA/} and have been approved by the government ^{/FSRA/ /EIA/}. From all the evidences provided by the PP, it can be seen that the nitric acid production was planned long time before end of 2005.
- **Plant integration:** The Nitric acid plant was designed for the SBPC MDI and TDI production as part of the IIP project. The abovementioned capacity expansion is also due to the MDI and TDI production design expansion in 2003. Thus it can be concluded that the plant installation and operation follows the requirements of the downstream production sites and not with regard to creating



emission reductions.

- **Eligibility for the CDM:** AM0028, in which the deadline of 2005-12-31 was introduced, was approved under CDM in Feb. 2006. The date has been included in this Meth, in order to assure that nobody could adjust production capacities just in order to benefit from CDM credits. The same logic has been adopted by AM0034. In the Caojing case it was already evident at this time that this project is not eligible for applying CDM a letter of approval from the Chinese DNA due to the non-full Chinese capital /dominant Chinese capital invested enterprise status of the project owner SBPC, which is a joint venture with 70% share of BASF Germany. According to China DNA regulation^{/DNAR/}, only full Chinese capital invested enterprise or joint venture with dominant Chinese investment are eligible for applying a letter of approval for CDM project in China. Thus even after the deadline there was no reasonable option for the plant to consider carbon credits.
- **Consideration of VCS:** Only after November 19th 2007 when the VCS standard was established and the nitric acid plant had operated for almost one and a half years, there was a serious opportunity to consider N₂O reduction as an eligible option for claiming carbon credits. Thus the implementation of the standard can not be considered as an incentive to adjust production capacities.

Thus it is concluded that SBPC had no reason to build up the nitric acid plant to 'game' for the emission reduction credits either under CDM (due to the reason of non-eligibility) or VCS (due to the reason of earlier commercial operation before the VCS came into effect).

For the abovementioned justification with substantiated evidences provided by the PP and background investigation by the DOE, the deviation from the methodology AM0028 version 4.2 can be permitted since they neither result in changes to the conservativeness of baseline scenario, additionality determination, and the included project GHG sources, sinks and reservoirs, nor impact negatively on the conservativeness of the VCS Program approved methodology's criteria and procedures to quantify data leading to GHG emission reductions or removals (VCS 2007.1 clause 5.3).

Related Findings

- ☐ No CARs, CLs or FARs have been identified in this context
- ☒ The following finding(s) have been addressed:

Finding:	3.2.3-1		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The justification of the considered starting date related deviation from AM0034 needs further justification with regard to conservativeness.		



Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	PD section 1.12 has been amended, including now also the following statements: ▪ „Applied methodology AM0034 was only adopted in July 2006 while methodology AM0028 (used for baseline definition) is from Oct. 2004.“ ▪ „With respect to the VCS as source of finance it shall be highlighted that plant operation began in mid 2006 and thus much earlier than the establishment of the VCS Standard at the end of 2007.“ Furthermore the argumentation with respect to plant integration refers now also to the plant capacity.
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The justification is assessed to be sufficient. Thus the CAR 3.2.3-1 is closed.
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Final Assessment

To be provided as part of the final validation reporting.

☒ No or only acceptable deviations have been applied.

3.2.4 Appropriate setting of baseline scenario

Description

The identification of the baseline scenario has been carried out in line with the corresponding section of AM0028 (version 4.2; EB41)^{/AM0028/}. As only feasible baseline scenario the continuation of the status quo was identified.

Related Findings

☐ No CARs, CLs or FARs have been identified in this context

☒ The following finding(s) have been addressed:

Finding:	3.2.4-1		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	In section 3.3, the specification values for AFR _{max} , AAR _{max} , OT _{normal} and OP _{normal} shall be mentioned in the VCS-PD.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The specific values have been amended in section 3.3.		
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The following values have been included in section 3.3 and confirmed during the on-site visit: AFR _{max} of 11.250 t/h (110% load) AAR _{max} of 11.35% OT _{normal} of 857,836 – 875,602 °C OP _{normal} of 0.28 – 0.45 MPa		
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements		

Finding:	3.2.4-2		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	In section 3.3, the evaluation of AFR _{max} , AAR _{max} , OT _{normal} and OP _{normal} shall be based on option alternatives a) of B.1 of AM0034.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The following paragraph has been amended (PD section 3.3): „For determination of AFR _{max} , AAR _{max} , OT _{normal} AM0034 option a (historical values) has been applied. As for OP _{normal} such historical values were not available, option b (direct reference to manual data) has been applied here.“		
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	During onsite visit and document check, the historical data for AFR _{max} , AAR _{max} , OT _{normal} have been observed and confirmed as accurate and conservative by the validation team. The justification for the selection of OP _{normal} is deemed appropriate. CAR 3.2.4-2 has been successfully closed.		
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements		



Finding:	3.2.4-3		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The baseline justification needs further elaboration with regard to the reasons for exclusion within step 3 (section 2.3).		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	For stringency step 3 of PD section 2.4 (prohibitive barrier analysis) has been amended. As a consequence of this, subsequent step 4 has been adjusted also. Now: Financially unattractive scenarios c, d/j, e, h are excluded not in step 3 but in step 4 (simple cost analysis).		
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	Footnote 7 is not accessible.		
Corrective Action #2 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	Not accessible web-based reference/link has been updated.		
DOE Assessment #2 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	OK		
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements		

Finding:	3.2.4-4		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	No value for the CL _{normal} is given. Furthermore the explanation of the same on page 29 (section 4.2) needs revision.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The value for CL _{normal} in section 3.3 has been amended. Furthermore the procedure for determination of the campaign length has been further explained in section 4.2.		



DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The reason for excluding the first campaign from the historical data to determine the normal campaign length should be explained in the PD.
Corrective Action #2 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The issue of inappropriate installation of gauzes during the first campaign (= reason for excluding this first campaign from determination of normal campaign length) is now addressed also in the respective table of section 3.3.
DOE Assessment #2 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The validation team is convinced that the calculation of CL _{normal} was carried out in line with the requirements of AM0034. The justification given is assessed to be appropriate.
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Final Assessment

To be provided as part of the final validation reporting.

☐ The baseline identification is in line with the applicable VCS criteria.

3.2.5 Assessment and demonstration of additionality

Description

The additionality of the project activity has been demonstrated on the basis of the latest version (5.2) of the "Tool for demonstration and assessment of additionality" /AT/.

Related Findings

- ☐ No CARs, CLs or FARs have been identified in this context
- ☒ The following finding(s) have been addressed:



Finding:	3.2.5-1		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The consideration of carbon credits during the management decision stage should be reflected in the VCS-PD.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	PD section 1.12 has been amended, now including also the board decision in the timeline presentation: "The management board decision to go for an application of mitigation technology and a VCS project was made in February 2008."		
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The evidence has been observed during onsite visit and the revision in the PD is confirmed appropriate. Thus CAR 3.2.5-1 has been successfully closed.		
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements		

Final Assessment

☒ The project is additional.

3.3 Monitoring Plan

3.3.1 Approval of the monitoring methodology

Description

As AM0034 is a combined baseline and monitoring methodology, pl. refer to chapter 3.2.1 for details.

Related Findings

- ☒ No CARs, CLs or FARs have been identified in this context
- ☐ The following finding(s) have been addressed:

Final Assessment

Pl. refer to chapter 3.2.1.

☒ The applied monitoring methodology is duly approved.

3.3.2 Correct application and justification of selected monitoring methodology

Description

As AM0034 is a combined baseline and monitoring methodology, with common applicability criteria, pl. refer to chapter 3.2.2 for details.

Related Findings

☐ No CARs, CLs or FARs have been identified in this context

☒ The following finding(s) have been addressed:

Finding:	3.3.2-1		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The condition for downtimes of the AMS shall be included in the VCS-PD.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	PD section 4.3 has been amended, including now a paragraph on the downtime of the automated measuring system as per AM0034.		
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The revision on downtimes of the AMS has been added to the PD and is confirmed as according to AM0034 version 3.2. Thus CAR 3.3.2-1 has been successfully closed.		



Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements
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Finding:	3.3.2-2		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	As per AM0034 the performance characteristics of the monitoring system shall be included in the PD.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The specific performance characteristics of the monitoring system have been amended. PD section 3.2 now contains an additional table on this topic.		
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	Additional information of the performance characteristics of the monitoring system has been included in chapter 3.2. The validation team is convinced that the requirements of AM0034 are met.		
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements		

Finding:	3.3.2-3		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The intended application of the requirements of EN 14181 shall be described in detail in the VCS-PD.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The parameter tables of section 3.3 now describe in detail where EN 14181 requirements are applied. Furthermore the PD has been amended, now containing an extended description of EN14181 application in section 3.4: "An automated measuring system (AMS) will be installed using European norm EN 14181 as guidance for its selection, installation, and operation. Thus three different levels of quality assurance tests and one annual functional test for the AMS shall be applied; The AMS together with the procedures for its uncertainty determination fulfil DIN EN ISO 14956 requirements."		



DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The intended application of EN 14181 requirements has been sufficiently clarified.
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Final Assessment



The project activity is in line with all applicability criteria of the applied monitoring methodology.

3.3.3 Collection and archiving of relevant monitoring data

Description

The data to be monitored is summarized in section 3.3 of the VCS-PD. The description of the monitoring plan is further detailed in section 3.4. The monitoring plan takes into account baseline emissions and project emissions, considering the quality control and quality assurance for data monitoring. The nitric acid plant has installed a continuous gas analyzer and a flow meter in the stack. The European norm EN14181:2004, which is referred to in AM0034 for the selection and operation of the AMS, has been and will be used throughout the crediting period (without exceptions). All levels of quality assurance comprising the following:

- QAL 1: Suitability of the AMS for the specific measuring task
- QAL 2: Validation of AMS following its installation
- QAL 3: Ongoing quality assurance during operation

The QAL 2 test, including measurements with a standard reference method, has to be carried out by a laboratory which has an accredited quality assurance system according to EN ISO/IEC 17025^{/QAL2/}. Data collected previous to the reception of the QAL 2 test results will be corrected through proper application of the calibration function.

Related Findings



- ☒ No CARs, CLs or FARs have been identified in this context
- ☐ The following finding(s) have been addressed:

Final Assessment

The description of the monitoring parameters is in line with the requirements of the VCS project description template^{VCS-PD-T/}. For each parameter all relevant information as given in the template table has been filled completely. All information given is assessed to be suitable to enable an unambiguous interpretation of the requirements during the verification. Furthermore parameters which have been omitted in the monitoring methodology but have to be monitored were added in section 3.3.

Further details of the monitoring plan are given in section 3.4. All continuous signals acquired as per the monitoring plan are logged electronically by the DCS. The frequency of data acquisition is 2 s. The data is stored within the system, aggregated to hourly mean values and exported to other data storage systems. The data will be kept throughout the crediting period plus at least 2 years.

Furthermore all applicable formulae for ex post calculation are given in this section. This altogether forms a solid basis for a thorough monitoring process in line with the applied methodology.

- ☒ The monitoring plan is in line with the VCS requirements.

3.3.4 Responsibility and authority for monitoring

Description

The PP's roles and responsibilities are described in sections 1.15 and 3.3 of the VCS-PD.

Related Findings

- ☒ No CARs, CLs or FARs have been identified in this context
- ☐ The following finding(s) have been addressed:

Final Assessment

The responsibilities for the project monitoring are duly described in the VCS-PD. During the site visit this topic was discussed in detail. Taking into consideration that most of the monitoring parameters are already measured as part of regular plant operations and that SBPC provides an experienced and qualified team of experts for the monitoring equipment, the validation arrived at the above conclusion.

- ☒ The responsibilities and authorities for monitoring are defined in line with the requirements of the VCS.

3.4 Calculation of GHG emissions

3.4.1 Appropriateness of the source, sink and reservoir

Description

ER are claimed exclusively for the abatement of N₂O emissions which is an unavoidable by-product of the nitric acid production process. With a global warming potential of 310 until 31st December 2012 and 298 from 1st January 2013 N₂O is an eligible Kyoto gas for which emission reduction credits can be claimed.

Related Findings

- ☒ No CARs, CLs or FARs have been identified in this context
- ☐ The following finding(s) have been addressed:

Final Assessment

In line with AM0034 no emission sources or leakages other than those addressed in the VCS-PD need to be considered.

- ☒ Regarding the appropriateness of the source, sink and reservoir the project activity is in line with the applicable VCS criteria.

3.4.2 Correctness and transparency of formulae and factors used

Description

The basic set of formulae to be applied in the context of this project activity is comparatively simple. All formulae are given in section 3.4 of the VCS-PD. Nevertheless the calculation parameters as per AM0034 have to undergo several statistical adjustments and are restricted to certain boundary conditions. All these additional data treatment procedures are also described in detail in section 3.4. All factors applied (e.g. GWP) are adopted from the applied methodology and other applicable guidelines (VCSA, UNFCCC, IPCC).

Related Findings

- ☐ No CARs, CLs or FARs have been identified in this context
- ☒ The following finding(s) have been addressed:

Finding:	3.4.2-1		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The choice of the ex-ante emission factor should be justified in the VCS-PD.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The following additional paragraph has been included in PD section 3.4: "The ex-ante emission factor of PD section 1.3 (7.5 kgN ₂ O/tHNO ₃) is based on first measured data shortly before and during the first days of the baseline campaign. The uncertainty of the AMS (to be discounted) is not considered in the figure as it is not known yet. Still first emission factor data from the analyser during baseline determination generally support the conservativeness of the assumption."		
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The justification given is assessed to be sufficient. The value chosen is appropriate for ex-ante calculation.		
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements		

Finding:	3.4.2-2		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The application of the N ₂ O GWP of 310 is limited until 2012.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The PD has been updated accordingly. A corresponding monitoring parameter has been included.		
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The PD revisions are appropriate.		
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements		

Final Assessment

- ☒ The formulae and factors applied are correct and transparent and thus in line with the VCS criteria.

3.4.3 Assumptions made for GHG emission reduction estimations

Description

The parameters used for ex-ante calculation are partly based on measured and estimated data. The baseline emission factor is based on the results achieved from the baseline campaign and shortly before the start of the baseline campaign, whereas the project emission factor for the project campaigns is calculated on the basis of 80 % efficiency of the N₂O reduction. The value considered as average nitric acid production have been taken from simultaneous measurements.

Related Findings

- ☒ No CARs, CLs or FARs have been identified in this context
- ☐ The following finding(s) have been addressed:

Final Assessment

The assumptions made for the purpose of the ex-ante calculation can be assessed as reasonable and backed up by appropriate experience. Furthermore results from the baseline campaign could be used. The calculated emission reductions of 4,929,000 tCO_{2eq} is most likely to be achieved throughout the crediting period.

- ☒ The project technology and the description of the same are in line with the applicable VCS criteria.

3.4.4 Uncertainties

Description

Unlike most of the other CDM methodologies AM0034 addresses uncertainties as part of the project monitoring as a monitoring parameter and for ex-ante calculation. Uncertainties are to be discounted from the baseline emissions. On the basis of the QAL 2 report the uncertainty will be determined at a later stage of the baseline campaign. The uncertainty determination shall be carried out in line with Annex 1 of AM0034. The parameter itself has to be assessed as part of the verification.

Related Findings

- ☒ No CARs, CLs or FARs have been identified in this context
- ☐ The following finding(s) have been addressed:

Final Assessment

The uncertainty assessment will be carried out as part of the QAL 2 report for the baseline campaign. Corresponding uncertainties are to be assumed for the project emissions. The calculation includes several procedures to ensure that all assumptions made for calculation are conservative so that the danger of overestimation of ER can be considered as negligible.

- ☒ The consideration of uncertainties is in line with the applicable VCS criteria.

3.5 Environmental impact

Description

The requirements for an Environmental Impact Assessment (EIA) are ruled by the National Chinese Legislation 'Construction Project Environmental Impact Assessment Requirements' ^{/EIA/}. As per this act no EIA is required for this kind of project activities under the given conditions.

Related Findings

- ☒ No CARs, CLs or FARs have been identified in this context
- ☐ The following finding(s) have been addressed:

Final Assessment

As per the Chinese legislation no EIA is required. The corresponding legislation was checked. Furthermore the validation team is convinced that no adverse environmental impacts are to be considered for this kind of project activity.

- ☒ The project activity is in line with the environmental impact assessment criteria of the VCS.

3.6 Comments by stakeholders

Description

The VCS-PD was published on the validator's website www.global-warming.de from 2009-07-08 to 2009-08-07 to invite stakeholders to comment on this VCS project activity. No comments have been received (so far).

A local stakeholder meeting was not carried out prior to the validation of the project. This is due to the obvious difficulty to identify local stakeholders in the vicinity of the Shanghai Chemical Industry Park which might be affected by this project.

Considering the kind of project and the absence of negative effects to the environment and the local stakeholders the validator considers this to be in line with the VCS requirements.

Related Findings

- ☒ No CARs, CLs or FARs have been identified in this context
- ☐ The following finding(s) have been addressed:

Final Assessment

A global stakeholder consulting process was carried out. No comments have been received. A local stakeholder consultation meeting was not held as no affected local stakeholders could be identified.

- ☒ The stakeholder consultation process is in line with the VCS requirements.



4 VALIDATION CONCLUSION

Shanghai BASF Polyurethane Co., Ltd. via BASF SE has commissioned the TÜV NORD JI / CDM Certification Program to carry out the validation of the Project "Catalytic Reduction of N₂O inside the Ammonia Burners of the Nitric Acid Plant in Caojing, Shanghai" in Shanghai, China with regard to the requirements of VCS 2007.1 Standard.

The project activity involves the installation of a secondary N₂O reduction catalyst in the ammonia oxidizer of the nitric acid plant of Shanghai BASF Polyurethane Co., Ltd.

In the course of the draft validation 10 Corrective Action Requests (CARs), 6 Clarification Requests (CLs) were successfully closed and 2 Forward Action Requests (FAR) need to be verified during the first periodic verification.

The review of the project design documentation and additional documents related to baseline and monitoring methodology and subsequent background investigation have provided the TÜV NORD JI/CDM CP with sufficient evidence to validate the fulfilment of the stated criteria.

In detail the conclusions can be summarised as follows:

- The project is in line with all relevant host country legislation.
- The project additionality is sufficiently justified in the VCS-PD.
- The monitoring plan is transparent and adequate.
- Deviations from the applied CDM methodology have sufficiently been addressed and justified.
- The calculation of the project emission reductions is carried out in a transparent and conservative manner, so that the calculated emission reductions of 4,929,000 t CO₂e is most likely to be achieved within the 10 year renewable crediting period.

The conclusions of this report show, that the project, as it was described in the project documentation, is in line with all criteria applicable for the validation against the VCS 2007.1 standard.

Essen, 2010-07-20

A handwritten signature in blue ink, appearing to read "Winter".

Rainer Winter
TÜV NORD JI/CDM CP
Validation Team Leader

Essen, 2010-07-20

A handwritten signature in blue ink, appearing to read "Saalmann".

Martin Saalmann
TÜV NORD JI/CDM CP
Final Approval

5 REFERENCES

Table 5-1: Documents provided by the project participant

Reference	Document
/BL/	Business License of SBPC (operation period: 2003-03-07 to 2053-03-06), issued by Shanghai City Industry and Commercial Administration Bureau (renewed on 2009-04-22), operation scope includes, among others, production of MDI, TDI and nitric acid.
/CAFI/	Certificate of Approval for Establishment of Enterprises with Foreign Investment in the People's Republic of China issued by Ministry of Commerce of the People's Republic of China for Shanghai BASF Polyurethane Company Limited (date of approval: 2003-01-29) (evidence of foreign investment share more than 51% of the registered capital of the SBPC, which identifies the SBPC as a non-resident enterprise in China)
/CIA/	Customer Invoice of gas analyzer from BASF SE Germany to SBPC (2008-11-14) (evidence for project ownership and monitoring plan)
/COSI/	Catalyst (type O3-85 SS6 6mm extrudate) Order Sheet for the project by Shanghai BASF Polyurethane Co., Ltd. (2007-11-28) (evidence for project ownership)
/CQCI/	Catalyst Quality Certificates (for Campaign 2008-03-12 to 2009-03-10)
/CSRI/	Construction Start Report of IIP project including nitric acid production (2004-04-02) signed by Daelin Industrial Co., Ltd., Shanghai Sankai Construction Supervisory Co., Ltd., and Shanghai Pugao construction Engineering co., Ltd.
/DNI/	Delivery Notes of the catalyst supplier for the previous campaigns (confidential)
/DNARI/	China DNA's regulation on Clean Development Mechanism Operation Management issued by China National Development and Reform Committee, Ministry of Science and Technology, Ministry of Foreign Affairs and Ministry of Finance on 2005-10-12 (Clause 11, 17 and 18 indicates only resident enterprise with full Chinese capital or dominating capital investment, i.e., more than 51% shares, are eligible for developing CDM projects, which disqualifies the SBPC's eligibility for applying CDM)
/DSI/	N ₂ O catalyst design sheet from BASF (for 85% abatement factor, confidential)

Reference	Document
/EIA/	1. Environmental Impact Assessment Outline on Sino-Foreign Joint Venture Integrated Isocyanates project, Shanghai (06/2000), designed by China Tianchen Chemical Engineering Corp., qualification level A (with design institute certificate, evidence for the HNO₃ production capacity pre-design of 245,000 t/y) 2. Environmental Impact Assessment Report on Sino-Foreign Joint Venture Integrated Isocyanates project (04/2001), designed by China Tianchen Chemical Engineering Corp., qualification level A (with design institute certificate, evidence for the HNO₃ production capacity pre-design of 245,000 t/y) 3. Sino-Foreign Joint Venture Shanghai Integrated Isocyanates Project Environmental Impact Report Supplement (11/2004), designed by China Tianchen Chemical Engineering Corp., qualification level A (with design institute certificate evidence for the HNO₃ production capacity design expanded to 265,000 t/y)
/EIAA/	1. Environmental Impact Assessment Approval issued by National Environmental Protection Bureau (2001-07-16) 2. Environmental Impact Assessment Supplement Evaluation Meeting organized by National Environmental Protection Bureau (2004-09-29)
/EIAR/	Construction Project Environmental Impact Assessment Requirements issued by the National Environmental Protection Bureau (2004-12-02)
/FMD/	Flow Measuring Device FMD 99 Operation Manual for tail gas from Dr. Foedisch Umweltmesstechnik AG
/FSR/	1. Pre-Feasibility Study Report on TMI project of SBPC (08/1999) by China Huanqiu Chemical Engineering Corp. and Shanghai Chemical Industry Design Institute (evidence for the HNO₃ production capacity pre-design of 245,000 t/y) 2. Prefeasibility Study Report of Sino-Foreign Joint Venture 160KT/A Crude MDI project (MDI) (08/1999), prepared by China International Chemical Consulting Corp. and China Tianchen Chemical Engineering Corp. (evidence for the HNO₃ production capacity pre-design of 245,000 t/y and the purpose of nitric acid production is to supply to crude MDI and TDI production) 3. Prefeasibility Study Summary Report of Sino-Foreign Joint Venture Shanghai Integrated Isocyanates project (08/1999), prepared by China International Chemical Consulting Corporation (evidence for the HNO₃ production capacity pre-design of 245,000 t/y) 4. Feasibility Study Summary Report of Sino-Foreign Joint Venture Shanghai Integrated Isocyanates projects (11/2001) by China International Chemical Consulting Corporation (evidence for the HNO₃ production capacity pre-design of 245,000 t/y) 5. Feasibility Study Report of Sino-Foreign Joint Venture 160KT/A Crude MDI project (11/2001) by China International Chemical

Reference	Document
	Consulting Corp. and China Tianchen Chemical Engineering Corp. (evidence for the HNO₃ production capacity pre-design of 245,000 t/y and the purpose of nitric acid production is to supply to crude MDI and TDI production) 6. Shanghai BASF Polyurethane Company Limited Feasibility Study Report on TDI and MDI Project (11/2001), by China Huanqiu Chemical Engineering Corporation (evidence for the HNO₃ production capacity pre-design of 245,000 t/y and the purpose of nitric acid production is to supply to crude MDI and TDI production) 7. Sino-Foreign Joint Venture Integrated Isocyanates Projects project design production capacity adjustment report (10/2003, evidence for the HNO₃ production capacity design expanded to 265,000 t/y)
/FSRA/	1. Feasibility Study Summary Report of Sino-Foreign Joint Venture Shanghai Integrated Isocyanates Projects approval (2003-08-12) by Shanghai Chemical Industry Area Management Committee (with HNO₃ production capacity design of 245,000 t/y) 2. Approval on Sino-Foreign Joint Venture IIP project design production capacity adjustment report (2003-10-30) by Shanghai Chemical Industry Area Management Committee (with HNO₃ production capacity design expanded to 265,000 t/y)
/HPDI/	Historic performance data (e.g. ammonia production, operating temperatures, operating pressure, ammonia flow rate, air flow rate)
/IMS/	1. Quality Management System (ISO 9001: 2000) Certificate of SBPC (2008-12-18) issued by Shanghai Audit Centre of Quality System 2. Environmental Management System (ISO 14001: 2004) Certificate of SBPC (2008-12-18) issued by Shanghai Audit Centre of Quality System 3. Occupation Health and Safety Management System (OHSAS 18001: 1999) Certificate of SBPC (2008-12-18) issued by Shanghai Audit Centre of Quality System (evidence for Quality Control and Quality Assurance of the SBPC)
/MCC/	HNO ₃ plant (area No. A615) mechanical completion letter and certificate (2006-03-17) signed by Team IIP Construction Representative, Team IIP Directive Representative and Owner Representative Acceptance (evidence for completion of the nitric acid production plant)
/OM/	Operating Manual, process description and operation control (evidence for cross check technical parameters, e.g., concentration 68%, etc. confidential)
/OM/	Operating manual N ₂ O Analyzer

Reference	Document
/PAI/	Project Application of New HNO ₃ Plant 245kt/yr (ISBL) for SBPC, Caojing (evidence for project design in 2001)
/PCM/	Preliminary result from Concentration Measurements prior to the baseline campaign (02/2009)
/PII/	P&I diagrams of the plant
/PLI/	Production Logs of nitric acid production campaigns, for the gauzes changes
/PSAP/	Planungsstunden in SAP system (evidence for project planning since 1998, confidential)
/UTB/	Unterlagen fuer die Technische Beurteilung (evidence for internal management decision, confidential)
/XCSI/	Emission reduction excel calculation sheets

Table 5-2: Background investigation and assessment documents

Reference	Document
/AM0028/	Catalytic N ₂ O destruction in the tail gas of Nitric Acid or Caprolactam Production Plants" (version 4.2; EB 41)
/AM0034/	Catalytic reduction of N ₂ O inside the ammonia burner of nitric acid plants (version 3.2; EB 41)
/CPM/	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)
/EN14181/	EN DIN 14181
/IPCC/	2006 IPCC Guidelines
/ISO 14064/	Greenhouse gases -- Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals Greenhouse gases -- Part 2: Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements

Reference	Document
	Greenhouse gases -- Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions
/ISO14065/	Greenhouse gases -- Requirements for greenhouse gas validation and verification bodies for use in accreditation or other forms of recognition
/AT/	Tool for the demonstration and assessment of additionality (Version 05.2; EB 39).
/VCS/	Voluntary Carbon Standard 2007.1
/VDS-PD-T/	VCS PD Template
/VVM/	Validation and Verification Manual (version 1; EB 44)

Table 5-3: Websites used

Reference	Link	Organisation
/cd4cdm/	www.cd4cdm.org	UNEP Riso Centre
/ndrc/	http://assets.panda.org/downloads/chinas_national_climate_change_programme_en.pdf	China's National Climate Change Programme. National Development and Reform Commission (NDRC) of People's Republic of China, available for download at
/ipcc/	http://eippcb.jrc.es/pages/FActivities.htm	Integrated Pollution Prevention and Control (IPPC) Reference Document on Best Available Techniques for the Manufacture of Large Volume Inorganic Chemicals-Ammonia, Acids and Fertilizers. Directorate-General Joint Research Centre (JRC), Institute for Prospective Technological Studies, European Commission, Seville, Spain; December 2006
/ecn/	http://www.ecn.nl/docs/library/report/2005/rx05080.pdf	Decomposition of N ₂ O in the nitric acid industry, Report number ECN-RX-05-080. Energy Research Centre of The Netherlands, Petten, The Netherlands
/vcs/	www.v-c-s.org	VCS
/unfccc/	http://cdm.unfccc.int	UNFCCC



Table 5-4: List of interviewed persons

Reference	Mol ₁	Date		Name	Organisation / Function
//IM01/	V	2009-07-08 to 2009-07-09	☐ Mr. ☒ Ms.	Karolina Zhang	Process Engineer of Nitric Acid Plant, SBPC
//IM01/	V	2009-07-08 to 2009-07-09	☒ Mr. ☐ Ms.	Jeff Dai	Deputy GM, Maintenance, Engineering & EHS, SBPC
//IM01/	V	2009-07-08 to 2009-07-09	☒ Mr. ☐ Ms.	Li Qiang	Analyzer Engineer, SBPC
//IM01/	V	2009-07-08 to 2009-07-09	☒ Mr. ☐ Ms.	Leo Liu	Plant manager of Nitric Acid plant, SBPC
//IM01/	V	2009-07-08 to 2009-07-09	☒ Mr. ☐ Ms.	Daniel Scholz	Future Camp Climate GmbH, project developer, consultant
//IM01/	V	2009-07-08 to 2009-07-09	☒ Mr. ☐ Ms.	Markus Wiehe	BASF, GHG Management

¹⁾ Means of Interview: (Telephone, E-Mail, Visit)