VERIFICATION REPORT

- 4TH PERIODIC –

CARBON ASSET MANAGEMENT SWEDEN AB

ZHUMADIAN ZHONGYUAN GAS-STEAM COMBINED CYCLE POWER PROJECT IN HENAN CHINA

UNFCCC REF. NO.: 2344

Monitoring Period: 2010-12-01 to 2011-03-31
(incl. both days)

Report No: 8000394780 - 11/161

Date: 2011-08-24

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Verification Report:	***Report No.***	***Rev. No.***	***Date of 1st issue:***	***Date of this rev.***
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Project:	***Title:***		***Registration date:***	***UNFCCC-No.:***
	Zhumadian Zhongyuan Gas-Steam Combined Cycle Power Project in Henan China		2009-08-25	2344
Project Participant(s):	***Host party:***		***Other involved parties:***	
	Huaneng Henan Zhongyuan Gas Power Company Ltd. (P.R. China)		Carbon Asset Management Sweden AB (Sweden and Switzerland)	
Applied methodology/ies:	***Title:***		***No.:***	***Scope:***
	Baseline Methodology for Grid Connected Electricity Generation Plants using Natural Gas		AM0029 Ver. 03	1
Monitoring:	***Monitoring period (MP):***		***No. of days:***	***MP No.***
	2010-12-01 to 2011-03-31 - both days included		121	4
Monitoring report:	***Title:***		***Draft version:***	***Final version:***
	Zhumadian Zhongyuan Gas-Steam Combined Cycle Power Project in Henan China		1	5
Verification team / Technical Review and Final Approval	***Verification Team:***		***Technical review:***	***Final approval:***
	Huang Jie (TL)		Christina Stöhr, Stefan Winter	Martin Saalmann
Emission reductions: [t CO_{2e}]	***Verified amount***		***As per draft MR:***	***As per PDD:***
	54,881		54,881	858,165 t /a

Summary of Verification Opinion:

Carbon Asset Management Sweden AB has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 4th periodic verification of the project: "Zhumadian Zhongyuan Gas-Steam Combined Cycle Power Project in Henan China", with regard to the relevant requirements for CDM project activities. The project activity generates electricity utilizing available natural gas at the project site to avoid GHG emissions. This verification covers the period from 2010-12-01 to 2011-03-31 (including both days).

In the course of the verification 3 Corrective Action Requests (CAR) and 1 Clarification Requests (CL) were raised and successfully closed. Furthermore no FARs are raised to improve the monitoring system in the future. The verification is based on the draft monitoring report, revised monitoring report, the monitoring plan as set out in the registered PDD, the validation report, emission reduction calculation spreadsheet and supporting documents made available to the TÜV NORD JI/CDM CP by the project participant.

As a result of this verification, the verifier confirms that:

- all operations of the project are implemented and installed as planned and described in the validated project design document.
- the monitoring plan is in accordance with the applied approved CDM methodology ,i.e., AM0029 Ver.03
- the installed equipment essential for measuring parameters required for calculating emission reductions are calibrated appropriately.
- the monitoring system is in place and functional. The project has generated GHG emission reductions.

As the result of the 4th periodic verification, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. TÜV NORD JI/CDM CP herewith confirms that the project has achieved emission reductions in the above mentioned reporting period as follows:

Emission reductions: **54,881** t CO_{2e}

Document information:	*Filename:*	*No. of pages:*
	2011-08-23 FVR_Zhumadian NGCC 4th VER	72

Abbreviations:

CA	**Corrective Action / Clarification Action**
CAR	**Corrective Action Request**
CDM	**Clean Development Mechanism**
CER	**Certified Emission Reduction**
CO_2	**Carbon dioxide**
CO_{2eq}	**Carbon dioxide equivalent**
CL	**Clarification Request**
ER	**Emission Reduction**
FAR	**Forward Action Request**
GHG	**Greenhouse gas(es)**
MP	**Monitoring Plan**
MR	**Monitoring Report**
PA	**Project Activity**
PDD	**Project Design Document**
PP	**Project Participant**
QA/QC	**Quality Assurance / Quality Control**
UNFCCC	**United Nations Framework Convention on Climate Change**
XLS	**Emission Reduction Calculation Spread Sheet**
CCPG	**Central China Power Grid**
NDRC	**National Development and Reform Commission of People's Republic of China**

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1. INTRODUCTION

Carbon Asset Management Sweden AB has commissioned the TÜV NORD JI/CDM Certification Program (CP) to carry out the 4th periodic verification of the project

"Zhumadian Zhongyuan Gas-Steam Combined Cycle Power Project in Henan China"

with regard to the relevant requirements for CDM project activities. The verifiers have reviewed the implementation of the monitoring plan (MP) in the registered CDM project number 2344[1].

GHG data for the monitoring period covering 2010-12-01 to 2011-03-31 was verified in detailed manner applying the set of requirements, audit practices and principles as required under the Validation and Verification Manual /VVM/ of the UNFCCC.

This report summarizes the findings and conclusions of this 4th periodic verification of the above mentioned UNFCCC registered project activity.

1.1. Objective

The objective of the verification is the review and ex-post determination by an independent entity of the GHG emission reductions. It includes the verification of the:

- implementation and operation of the project activity as given in the PDD,
- compliance with applied approved methodology and the provisions of the monitoring plan,
- data given in the monitoring report by checking the monitoring records, the emissions reduction calculation and supporting evidence,
- accuracy of the monitoring equipment,
- quality of evidence,
- significance of reporting risks and risks of material misstatements.

1.2. Scope

The verification of this registered project is based on the validated project design document /PDD/, the monitoring report /MR/, emission reduction calculation spread sheet /XLS/, supporting documents made available to the verifier and information collected through performing interviews and during the on-site assessment. Furthermore publicly available information was considered as far as available and required.

The verification is carried out on the basis of the following requirements, applicable for this project activity:

[1] http://cdm.unfccc.int/Projects/DB/TUEV-SUED1229357612.62/view

- Article 12 of the Kyoto Protocol /KP/,
- guidelines for the implementation of Article 12 of the Kyoto Protocol as presented in the Marrakech Accords under decision 3/CMP.1 /MA/, and subsequent decisions made by the Executive Board and COP/MOP,
- other relevant rules, including the host country legislation,
- CDM Validation and Verification Manual /VVM/,
- monitoring plan as given in the registered PDD /PDD/,
- Approved CDM Methodology AM0029 ver. 03: Baseline Methodology for Grid Connected Electricity Generation Plants using Natural Gas.

2. GHG PROJECT DESCRIPTION

2.1. Project Characteristics

Essential data of the project is presented in the following Table 2-1.

Table 2-1: Project Characteristics

Item	Data		
Project title	Zhumadian Zhongyuan Gas-Steam Combined Cycle Power Project in Henan China		
Project size	☒ Large Scale ☐ Small Scale		
Project Scope *(according to UNFCCC sectoral scope numbers for CDM)*	☒	1	Energy Industries (renewable- /non-renewable sources)
	☐	2	Energy distribution
	☐	3	Energy demand
	☐	4	Manufacturing industries
	☐	5	Chemical industry
	☐	6	Construction
	☐	7	Transport
	☐	8	Mining/Mineral production
	☐	9	Metal production
	☐	10	Fugitive emissions from fuels (solid, oil and gas)
	☐	11	Fugitive emissions from production and consumption of halocarbons and hexafluoride
	☐	12	Solvents use
	☐	13	Waste handling and disposal
	☐	14	Afforestation and Reforestation
	☐	15	Agriculture
Applied Methodology	AM0029: 'Baseline methodology for grid connected electricity generation plants using natural gas' Ver. 03		
Technical Area(s)	1.1: Thermal energy generation		
CDM registration No.	2344		
Crediting period	☒ Renewable Crediting Period (7 y) ☐ Fixed Crediting Period (10 y)		

2.2. Project Verification History

Essential events since the registration of the project are presented in the following Table 2-2.

Table 2-2: Project verification history

#	Item	Time	Status
1	Date of registration	2009-08-25	-
2	Crediting period	2009-08-25 to 2016-08-24	-
3	1st Monitoring period	2009-08-25 to 2010-02-28	Issued
4	2nd Monitoring period	2010-03-01 to 2010-06-30	Issued
5	3rd Monitoring period	2010-07-01 to 2010-11-30	Issued
6	4th Monitoring period	2010-12-01 to 2011-03-31	Ongoing

2.3. Involved Parties and Project Participants

The following parties to the Kyoto Protocol and project participants are involved in this project activity (Table 2-3).

Table 2-3: Project Parties and project participants

Characteristic	Party	Project Participant
Host party	P.R. China	Huaneng Henan Zhongyuan Gas Power Company Ltd.
Other involved party/ies	Sweden	Carbon Asset Management Sweden AB
	Switzerland	

2.4. Project Location

The details of the project location are given in table 2-4:

Table 2-4: Project Location

No.	Project Location	
Host Country	People's Republic of China	
Region:	Henan Province	
Project location address:	Zhumadian City	
North-west corner:	Latitude: 32°57'31'' N	Longitude: 114°03'39'' E
South-west corner:	Latitude: 32°57'22'' N	Longitude: 114°03'39'' E
South-east corner:	Latitude: 32°57'22'' N	Longitude: 114°03'52'' E
North-east corner:	Latitude: 32°57'31'' N	Longitude: 114°03'52'' E

2.5. Technical Project Description

The project adopted Natural Gas fired Combined Cycle (NGCC) technology for power generation of which consists of two phase combined dynamic cycles: the first phase (Gas Cycle) takes place in the gas turbine where high temperature gas with about 1400℃ generated by natural gas combustion to rotate a coupled AC power generator for power generation. In the second phase (Steam Cycle), the exhausted gas discharged from gas turbine in a heat recovery boiler with temperature of about 600℃ and pressure of 10.67 MPa, afterwards the steam flow into the steam turbine to generate electricity in the AC power generator. This technology can make full use of the energy contained in the natural gas through the two cycle circulation. The installed capacity of the project is 2×377.2MW. The electricity generation is estimated of 2,640,400 MWh and net electricity of 2,584,423.5 MWh delivered to CCPG via Henan grid annually.

The main equipments i.e. two sets of NGCC are manufactured jointly by a consortium company and Shanghai and German Siemens respectively. The technology employed is environmentally safe and sound.

The electricity generated is delivered to CCPG through Henan grid after boosted from 21kV to 500kV via the main transformer in the project site. The natural gas consumed by the project comes from "West-to-East Natural Gas Transmission Pipeline" (via Southern Henan branch pipeline). No supply constrains were expected.

The project complies with all relevant statutory requirements.

The key parameters for the project are given in table 2-5:

Table 2-5: Technical data of one set of NGCC plant

Parameter	Unit	Value
Gas Turbine		
Model	-	V94.3A
Rated speed	rpm	3,000
Flow rate of flue gas	t/h	2396.5
Temperature of flue gas	℃	586.5
Rated output	MW	243.4
Manufacturer	-	Siemens Co., in Germany
Steam Turbine		
Model	-	TCF-1
Rated speed	rpm	3,000
Rated output	MW	133.8
Manufacturer	-	Shanghai Steam Turbine Co., Ltd.
Heat Recovery Boiler		
Feed-in water temperature	℃	55
Manufacturer	-	Wuhan Boiler Manufacture Co.
HRSG Generator		
Model	-	THDF 108/53
Rated voltage	kV	21
Rated current	A	13,142
Rated frequency	Hz	50
Rated speed	rpm	3,000
Manufacturer	-	Shanghai Elec. Group Co.
Total output of one set	MW	377.2

3. METHODOLOGY AND VERIFICATION SEQUENCE

3.1. Verification Steps

The verification consisted of the following steps:

- Contract review
- Appointment of team members and technical reviewers
- Publication of the monitoring report
- A desk review of the Monitoring Report /MR/ submitted by the client and additional supporting documents with the use of customised verification protocol /CPM/ according to the Validation and Verification Manual /VVM/,
- Verification planning,
- On-Site assessment,
- Background investigation and follow-up interviews with personnel of the project developer and its contractors,
- Draft verification reporting
- Resolution of corrective actions (if any)
- Final verification reporting
- Technical review
- Final approval of the verification.

The sequence of the verification is given in the table 3-1 below:

Table 3-1: Verification sequence

Topic	Time
Assignment of verification	2010-12-23
Uploading of Monitoring Report	2011-04-15
On-site visit	2011-06-20 ~ 21
Draft reporting finalised	2011-07-03
Final reporting finalised	2011-08-23
Technical review finalised	2011-08-24

3.2. Contract review

To assure that

- the project falls within the scopes for which accreditation is held,
- the necessary competences to carry out the verification can be provided,
- Impartiality issues are clear and in line with the CDM accreditation requirements

a contract review was carried out before the contract was signed.

3.3. Appointment of team members and technical reviewers

On the basis of a competence analysis and individual availabilities a verification team was appointed. The team was assisted by a Technical Expert. Furthermore also personnel for observation, the technical review and the final approval was determined.
The list of involved personnel, the tasks assigned and the qualification status are summarized in the table 3-2 below.

Table 3-2: Involved Personnel

	Name	Company	Function [1]	Qualification Status [2]	Scheme competence [3]	Technical competence [4]	Verification competence [5]	Host country Competence	On-site visit
☐ Mr. ☒ Ms.	Huang Jie	TÜV NORD China	TL	LA	☒	-	☒	☒	☒
☐ Mr. ☒ Ms.	YU, Miao	TÜV NORD China	OT[B]	T	☐	-	☒	☒	☒
☒ Mr. ☐ Ms.	Wu Jian Min	-	ETE[B]	TE	☐	1.1	☒	☒	☒
☐ Mr. ☒ Ms.	Stöhr, Christina	TÜV NORD Cert GmbH	TR[B]	A	☒		☐	☐	☐
☒ Mr. ☐ Ms.	Stefan Winter	TÜV NORD Cert GmbH	TR[B]	SA	☒	1.1	☒	☐	☐
☒ Mr. ☐ Ms.	Martin Saalmann	TÜV NORD Cert GmbH	FA[B]	SA	☒		☐	☐	☐

1) TL: Team Leader; TM: Team Member, TR: Technical review; OT: Observer-Team, OR: Observer-TR; FA: Final approval
2) GHG Auditor Status: A: Assessor; LA: Lead Assessor; SA: Senior Assessor; T: Trainee; TE: Technical Expert
3) GHG auditor status (at least Assessor)
4) As per S01-MU03 or S01-VA070-A2 (such as 1.1, 1.2, …)
5) In case of verification projects
A) Team Member: GHG auditor (at least Assessor), Technical Expert (incl. Host Country Expert or Verification Expert), not ETE
B) No team member

Statements of competence for the above mentioned team members are enclosed in annex 2 of this report.

3.4. Publication of the Monitoring Report

In accordance with the CDM M&P (§ 62) the draft monitoring report, as received from the project participants, has been made publicly available on the dedicated UNFCCC

CDM website prior to the verification activity commenced. Comments received are taken into account in the course of the verification, if applicable.

3.5. Verification Planning

In order to ensure a complete, transparent and timely execution of the verification task the team leader has planned the complete sequence of events necessary to arrive at a substantiated final verification opinion.

Various tools have been established in order to ensure an effective verification planning.

Risk analysis and detailed audit testing planning

For the identification of potential reporting risks and the necessary detailed audit testing procedures for residual risk areas table A-1 is used. The structure and content of this table is given in table 3-2 below.

Table 3-2: Table A-1; Identification of verification risk areas

Table A-1: GHG calculation procedures and management control testing / Detailed audit testing of residual risk areas and random testing				
Identification of potential reporting risk	**Identification, assessment and testing of management controls**	**Areas of residual risks**	**Additional verification testing performed**	**Conclusions and Areas Requiring Improvement (including *Forward Action Requests*)**
The following potential risks were identified and divided and structured according to the possible areas of occurance.	*The potential risks of raw data generation have been identified in the course of the monitoring system implementation.* *The following measures were taken in order to minimize the corresponding risks.* *The following measures are implemented:*	*Despite the measures implemented in order to reduce the occurrence probability the following residual risks remain and have to be addressed in the course of every verification.*	*The additional verification testing performed is described. Testing may include:* - *Sample cross checking of manual transfers of data* - *Recalculation* - *Spreadsheet 'walk throughs' to check links and equations* - *Inspection of calibration and maintenance records for key equipment* - *Check sampling analysis results* *Discussions with process engineers who have detailed knowledge of process uncertainty/error bands.*	*Having investigated the residual risks, the conclusions should be noted here. Errors and uncertainties are highlighted.*

The completed table A-1 is enclosed in the annex 1 (table A-1) to this report.

Project specific periodic verification checklist

In order to ensure transparency and consideration of all relevant assessment criteria, a project specific verification protocol has been developed. The protocol shows, in a transparent manner, criteria and requirements, means and results of the verification. The verification protocol serves the following purposes:

- It organises, details and clarifies the requirements a CDM project is expected to meet for verification
- It ensures a transparent verification process where the verifying DOE documents how a particular requirement has been proved and the result of the verification.

The basic structure of this project specific verification protocol for the periodic verification is described in table 3-3.

Table 3-3: Structure of the project specific periodic verification checklist

Table A-2: Periodic verification checklist				
Checklist Item	***Reference***	***Verification Team Comments***	***Draft Conclusion***	***Final Conclusion***
The checklist items in Table A-2 are linked to the various require-ments the monitoring of the project should meet. The checklist is organised in various sections as per the requirements of the topic and the individual project activity. It further includes guidance for the verification team.	*Gives reference to the information source on which the assessment is based on.*	*The section is used to elaborate and discuss the checklist item in detail. It includes the assessment of the verification team and how the assessment was carried out. The reporting requirements of the VVM shall be covered in this section.*	*Assessment based on evidence provided if the criterion is fulfilled (OK), or a CAR, CL or FAR (see below) is raised. The assessment refers to the draft verifi-cation stage.*	*In case of a corrective action or a clarification the final assessment at the final verification stage is given.*

The periodic verification checklist (verification protocol) is the backbone of the complete verification starting from the desk review until final assessment. Detailed assessments and findings are discussed within this checklist and not necessarily repeated in the main text of this report.

The completed verification protocol is enclosed in the annex (table A-2) to this report.

3.6. Desk review

During the desk review all documents initially provided by the client and publicly available documents relevant for the verification were reviewed. The main documents are listed below:

- the last revision of the PDD including the monitoring plan/PDD/,
- the last revision of the validation report/VAL/,
- documentation of previous verifications/VER/

- the monitoring report, including the claimed emission reductions for the project/MR/,
- the emission reduction calculation spreadsheet/XLS/.

Other supporting documents, such as publicly available information on the UNFCCC website and background information were also reviewed.

3.7. On-site assessment

As most essential part of the verification exercise it is indispensable to carry out an inspection on site in order to verify that the project is implemented in accordance with the applicable criteria. Furthermore the on-site assessment is necessary to check the monitoring data with respect to accuracy to ensure the calculation of emission reductions. The main tasks covered during the site visit include, but are not limited to:

- The on-site assessment included an investigation of whether all relevant equipment is installed and works as anticipated.
- The operating staff was interviewed and observed in order to check the risks of inappropriate operation and data collection procedures.
- Information processes for generating, aggregating and reporting the selected monitored parameters were reviewed.
- The duly calibration of all metering equipment was checked.
- The monitoring processes, routines and documentations were audited to check their proper application.
- The monitoring data were checked completely.
- The data aggregation trails were checked via spot sample down to the level of the meter recordings.

The complete verification team attended the site visit.

Before and during the on-site visit the verification team performed interviews with the project participants to confirm selected information and to resolve issues identified in the document review.

Representatives of Huaneng Henan Zhongyuan Gas Power Company Ltd. (project owner), Beijing MD Energy Technology Co., Ltd. (project consultant) and Carbon Asset Management Sweden AB (CERs buyer) including the operational staff of the plant were interviewed. The main topics of the interviews are summarised in Table 3-4.

Table 3-4: Interviewed persons and interview topics

Interviewed Persons / Entities	Interview topics
1. Projects & Operations Personnel, Huaneng Henan Zhongyuan Gas Power Company Ltd. /IM01/	• General aspects of the project • Technical equipment and operation • Changes since validation / previous verification • Monitoring and measurement equipment

Interviewed Persons / Entities	Interview topics
2. Consultant, Beijing MD Energy Technology Co., Ltd. /IM02/ 3. CERs buyer, Carbon Asset Management Sweden AB /IM03/ 4. Gas Supplier, Petro China Company Limited /IM04/	• Remaining issues from validation/ previous verification • Calibration procedures • Quality management system • Involved personnel and responsibilities • Training and practice of the operational personnel • Implementation of the monitoring plan • Monitoring data management • Data uncertainty and residual risks • GHG emission reduction calculation • Procedural aspects of the verification • Maintenance • Environmental aspects

3.8. Draft verification reporting

On the basis of the desk review, the on-site visit, follow-up interviews and further background investigation the verification protocol is completed. This protocol together with a general project and procedural description of the verification and a detailed list of the verification findings forms the draft verification report. This report is sent to the client for resolution of raised CARs, CLs and FARs.

3.9. Resolution of CARs, CLs and FARs

Nonconformities raised during the verification can either be seen as a non-fulfilment of criteria ensuring the proper implementation of a project or where a risk to deliver high quality emission reductions is identified.

Corrective Action Requests (CARs) are issued, if:

- Non-conformities with the monitoring plan or methodology are found in monitoring and reporting, or if the evidence provided to prove conformity is insufficient;
- Mistakes have been made in applying assumptions, data or calculations of emission reductions which will impair the estimate of emission reductions;
- Issues identified in a FAR during validation or previous verifications requiring actions by the project participants to be verified during verification have not been resolved.

The verification team uses the term Clarification Request (CL), which is be issued if:

- information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

Forward Action Requests (FAR) indicate essential risks for further periodic verifications. Forward Action Requests are issued, if:

- the monitoring and reporting require attention and / or adjustment for the next verification period.

For a detailed list of all CARs, CLs and FARs raised in the course of the verification pl. refer to chapter 4.

3.10. Final reporting

Upon successful closure of all raised CARs and CLs the final verification report including a positive verification opinion can be issued. In case not all essential issues could finally be resolved, a final report including a negative verification opinion is issued.

The final report summarizes the final assessments w.r.t. all applicable criteria.

3.11. Technical review

Before submission of the final verification report a technical review of the whole verification procedure is carried out. The technical reviewer is a competent GHG auditor being appointed for the scope this project falls under. The technical reviewer is not considered to be part of the verification team and thus not involved in the decision making process up to the technical review.

As a result of the technical review process the verification opinion and the topic specific assessments as prepared by the verification team leader may be confirmed or revised. Furthermore reporting improvements might be achieved.

3.12. Final approval

After successful technical review an overall (esp. procedural) assessment of the complete verification will be carried out by a senior assessor located in the accredited premises of TÜV NORD.

After this step the request for issuance can be started.

4. VERIFICATION FINDINGS

In the following paragraphs the findings from the desk review of the monitoring report/MR/, the calculation spreadsheet/XLS/, PDD/PDD/, the Validation Report/VAL/ and other supporting documents, as well as from the on-site assessment and the interviews are summarised.

The summary of CAR, CL and FAR issued are shown in Table 4-1:

Table 4-1: Summary of CAR, CL and FAR

Verification topic	No. of CAR	No. of CL	No. of FAR
A – General description of the project activity	1	1	0
B – Implementation of the project activity	0	0	0
C – Description of the monitoring system	0	0	0
D – Data and parameters monitored	1	0	0
E - Emission Reductions Calculation	1	0	0
SUM	**3**	**1**	**0**

The following tables include all raised CARs, CLs and FARs and the assessments of the same by the verification team. For an in depth evaluation of all verification items it should be referred to the verification protocols (see Annex).

Finding:	**A1**		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	As per the *Guidelines for completing the monitoring report form (CDM-MR)* Ver.01 EB54 Annex 34A, a brief description of the installed technology and equipment should be addressed in A.1 of MR.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The brief description of the installed technology and equipment can be described as follows: The NGCC technology adopted in the project consists of two phases of combined dynamic cycles for electricity generation: Gas Cycle and Steam Cycle. Two phases of the cycles are combined to generate electricity with quite high efficiency. It has been added in Section A.1 of the revised MR according to the *Guidelines for completing the monitoring report form (CDM-MR)*		

Finding:	**A1**
	Ver.01 EB54 Annex 34A.
DOE Assessment #1 *The assessment shall encompass all open issues in annex A-2. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	Upon checking the updated MR and according to on-site investigation, it is confirmation that the technical description of the project is in accordance with the registered PDD and actual implementation status of the project. Hence CL A1 is assessed as closed.
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the next periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Finding:	**A2**		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	The following issues regarding project participants were obserbed: 1. PP from another Annex I country-Switzerland is missing compared with the information on the UNFCCC website. 2. The name of PP from host party is inconsistent with the information on the UNFCCC website.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	1. It is revised in the updated MR. 2. It has been revisied as “Huaneng Henan Zhongyuan Gas Power Company Ltd.” consistent with the information on the UNFCCC website.		
DOE Assessment #1 *The assessment shall encompass all open issues in annex A-2. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	1. The list of PPs in the revised MR has been checked to be correct. Annex I party-Switzerland, Carbon Asset Management Sweden AB was added that´s consistent with the UNFCCC website. 2. The name of PP from host party was revised to be consistent with the information on UNFCCC website. Hence, CAR A2 is assessed as closed out.		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the next periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements		

Finding:	**D1**		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	1. The value of $EF_{CO2,NG,y}$ applied in $COEF_{NG,y}$ calculation formula is the CO_2 emission not Carbon content. The correct default value for natural gas CO_2 emission factor cited from 2006 IPCC of 0.0561tCO_2/GJ has not been applied. 2. The emission reduction calculation spreadsheet needs to be		

Finding:	D1
	revised accordingly.
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	1. According to table 1.4, chapter 1, volume 2 of 2006 IPCC, the value of $EF_{CO2,NG,y}$ applied for $COEF_{NG,y}$ calculation has been corrected to 0.0561tCO_2/GJ in the revised MR. 2. The emission reduction calculation spreadsheet has been revised accordingly.
DOE Assessment #1 *The assessment shall encompass all open issues in annex A-2. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	Upon checking the updated MR and Emission Reduction spreadsheet, it is confirmed that: 1. The correct value of 0.0561tCO_2/GJ for $EF_{CO2,NG,y}$ was applied for CO_2 emission coefficient for natural gas calculation formula, $COEF_{NG,y} = NCV_{NG,y} \times EF_{CO2,NG,y} \times OXID_{NG}$. 2. The Emission Reduction spreadsheet was corrected accordingly. Hence CAR D1 is closed successfully.
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the next periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements

Finding:	E1		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	The comparison of actual emission reduction during the whole year during 2010-04-01 to 2011-03-31 with estimate as per the registered PDD should be transparently addressed in MR.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The comparison of the actual emission reduction during the whole year during 01/04/2010 to 31/03/2011, with that estimated in the CDM-PDD was shown in the table below.		

Item	Values applied in ex-ante calculation of the registered CDM-PDD	Actual values reached during the whole year (01/04/2010 to 31/03/2011)
Emission reductions (tCO_2e)	858,165	450,162

The result showed that the actual emission reduction achieved during the whole year is less than that estimated in the CDM-PDD by 47.54%.

The comparison of actual emission reduction during the whole year during 2010-04-01 to 2011-03-31 with estimate as per the registered PDD has been added in the revised MR.

DOE Assessment #1 *The assessment shall encompass all open issues in annex A-2. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	**Whole year emission reduction comparison** The actual emission reduction of the project from April 2010 to March 2011 is calculated as 450,162 tCO_{2e}, which is 47.54% lower than the estimation as per the registered PDD. TÜV NORD confirms that the whole year emission reduction comparison isl correct and appropriately addressed in the updated

Finding:	E1
	MR. Hence, CAR E1 is closed.
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the next periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements

5. SUMMARY OF VERIFICATION ASSESSMENTS

The following paragraphs include the summary of the final verification assessments after all CARs and CRs are closed out. For details of the assessments pl. refer to the discussion of the verification findings in chapter 4 and the verification protocol (Annex 1).

5.1. Implementation of the project

✧ Operation Condition

During the monitoring period covering 2010-12-01 to 2011-03-31 the project exported 759,359.97 MWh of net electricity to Henan grid then to CCPG and consumed 151,288,576 Nm^3 natural gas. These were verified by the verification team during the on-site visit by checking the daily gas meter reading/DGM/, monthly meter reading/MMR/, electricity balance sheet/EBS/, electricity sale and purchase invoice/EBS/, meter calibration certificates/CAL/ and plant operation records/LOG/.

The project started commercial electricity generation in June 2007 after #1 gas turbine finished its trial operation. #1 steam turbine, #2 gas turbine and #2 steam turbine started grid-connected electricity generation in August 2007, December 2007 and January 2008 respectively.

Electricity generated by #1 and 2# NGCC are transmitted to 500kV Chaya Substation then CCPG after boosted from 21kV to 500kV through two on-site main transformers. CCPG contains Henan grid, Hubei grid, Hunan Grid, Jiangxi grid, Sichuan grid and Chongqing grid.

All required equipments and procedures are available and implemented in an appropriate manner. All necessary monitoring instruments are installed. The measuring devices are well known and state of the art. All required instruments including stand by and operating procedures have been implemented in an appropriate manner.

During the verification a site visit was carried out. On the basis of this site visit and the reviewed project documentation it can be confirmed that w.r.t. the realized technology, the project equipments, as well as the monitoring and metering equipment, the project has been implemented and operated as described in the registered PDD/PDD/. There are no major changes in the key equipment since the validation of the project.

✧ CDM Monitoring

For the electric metering purpose, three sealed meters are involved in CDM monitoring system. The gateway meter No.1 and its backup meter No.2 are all bidirectional, which are installed at 500kV Chaya substation with accuracy of 0.2S. The meter No.1 and No.2 are used as invoice meters measuring electricity exportation and importation. The cut-off time is set at 0:00 h on the first day monthly.

Meter No.3 with accuracy of 0.2S is located at project site and used for measuring the imported electricity purchased from grid in case the electricity is necessary for power units start up. The electricity is measured continuously and recorded monthly. The meter reading is jointly read by the grid company and PP and confirmed by both sides. The net electricity supplied to grid by Zhumadian NGCC project monitored through the three meters is calculated as :

$EG_{net,pj,y}=EG_{export,M1} – EG_{import,M1}– EG_{import,M3}$

The data used for emission reduction calculation is derived from Monthly Electricity Exportation and Importation Notes issued by grid company. The data in electricity sales and purchase invoice/EBS/ formed the emission reduction calculation basis. During this monitoring period, there is no malfunction detected for meter No.1 and No.2. All the three meters are calibrated quarterly by a third party institute. The calibration is valid during this monitoring period. Neither mistakes nor malfunction have been observed during this monitoring period.

Table 5-1: Electric Meters information

	Model	Serial No.	Accuracy	Calibration date	Calibration valid until	Calibration entity
Meter No.1	WU.TE 432S	18450580	0.2S	2010-10-14	2011-01-13	Henan Electric Power Research Institute, which is authorized by Administration of Quality & Technology Supervision of Henan Province. Certificate no. Yu Ji[2006]Shou0035.
				2011-01-12	2011-04-11	
Meter No.2	WU.TE 432S	18450567	0.2S	2010-10-14	2011-01-13	
				2011-01-12	2011-04-11	
Meter No.3	SL7000	33049113	0.2S	2010-10-14	2011-01-13	
				2011-01-12	2011-04-11	

For the natural gas metering purpose, six gas flow meters are involved in CDM monitoring system. Gas meter #1 and #2 located at the gas supplier terminal used for measuring the natural gas consumption with accuracy of 1.0. The readings of the two turbo type gas meters are as the basis for settlement. The gas consumption is measured continuously and recorded daily at the gas supplier side. The meter reading records are confirmed by the Gas Company and PP jointly. The two meters are calibrated annually by a third party. Neither mistakes nor malfunction have been observed during this monitoring period.

For backup, ultrasonic gas flow meter #3, #4, #5, #6 have been installed on 2010-11-21 to replaced the previous four turbo gas flow meter during the 3rd periodic monitoring period. The newly installed ultrasonic gas flow meters (with type CL-2-2-250 and accuracy 1.0) have been calibrated before installation. After the installation,

the meters are calibrated annually and the meter reading will be recorded on daily basis/DGM/. The installation of the four backup gas flow meters is fully consistent with the registered PDD.

During the 4th monitoring period, the gas consumption value applied for ER calculation was from gas flow meter #1 and #2. No malfunction was detected to #1 and #2. The value has been cross-checked by the data from the backup gas flow meters.

Table 5-2: Gas Flow Meters information

	Model	Serial No.	Accu-racy	Calibration date	Calibration valid until	Calibration entity
Gas flow meter #1	TRZ-IFSG14000DN300ANSI600	83034891	1.0	2009-12-08	2010-12-07	Henan Institute of Metrology and Testing, authorized by General Administration of Quality Supervision,Inspec-tion and Quarantine of People's Republic of China. Certificate no. (Guo) Fa Ji (2007)01031.
				2010-12-06	2011-12-05	
Gas flow meter #2		83034059	1.0	2010-11-17	2011-11-16	

The measurement of NCV of natural gas is carried out by an on-line gas-phase chromatograph by acquiring the gas sample from the continuous operated sampling line which is linked with the gas flow at Xuedian Station of Petrol China “West-to East natural gas transmission”. The calibration records of all installed measurement devices as well as the on-line gas-phase chromatograph which covered this monitoring period were checked and assessed to be credible and appropriate.

Table 5-3: On-line gas-phase chromatograph analyzer

	Model	Serial No.	Manu-facturer	Calibration date	Calibration valid until	Calibration entity
On-line gas-chroma tograph	BTU-8000	100839	ABB	2010-05-28	2011-05-27	National Institute of Metrology of P.R. China, authorized by General Administration of Quality Supervision, Inspection and Quarantine of the People’s Republic of China.

The submitted monitoring report which forms the basis of the verification was prepared by summarizing consolidated monthly data of net electricity delivery, natural

gas consumption and NCV value over this monitoring period in accordance with the registered PDD[/PDD/].

All necessary monitoring instruments are installed as indicated in validated monitoring plan[/MP/]. The measuring devices are well known and state of the art. All required instruments including stand by and operating procedures for the same have been implemented in an appropriate manner.

The submitted monitoring report which forms the basis of the verification was prepared by summarizing consolidated monthly data over the whole monitoring period.

5.2. Project history

During the 3th periodic verification, the verifying DOE might have raised issues that could not be closed or resolved during the verification stage. For this purpose FARs might have been raised. No such issues were identified for this project.

5.3. Special events

There is no special event during the monitoring period by means of operation log check and interviewing with the project owner.

5.4. Compliance with the monitoring plan

The monitoring system and all applied procedures are completely in compliance to the registered monitoring plan.

5.5. Compliance with the monitoring methodology

The monitoring system is in compliance with the applied monitoring methodology AM0029 ver.03.

5.6. Monitoring parameters

During the verification all relevant monitoring parameters (as listed in chapter B.7.1 of the PDD) have been verified with regard to the appropriateness of the applied measurement / determination method, the correctness of the values applied for ER calculation, the accuracy, and applied QA/QC measures. The results as well as the verification procedure are described parameter-wise in the project specific verification checklist.

It can be confirmed that all monitoring parameters have been measured / determined without material misstatements and in line with all applicable standards and relevant requirements.

The monitoring report/MR/ and emission reduction spreadsheet/XLS/ are in line with the requirements of the validated monitoring plan as well as the applied methodology AM0029 Ver.03/AM0029/.

5.7. Monitoring report

The monitoring report/MR-1/ was submitted to the DOE by the project participants. The team has made this report publicly available prior to the start of the verification activities.

It can be confirmed that the monitoring report is complete and transparent and in accordance with the registered PDD and monitoring plan.

Nevertheless, CL A1 regarding brief description of the project was raised and closed.

5.8. ER Calculation

According to the validated PDD, the approved baseline and monitoring methodology AM0029 Ver.03 is applied to the project. GHG emission reduction is calculated as baseline emission minus project emission and leakage emission.

Baseline Emissions (BE_y):

The formula used for the determination of baseline emission is consistent with the PDD:

$BE_y = EF_{grid,BM,y} \times EG_{pj,y}$

$=0.4543\ tCO_{2e}/MWh \times 759,359.97\ MWh$

$=344,944.252\ tCO_{2e}$.

Following documentation were verified by the audit team:

- ✓ Latest publication of NDRC for $EF_{grid,\ BM,y}$ calculation prior to the 4th verification.
- ✓ Monthly electricity sales and purchase invoices from December 2010 to March 2011/EBS/.
- ✓ Monthly electricity exportation and importation transaction notes from December 2010 to March 2011/EBS/.
- ✓ Meters calibration records/CAL-G/ /CAL-E/

All the figures as per the monitoring report were cross-checked by the verification team against basic monitored data.

The data used for the baseline emission calculation were derived from the meter readings as well as monthly electricity balance sheets. All the data were issued or confirmed by the grid company and cross checked with the monthly invoices.

Project emission (PE_y):

The formula used for the determination of project emissions is consistent with the PDD and updated monitoring report:

PE_y $=FC_{NG,y} \times COEF_{NG,y}$

$=FC_{NG,y} \times (NCV_{NG} \times EF_{CO2,NG,y} \times OXID_{NG})$

$= 151{,}288{,}576\ Nm^3 \times 34.18206\ MJ/Nm^3 \times 0.0561\ tCO_{2e}/GJ \times 1 /1000$

$= 290{,}113.031\ tCO_{2e}$.

Following documents/records were verified by the audit team:

- ✓ Monthly NG invoices from December 2010 to March 2011/GBS/.
- ✓ Daily gas meter reading/DGM/.
- ✓ Monthly gas meter reading from December 2010 to March 2011/MMR/.
- ✓ Gas meters calibration records covering this monitoring period./CAL/

The data used for the project emission calculation were derived from the gas meter readings and cross checked with natural gas balance sheets. All the data were issued or confirmed by the gas supplier and cross checked by the monthly invoices.

No other fuel was used during the monitoring period.

Leakage (LE_y):

The formula used for the determination of project leakage which is consistent with the methodology and the monitoring report is as following:

LE_y $= LE_{CH4,y}$

$= (FC_y \times NCV_{NG,y} \times EF_{NG,upstream,CH4} - EG_{pj,y} \times EF_{BL,upstream,CH4}) \times GWP_{CH4}$

$= (1530.72\ tCH_4 - 2386.914\ tCH_4) \times 21\ tCO_{2e}/tCH_4 \quad <0$

According to AM0029, ver.03, negative leakage should be considered as zero. Therefore, leakage during this monitoring period is zero.

Emission reduction (ER):

ER_y $= BE_y - PE_y - LE_y$

$= 344{,}944.252\ tCO_{2e} - 290{,}113.031\ tCO_{2e} - 0\ tCO_2e$

$= 54{,}881\ tCO_2e$

All relevant evidence was checked by the verification team during the on-site visit. All evidence is clearly identified and assessed to be reliable.

Nevertheless, CAR D1 regarding emission reduction calculation was raised and closed.

5.9. Quality Management

The monitoring personnel have been trained monthly regarding the aspects of grid dispatching, hydropower plant operation management, central control room malfunction detection, electric connection schematic, electro circuit, safety regulation, anti-accident exercise etc.

Documents list was established and all monitored data are archived both in physical (daily data) and in electronic form. The data will be kept for the whole crediting period and additional 2 years as given in the PDD.

Meters calibration plan was established and followed. The electric meters are calibrated quarterly, the gas flow meters and gas-phase chromatograph analyzer are calibrated yearly. The calibration records covering the monitoring period were maintained. No deviations thereof have been observed during the verification.

All necessary and request documentation was provided by the project participants so that a complete verification of all relevant issues could be carried out.

Access was granted to all installations o the plant with are relevant for the project performance and monitoring activities.

5.10. Comparison with ex-ante estimated emission reductions

The updated MR includes a comparison of the calculated actual emission reductions with the ex-ante calculated values in the registered PDD.

The emission reduction during the 4th monitoring period is 80.71% lower than the estimation in the registered PDD. Taken the emission reduction for the whole year from 2010-04-01 to 2011-03-31 into account, it is 47.54% lower than the estimation in registered PDD.

The calculated value was found to be proportionally lower than the ex-post determined value, thus no further justification was required.

Nevertheless, CAR D1 regarding whole year emission reduction comparison was raised and appropriated corrective action were taken, this CAR is closed successfully.

5.11. Overall Aspects of the Verification

All necessary and requested documentation was provided by the project participants so that a complete verification of all relevant issues could be carried out.

Access was granted to all installations of the plant which are relevant for the project performance and the monitoring activities.

The operation and monitoring of the project are in compliance with the registered PDD and monitoring plan. All raised CARs and CLs are successfully closed out.

No issues have been identified indicating that the implementation of the project activity and the steps to claim emission reductions are not compliant with the UNFCCC criteria and relevant guidance provided by COP/CMP and the CDM EB (clarifications and/or guidance).

5.12. Hints for next periodic Verification

There is no hint for next periodic verification.

6. VERIFICATION OPINION

Carbon Asset Management Sweden AB has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 4th periodic verification of the project: "Zhumadian Zhongyuan Gas-Steam Combined Cycle Power Project in Henan China", with regard to the relevant requirements for CDM project activities. The project activity generates electricity utilizing available natural gas at the project site to avoid GHG emissions. This verification covers the period from 2010-12-01 to 2011-03-31 (including both days).

In the course of the verification 3 Corrective Action Requests (CAR) and 1 Clarification Requests (CL) were raised and successfully closed. Furthermore no FARs are raised to improve the monitoring system in the future. The verification is based on the draft monitoring report, revised monitoring report, the monitoring plan as set out in the registered PDD, the validation report, emission reduction calculation spreadsheet and supporting documents made available to the TÜV NORD JI/CDM CP by the project participant.

As a result of this verification, the verifier confirms that:

- all operations of the project are implemented and installed as planned and described in the validated project design document.
- the monitoring plan is in accordance with the applied approved CDM methodology ,i.e., AM0029 Ver.03
- the installed equipment essential for measuring parameters required for calculating emission reductions are calibrated appropriately.
- the monitoring system is in place and functional. The project has generated GHG emission reductions.

As the result of the 4th periodic verification, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. TÜV NORD JI/CDM CP herewith confirms that the project has achieved emission reductions in the above mentioned reporting period as follows:

Emission reductions: **54,881** t CO_{2e}

Shanghai, 2011-08-24

Jessica Huang

Huang Jie

TÜV NORD JI/CDM Certification Program

Verification Team Leader

Essen, 2011-08-24

Martin Saalmann

TÜV NORD JI/CDM Certification Program

Final Approval

7. REFERENCES

Table 7-1: Documents provided by the project participant(s)

Reference	Document
/CAL-E/	Electrical meters calibration: 1. Main meter 1#, installed at 500kV Chaya substation, serial no. 18450580, accuracy 0.2S, 2. Backup meter 2#, installed at 500kV Chaya Substation, serial no. 18450567, accuracy 0.2S, 3. Meter 3#, serial no. 33049113, accuracy 0.2S, certificate no. GKB2010-771. The three meters were all calibrated by Henan Electric Power Research Institute on 2010-10-14 and 2011-01-12. The entity has the qualification certificate on metrological authorized by General Administration of Quality Supervision,Inspection and Quarantine of People's Republic of China on 2006-12-10 valid until 2011-12-09. certificate no. Yu Ji[2006] Shou 0035.
/CAL-G/	Gas flow meters calibration: 1. Gas flow meters 1#, 2#: accuracy 1.0, calibrated by Henan Institute of Metrology and Testing, calibrated code: JJG1037-2008. 1#, serial no. 83034891, • certificate no. Qi Liu Zi 20100110-054 on 2009-12-08. • certificate no. Qi Liu Zi 20100110-083 on 2010-12-06. 2#, serial no. 83034059, certificate no. Qi Liu Zi 20101210-114 on 2010-11-17. The entity has the qualification certificate on metrological, authorized by Administration of Quality and Technology Supervision of Henan Province on 2007-11-31 valid until 2012-11-30. Certificate no. (Guo) Fa Ji (2007)01031. 2. Gas flow meters, 3#~6#. Calibrated by Flow Measurement Center of Aviation Industries of China on 2010-10-29. 3#, serial no. 1104-001, certificate no. (Qi) 2010995. 4#, serial no. 1104-002, certificate no. (Qi) 2010996. 5#, serial no. 1104-003, certificate no. (Qi) 2010997. 6#, serial no. 1104-004. certificate no. (Qi) 2010998. The entity has the qualification certificate Class-B issued by State Commission of Science and Technology for National Defence Industry, certificate no. XKGuo Fang-JLJG-2-028. 3. On-line gas chromatograph analyzer for NCV analyze, model, BTU8000, calibrated by National Institute of Metrology of P.R. China on 2010-05-28. The entity has the qualification certificate on metrological authorized by General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China on 2007-12-01 valid until 2012-11-30.
/DGM/	Daily gas meter readings: Daily gas flow meter 3#, 4#, 5#, 6# covering 2010-12-01 to 2011-03-31.

Reference	Document
/EBS/	Electricity Balance Sheets: 1. Monthly Electricity Exportation Transaction Notes covering this monitoring period, issued by Henan Electric Power Company. 2. Monthly Electricity Importation Transaction Notes covering this monitoring period, issued by Henan Electric Power Company. 3. Monthly Electricity Sales Invoice, issued by Huaneng Henan Zhongyuan Gas Power Company Ltd. 4. Monthly Electricity purchase Invoice, issued by Henan Electric Power Company Zhumadian Power Company.
/GBS/	1. Monthly gas invoices from December 2010 to March 2011 issued by Petrol China. 2. Monthly gas balance sheet from December 2010 to March 2011 issued by Petrol China.
/LOG/	Operation log, 1. Plant operation records. 2. Hourly gas flow record and summarized monthly by gas supplier terminal.
/LGS/	Letter from gas supplier which confirms the Gas composition data is not available.
/MM/	CDM Monitoring Manual, compiled by Huaneng Henan Zhongyuan Gas Power Company Ltd. dated 2011-01-01.
/MMR/	Monthly Meter Reading: 1. NCV reading records every ten days and weighted calculated monthly, from December 2010 to March 2011, confirmed by Petrol China Company Ltd. 2. Monthly gas flow meter #1 and 2# reading installed at the gas supplier, from December 2010 to March 2011, issued by Pipes Company, Petrol China Company Ltd.
/MR/	Monitoring report 'Zhumadian Zhongyuan Gas-Steam Combined Cycle Power Project in Henan China' 1. Hosted version 1 dated 2011-04-06. 2. Final version 5 dated 2011-08-24.
/OLM/	On-line monitoring system: 1. Hourly gas flow rate of gas flow meter 1#, 2#, recorded in Gas supplier terminal. 2. Temperature, pressure of gas in gas turbine, temperature, pressure and flow rate of steam in steam turbine
/OMR/	NGCC Operation Safety Management Regulation, compiled by Huaneng Henan Zhongyuan Gas Power Company Ltd.

Reference	Document
/O&M/	Sample copy of Project Operation & Maintenance Record/Equipments Check & Maintenance Log
/PPSC/	1. High-voltage power purchase and sale contract signed by Huaneng Zhongyuan Gas Power Plant and Henan Electric Power Company on 2009-01-01. 2. Gas Purchase contract, signed by Huaneng Zhongyuan Gas Power Plant and Petrol China Company Ltd. On 2009-10-08.
/PWD/	1. Main Electric Wiring schematic 2. Gas pipeline connection diagram
/RTC/	Responsibilities, Training and Competence record: 1. Training record and attendance list held on 2011-02-15. 2. Sample copy of Operator certificates. 3. Project organization chart and responsibilities.
/XLS/	Emission Reduction calculation spreadsheet

Table 7-2: Background investigation and assessment documents

Reference	Document
/AM29/	Approved CDM Methodology AM0029, version 03: “Baseline Methodology for Grid Connected Electricity Generation Plants using Natural Gas”
/CPM/	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)
/IPCC/	1. 1996 IPCC Guidelines for National Greenhouse Gas Inventories: work book 2. 2006 IPCC Guidelines for National Greenhouse Gas Inventories: work book
/KP/	Kyoto Protocol (1997)
/MA/	Decision 3/CMP. 1 (Marrakesh – Accords)
/PDD/	Project Design Document for CDM project: “Zhumadian Zhongyuan Gas-Steam Combined Cycle Power Project in Henan China” version 9, dated 2009-8-14
/VAL/	Validation Report for CDM project “Zhumadian Zhongyuan Gas-Steam Combined Cycle Power Project in Henan China” version 5, dated 2009-8-24.

Reference	Document
/VER/	Documents of previous verifications (Monitoring report, verification report, ER calculation sheet)
/VVM/	UNFCCC Validation and Verification Manual (Version 01.2, EB 55)

Table 7-3: Websites used

Reference	Link	Organisation
/dna/	http://cdm.ccchina.gov.cn/english/index.asp	National Development and Reform Commission (DNA of China)
/unfccc/	http://cdm.unfccc.int	UNFCCC
/ipcc/	www.ipcc-nggip.iges.or.jp	IPCC publications

Table 7-4: List of interviewed persons

Reference	MoI[1]		Name	Organisation / Function
/IM01/	V	☒ Mr. ☐ Ms	Chen Zhiqiang	Huaneng Henan Zhongyuan Gas Power Company Ltd./CDM Project Manager
/IM01/	V	☒ Mr. ☐ Ms	Liu Shuai	Huaneng Henan Zhongyuan Gas Power Company Ltd./Maintenance Department
/IM01/	V	☒ Mr. ☐ Ms	Guan Weihong	Huaneng Henan Zhongyuan Gas Power Company Ltd./Operation Department
/IM02/	V	☐ Mr. ☒ Ms.	Lai Xiaochao	Beijing MD Energy Technology Co., Ltd./CDM Assistant
/IM02/	V	☒ Mr. ☐ Ms.	Sun Yangyang	Beijing MD Energy Technology Co., Ltd./Project Manager
/IM03/	V	☒ Mr. ☐ Ms.	Shi Weiwei	Carbon Asset Management Sweden AB /Project Manager
/IM04/	V	☒ Mr. ☐ Ms.	Cao Yaozhun	Petro China Company Limited/ Natural Gas Supply Station Operator

[1] Means of Interview: (**T**elephone, **E**-Mail, **V**isit)

ANNEX

A1: Verification Protocol

A2: Appointment / Authorisation statements

ANNEX 1: VERIFICATION PROTOCOL

Table A-1: GHG calculation procedures and management control testing / detailed audit testing of residual risk areas and random testing

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks	Additional verification testing	Conclusions and Areas Requiring Improvement (including *Forward Action Requests*)
Raw data generation				
• Installation of measuring equipment • Dysfunction of installed equipment • Maloperation by operational personnel • Downtimes of equipment • Exchange of equipment • Change of measurement equipment characteristic • Insufficient accuracy • Change of	• Installation of modern and state of the art equipment • Process control automation • Internal data review • Regular visual inspect-ions of installed equip-ment • Only skilled and trained personnel operates the relevant equipment • Daily raw data checks • Immediate exchange of dysfunctional equipment	• Inadequate installation / operation of the monitoring equipment • Inadequate exchange of equipment • Change of personnel • Undetected measurement errors • Inappropriateness of Management system procedures w.r.t. monitoring plan requirements (e.g. substitute value strategies) • Non-application of management system procedures	• Site – visit • Check of equipment • Check of technical data sheets • Check of suppliers information / guarantees • Check of calibration records, if applicable • Check of maintenance records • Counter-check of raw data and commercial data • Check of CDM management system • Check of CDM related	• **See Table A-2**

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks	Additional verification testing	Conclusions and Areas Requiring Improvement (including *Forward Action Requests*)
technology • Accuracy of values supplied by Third Parties	• Stand-by duty is organized • Training • Internal audit procedures • Internal check of QA/QC measures of involved Third Parties	• Insufficient accuracy • Inappropriate QA/QC measures of Third Parties	procedures • Application of CDM management system procedures • Check of trainings • Check of responsibilities • Check of QA/QC documentation / evidences of involved Third Parties	
Raw data collection and data aggregation				
• Wrong data transfer from raw data to daily and monthly aggregated reporting forms • IT Systems • Spread sheet programming • Manual data transmission • Data protection	• Cross-check of data • Plausibility checks of various parameters. • Appropriate archiving system • Clear allocation of responsibilities • Application of CDM Management system procedures • Usage of standard	• Unintended usage of old data that has been revised • Incomplete documentation • Ex-post corrections of records • Ambiguous sources of information • Non-application of management system procedures • Manual data transfer	• Check of data aggregation steps • Counter-calculation • Data integrity checks by means of graphical data analysis and calculation of specific performance figures • Check of management system certification • Check of data archiving	• **See Table A-2**

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks	Additional verification testing	Conclusions and Areas Requiring Improvement (including *Forward Action Requests*)
• Responsibilities	software solutions (Spreadsheets) • Limited access to IT systems • Data protection procedures	mistakes • Unintended change of spread sheet programming or data base entries • Problems caused by updating/upgrading or change of applied software	system • Check of application of Management system procedures	
Other calculation parameters				
• Emission factors, oxidation factors, coefficients	• The values and data sources applied are defined in the PDD and monitoring plan	• Unintended or intended Modification of calculation parameters • Wrong application of values • Misinterpretations of the applied methodology and/ or the PDD • Missing update of applicable regulatory framework (e.g. IPCC values)	• Update-check of regulatory framework • Countercheck of the applied MP in the MR against the methodology and the PDD	• **See Table A-2**

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks	Additional verification testing	Conclusions and Areas Requiring Improvement (including *Forward Action Requests*)
Calculation Methods				
• Applied formulae • Miscalculation • Mistakes in spread-sheet calculation	• Advanced calculation and reporting tools • A CDM coordinator is in charge of the CDM related calculations • Usage of tested / counterchecked Excel spreadsheets • Involvement of external consultants	• The danger of miscal-culation can only be minimized.	• Countercheck on the basis of own calculation. • Spread sheet walk-trough. • Plausibility checks • Check of plots	• **See Table A-2**
Monitoring reporting				
• Data transfer to the author of the monitoring report • Data transfer to the monitoring report • Unintended use of outdated versions	• An experienced CDM consultant is responsible for monitoring reporting. • CDM QMS procedures are defined	• The danger of data transfer mistakes can only be minimized • Inappropriate application of QMS procedures	• Counter check with evidences provided. • Audit of procedure application	• **See Table A-2**

Table A-2: (Project specific) Periodic Verification Checklist

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
A. General Description of the project activity				
A.1. Brief description of the project activity ***(EB 54 Annex 34, A.1)*** *Check if section A.1 of the MR includes the following:* • *Purpose of the PA and the measures taken to reduce GHG emissions* • *Brief description of the installed technology and equipments* • *Relevant dates for the project activity (e.g. construction, commissioning, continued operation periods etc.* • *Total emission reductions achieved in this monitoring period*	/MR/	The verification team has checked section A.1 of the MR and confirms that the information provided is complete and correct with regards to the following: ☒ Purpose of the PA and the measures taken to reduce GHG emissions ☐ Brief description of the installed technology and equipments ☒ Relevant dates for the project activity (e.g. construction, commissioning, continued operation periods etc ☒ Total emission reductions achieved in this monitoring period In this context the following findings have been identified: CL A1 was raised.	~~CL A1~~	OK
A.2. Project Participants ***(EB 54 Annex 34, A.2)*** *Check if section A.2 of the MR includes the following:* • *All PPs as displayed on the UNFCCC website*	/MR/ /unfccc/	The verification team has checked section A.2 of the MR and confirms that the information provided is incomplete and it was addressed in CAR A2: ☐ All PPs as displayed on the project related UNFCCC website are correctly listed In this context the following findings have been identified:	~~CAR A2~~	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
		CAR A2 was raised.		
A.3. Location of the Project Activity ***(EB 54 Annex 34, A.3)*** *Check if section A.3 of the MR reflects correctly the following:* • *Address of the project location* • *Latitude and Longitude*	/MR/ /PDD/ /IM/	The verification team has checked section A.3 of the MR and confirms by means of comparison with the information given in the PDD and information gathered during the site visit that the information provided is complete and correct with regards to the following: ☒ The address has been correctly given in the MR ☒ Latitude and Longitude are in line with the information given in the PDD and reflects the actual location of the PA.	OK	OK
A.4. Technical description of the project ***(EB 54 Annex 34, A.4)*** *Check if section A.4 of the MR correctly describes / includes the following:* • *Detailed description of the technology applied* • *Diagrams*	/MR/ /PDD/ /IM/	The verification team has checked section A.4 of the MR and confirms by means of comparison with the information given in the PDD and information gathered during the site visit that the information provided is complete and correct with regards to the following: ☒ The description of the technology applied is complete and appropriate ☒ Appropriate diagrams have been included in the description	OK	OK
A.5. Title, reference and version of the baseline and monitoring methodology applied to the project ***(EB 54 Annex 34, A.5)*** *Check if section A.5 of the MR correctly describes / includes the following:*	/MR/ /PDD/ /unfccc/	The verification team has checked section A.5 of the MR and confirms by means of comparison with the information given in the PDD and displayed on the UNFCCC website that the information provided is complete and correct with regards to the following: ☒ Name and version of the applicable CDM Methodology	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
• *Reference to the applicable version of the methodology* • *Reference to the applicable version(s) of relevant methodological tools* • *Relevant EB decisions, if applicable*		☒ Name and version of applicable CDM methodological tools ☒ Relevant EB decisions		
A.6. Registration date of the project activity ***(EB 54 Annex 34, A.6)*** *Check if section A.6 of the MR correctly includes the following:* • *Registration date*	/MR/ /unfccc/	The verification team has checked section A.6 of the MR and confirms by means of comparison with the information displayed on the UNFCCC website that the information provided is complete and correct with regards to the following: ☒ Registration date	OK	OK
A.7. Crediting period of the PA and related information ***(EB 54 Annex 34, A.7)*** *Check if section A.7 of the MR correctly includes the following:* • *Start date of the crediting period. In this context please check, if applicable, whether post registration changes to the start date have been accepted by the EB.* • *Length and type of the crediting period*	*/MR/* */unfccc/*	*The verification team ha*s checked section A.7 of the MR and confirms by means of comparison with the information displayed on the UNFCCC website that the information provided is complete and correct with regards to the following: ☒ Start date of the crediting period. ☒ Type and length of the crediting period	OK	OK
A.8. Name of the responsible person(s) / entity/(ies) ***(EB 54 Annex 34, A.8)***	/MR/ /IM/	The verification team has checked section A.8 of the MR and confirms by means of interviews with the PP that the information provided is complete and correct with regards to the following:	OK	OK

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
Check if section A.8 of the MR correctly includes the following: • *Contact information of the person(s)/entity(ies) responsible for completing the MR.*		☒ Contact information of the person(s) / entity/(ies) responsible for completing the MR..		
B. Implementation of the project activity				
B.1. Implementation status of the project				
B.1.1. Initial project implementation ***(EB 55 Annex 1, §§ 182, 195-201)*** *Assess whether the project has been implemented and operated as per the registered PDD and are all physical features of the project in place?* *Further focus on the potential phase wise implementation and check the reporting on the corresponding status and starting dates accordingly.* *Also, discuss – if applicable – any approvals of the necessary request of notification or request for approval of changes from the project activity as described in the registered PDD (EB 48 Annex 66/67).*	/IM01/ /PDD/ /TPR/ /AM29/	*Description:* The operation status of set 1# and 2# of NGCC can be seen from screen in Central Control Room. The presented real time output of the gas turbine and steam turbine, the temperature and pressure of the flow gas in gas turbine, steam in steam turbine are checked by the verification team. The on-line monitoring system was checked. All the infrastructures required were all established. *Justification of evidences:* By means of documents review, like PDD; MR, and on-site investigation. It was verified reliable. *Conclusion:* The operation is implemented in line with the registered PDD. The main technical specifications of main equipment i.e. gas turbine, steam turbine including capacity and output is consistent with the PDD.	OK	OK
B.1.2. Technical equipment changes ***(EB 55 Annex 1, § 187)*** *Check if relevant technical equipment of the project activity has been exchanged or modified during the*	/IM01/ /PDD/ /LOG/	*Description:* The technical equipment including type and capacity of gas, steam turbines and generators, measurement instruments, transformer etc. haven't been changed and are consistent with those in registered PDD. The key equipments	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
monitoring period. Further ensure that consistent notations of key equipment (meters etc.) in PDD, MR and calculation spreadsheet are applied *Consider e.g. interviews with operational personnel, QMS records, maintenance records, instrument specifications.* *In case of changes, check whether the project is still in line with the registered PDD and assure that these changes have been considered in the monitoring report and the emission reduction calculation.* *Also, discuss –if applicable- any approvals of the necessary request of notification or request for approval of changes from the project activity as described in the registered PDD (EB 48 Annex 66/67).*		w.r.t monitoring plan in PDD had been check. *Justification of evidences:* By means of instrument specifications check and the interview during the on-site visit. This was also crosschecked as per the plant operation log, equipments check & maintenance log and on-site investigation. *Conclusion:* No technical equipment w.r.t power generation was changed of modified within the monitoring period.		
B.1.3. Operation of the project activity ***(EB 55 Annex 1, § 195)*** *Check if relevant operation modes of the project activity have been exchanged or modified during the monitoring period.* *Consider e.g. interviews with operational personnel, operation log sheets, data management system records.* *In case of changes, check whether the project is still in line with the registered PDD and assure that these changes have been considered in the monitoring*	/IM01/ /LOG/	*Description:* The operation modes such as electricity generation, power generation measurement, gas consumption etc. haven't been changed. *Justification of evidences:* By means of interview with the operational personnel, crosschecked with the plant operation log, equipments check & maintenance log and on-site observation. *Conclusion:* No relevant operation modes were exchanges within the monitoring period.	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
report and the emission reduction calculation. *Also, discuss – if applicable – any approvals of the necessary request of notification or request for approval of changes from the project activity as described in the registered PDD (EB 48 Annex 66/67).*				
B.1.4. Incidents ***(EB 55 Annex 1, § 187, 208a)*** *Identify if there have been any significant incidents, deviant operation modes and / or downtimes of the equipment?* *Consider e.g. interviews with operational personnel, operational log sheets, analysis of performance data.*	/IM01/ /LOG/ /OLM/ /MR/	*Description:* The monitoring report provides no information that incidents happened. *Justification of evidences:* During the on-site investigation, the plant operation log, equipments check & maintenance log were checked. The operation staff was interviewed. This was also backed up by the data integrity check. *Conclusion:* No incidents during the monitoring period were observed.	OK	OK
B.1.5. Legislation Find out whether relevant legislation with effect on the project activity in the host country has been changed. Assess, in case of changes, whether consequences for the PA with regard to relevant CDM requirements have been accounted for. In case of changes data sources shall be referenced.	/IM01/ /dna/	*Description:* Relevant legislation incl. electricity generation and transmission, gas consumption related environmental protection laws, sectoral policies and relevant regulations were not changed. *Justification of evidences:* It was verified through consulting official governmental website and as per the local and sectoral expertise of the verification team. *Conclusion:* No relevant changes to related legislation since the validation were identified.	OK	OK

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
B.1.6. Open issues from validation ***(EB 55 Annex 1, §§ 181-183, 188c, 190c)*** *Check (esp. in case of 1st periodic verification) whether there are any open issues indicated in the validation report (e.g. FAR)?*	/VAL/ /VER/ /unfccc/ /IM01/	☒ There were no open issues addressed in the validation report ☐ All open issues from the validation have been appropriately addressed. ☐ The following issues related to the validation have not yet been appropriately addressed:	OK	OK
B.1.7. Open issues from previous verification ***(EB 55 Annex 1, § 193)*** *Check in case of further periodic verifications whether there are any open issues indicated in previous verification reports (FAR) and take into consideration the guidance as specified in VVM.*	/VER/ /unfccc/	☒ There were no open issues addressed in the previous verification report. ☐ All open issues from the previous verification have been appropriately addressed. ☐ The following issues related to the previous verfication have not yet been appropriately addressed:	OK	OK
B.1.8. Publication of the Monitoring Report *Check if the monitoring report has been made publicly available on the UNFCCC website before the verification commenced.* *Check if comments have been received and if yes, how they have been addressed.*	/MR/ /unfccc/	*Description:* The publication of monitoring report prior to on-site verification was verified through the confirmation of monitoring report webhosting from Executive Board of UNFCCC. The uploading date is 2011-05-14, the on-site visit started on 2011-06-20. *Justification of evidences:* The confirmation from UNFCCC verifies publishing the MR. *Conclusion:* The draft monitoring report, as received from the project participants, has been made publicly available prior to the start of the verification activities. No comments have been received.	OK	OK

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
B.2. Requests for Revisions of MP ***(EB 55 Annex 1, §§ 201, 203, 219)*** *Check (i) if there have been any requests for revisions of the monitoring plan in the past.and/or (ii) if there is a need for a RfRev. Make sure that the monitoring report reflects the application of the revision as approved by the EB, where applicable. Check in case of approved revisions if the date of approval has been included.*	/MR/ /PDD/ /XLS/	☒ No requests for revisions of the MP.have been submitted to the UNFCCC prior to the current monitoring period ☐ The following RfRev have been approved or are under approval by the UNFCCC 1 Title Status ☐ under approval; ☐ approved Appr.date 2 Title Status ☐ under approval; ☐ approved Appr.date ☒ During the verification of the current MP no need for a RfRev has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA ☐ The following revisions of the MP are to be requested from the EB for the current MP 1 Issue	OK	OK
B.3. Requests for Deviations applied to this MP ***(EB 55 Annex 1, §§ 203, 211-219)***	/MR/ /PDD/ /XLS/	☒ No requests for deviations have been submitted to the UNFCCC prior to the current monitoring period	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
Check (i) if there have been any requests for deviations in the past.and/or (ii) if there is a need for a RfDev. Make sure that the monitoring report reflects the application of the deviation as approved by the EB, where applicable. Check in case of approved deviations if the approval date and reference number has been included. *Further check in case of approved RfDev whether the MR appropriately reflects the application of the EB guidance.*		☐ The following RfDev have been approved or are under approval by the UNFCCC 1 Title Status ☐ under approval; ☐ approved Ref. No. Appr.date 2 Title Status ☐ under approval; ☐ approved Ref. No. Appr.date ☐ In case of approved guidance of the EB: The monitoring report reflects the application of the EB guidance regarding the RfDev. ☒ During the verification of the current MP no need for a RfDev has been indentified ☐ The following deviations are to be requested from the EB for the current MP 1 Issue		
B.4. Initial verification *In case an initial verification has been carried out, check if all FARs, recommendations etc. can be*	/IM02/ /MR/	☒ No initial verification has been carried out. ☐ There are no open issues, recommendations etc. pending from the initial verification	OK	OK

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
confirmed as existent for the periodic verification.		☐ The following issues related to the initial verification have to be addressed:		
C. Description of the monitoring system				
C.1. Management System ***(EB 55 Annex 1, § 184 a (iii))*** *Check if the GHG data monitoring system can be assessed as appropriate.* *In case reference is made to a (certified) company quality management system, check if all CDM related monitoring procedures have been fully integrated in the project participant's quality management system.* *In case of a stand-alone system, check how the GHG management system has been implemented and effectiveness is ensured.*	/MR/ /IM01/ /IM02/ /MM/	*Description:* All applicable procedures within the GHG monitoring system have been summarized in a CDM monitoring manual and relevant QA/QC procedures. This manual addressed procedures for measurements, collection and compilation of data, data storage and archiving, calibration, maintenance and training of personnel. *Justification of evidences:* The monitoring manual was assessed by the verification team to ensure the GHG management to be implemented. Furthermore an experienced CDM consulting company has been contracted by the PP in order to heighten the quality monitoring process. *Conclusion:* The GHG monitoring system has been implemented appropriately.	OK	OK
C.2. Metering diagram ***(EB 54 Annex 34, C)*** *Check first if the MR includes a metering diagram showing all relevant monitoring points..* *Check further if this diagram reflects the actual situation and is in line with the registered PDD and with the requirements of the applied methodology.*	/MR/ /IM01/ /AM29/	*Description:* The connection diagram including the monitoring points and monitoring equipments were involved in the MR. *Justification of evidences:* The connection diagram was checked to be consistent with the one presented on the screen of the plant´s central control room. *Conclusion:* A monitoring diagram with monitoring point and equipments was addressed in MR and is in line with the registered PDD and	OK	OK

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		requirements of the methodology.		
C.3. Roles and Responsibilities ***(EB 54 Annex 34, C)*** *Check if all roles and positions of each person in the GHG data management process are clearly defined and implemented as stated in the monitoring plan. Please consider the complete data trail from raw data generation to submission of the final data.* *Identify, if relevant personnel w.r.t. monitoring has been exchanged?* *If so, have appropriate training measures been carried out.* *In case of changes, assure that the implemented monitoring procedures have not been affected.*	/IM01/ /MM/	*Description:* Responsibilities for measurements, collection and compilation of data, data storage and archiving, calibration, maintenance and training of personnel have been introduced. *Justification of evidences:* The certificates of the appointed person have been checked. *Conclusion:* All appointed person involved are duly qualified for the task assigned. The roles and positions of each person have been clearly defined and implemented.	OK	OK
C.4. Emergency procedures for the monitor-ring system ***(EB 54 Annex 34, C)*** *Check, as appropriate, whether relevant emergency procedures for the monitoring system have been included in the MR and assess whether these procedures have been implemented, when required*		*Description:* The emergency procedures was clearly addressed in MR and assessed as appropriate for implementation. If the gateway meter No.1 is in malfunction, the reading of its backup meter No.2 installed at 500kV Chaya substation will be applied for settlement and emission reduction calculation. *Justification of evidences:* The emergency & trouble solving procedure were checked to be reliable. *Conclusion:* An emergency procedure was established and assessed as appropriate for implementation.	OK	OK
C.5. Data archive and data protection	/QA/	*Description:* All relevant monitoring data was available and	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
Check whether all records of monitoring parameters are archived according to the monitoring plan. Assess further whether appropriate measures have been taken in order to avoid unintended or intended manipulation or loss of the measured data.	/IM01/	procedures are in place so that relevant monitoring data will be retained at least 2 years after the end of the crediting period. The danger of unintended or intended data manipulation can be considered as low, since: 1. The meters were verified and sealed by the grid company/gas company, the measured data will be cross checked by the monthly sales receipts. *2.* On-line monitoring system retrieves data from the meters to the data assembly point and recorded every one hour by the electricity generating department. *3.* All data stored on-site are archived in forms of hardcopy and softcopy. The electricity generating dept/gas supplier is responsible for records control. The corresponding Digital Control System work within limitation of user authorization. *Justification of evidences:* The record of the monitoring data and the hard & soft copy has been checked. *Conclusion:* The data is assessed to be appropriate. All data has been archived according to monitoring plan. The measures taken by the project owner and grid company/gas supplier could ensure the data well to be protected and frozen.		
D. Data and parameters monitored				
D.1. $FC_{NG,y}$		**Description:** Quantity of natural gas consumed in project activity.		

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
a) Measurement / Determination method ***(EB 55 Annex 1, §§ 184-185, 202-203)*** *Describe how the monitoring parameter was measured / determined.* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/IM01/ /PDD/ /AM29/	*Description:* $FC_{NG,y}$ is determined as annual quantity of natural gas consumed by the project activity. It was measured continuously by the Gas Flow Meter 1# and its backup meter 2# with accuracy of 1.0. The reading was recorded hourly and summarized daily. The meters are installed in front of the natural gas delivery point at the gas supplier side. No meters exchange and malfunction were observed during this monitoring period. No meters exchanges and malfunction were detected during the monitoring period. *Justification of evidences:* The daily and monthly meter reading record have been checked and cross checked by the monthly gas purchase invoice. The meters have been viewed and cross checked with the calibration record. *Conclusion:* The characteristic of the meters including serial no. type and accuracy of the meter are consistent with those described in registered Monitoring Plan. No failures/downtimes of standard equipment were observed during this monitoring period, thus no deviant measurement /determination method is in line with the registered monitoring plan and applied methodology.	OK	OK
b) Accuracy ***(EB 55 Annex 1, §§ 205c, 206a)*** *In case of measured (or estimated) values, check*	/CAL/ /MM/	*Description:* The natural gas consumed in the project is measured by the Gas Flow meter 1# and 2# continuously with accuracy 1.0 and	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.		recorded hourly. The two meters were calibrated yearly by a qualified independent third party Henan Institute of Metrology and Testing and in line with the industry requirement. *Justification of evidences:* The accuracy of gas flow meter 1# and 2# is 1.0 and meets the applied national standard (GB/T 18603-2001). The measured value was crosschecked by the monthly NG purchase invoice. The calibration records covering the monitoring period were checked at the time of on-site verification. *Conclusion:* All meters are in normal operational condition during this monitoring period. No inaccuracies and malfunction occurred during the monitoring period.		
c) QA/QC Procedure ***(EB 55 Annex 1, §§ 184b (vii), 205c, 206)*** *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.*	/CAL/ /MM/	*Description:* The accuracy of Gas Flow Meter 1# and 2# is 1.0 and meets the requirement of the applied national standard. Backup ultrasonic gas meter 3#, 4#, 4# and 6# were installed at the project site for cross check in case of Meter 1# and 2# both failures. The ultrasonic gas flow meter 3#, 4#, 5# and 6# were also installed in the front of the gas inlet in the project site, which are fully in line with PDD. All the meters were calibration yearly by a qualified third party *Justification of evidences:* The calibration records covering this monitoring period have been checked during the verification. The qualification certificate of the calibration entity was verified.	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
		Conclusion: All the meters are in normal operational condition during this monitoring period. No error has occurred. QA/QC procedures for the meters are in line with the MP and the calibration and maintenance of the monitoring equipment have been carried out appropriately.		
d) Correctness ***(EB 55 Annex 1, §§ 202, 206, 221e)*** *Determine whether the value given in the monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/MR/ /MMR/ /XLS/	☒ Correct ☐ Not correct *Description:* 151,288,576 Nm³ natural gas has been consumed by the project measured by Gas Flow Meter 1# and 2# from December 2010 to March 2011. *Justification of evidences:* The daily and monthly meter reading records were checked and compared with natural gas purchase invoices and records of backup meter 2#. Monthly Natural Gas consumption confirmation sheet provided by China Petroleum West-East Gas Transfer Pipeline Company was crosschecked with the gas purchase invoice. *Conclusion:* The value of natural gas consumption applied in emission reduction calculation is correct.	OK	OK
D.2. $NCV_{NG,y}$		**Description:** Net calorific value of the NG.		
a) Measurement / Determination method ***(EB 55 Annex 1, §§ 184-185, 202-203)*** *Describe how the monitoring parameter was*	/IM01/ /PDD/ /AM29/	*Description:* The NCV of the natural gas is determined from the results of a gas chromatograph (GC) measurement upstream of the plant.	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
measured / determined. *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*		The value is measured by the gas supplier (Petro China) and the NVC values were recorded every ten days by the gas supplier. The manufacturer of the gas chromatograph analyzer is ABB, type BTU-8000. This analyzer is operated on a continuous basis. No device exchange and malfunction were detected during the monitoring period. *Justification of evidences:* The accuracy of the analyzer was checked against the calibration report. The characteristics including measuring conditions and accuracy of the meter are consistent with those described in validated MP. *Conclusion:* No failures/downtimes of standard equipment were observed during this monitoring period, thus no deviant measurement /determination methods were applied. The measurement method is in line with the registered monitoring plan and applied methodology.		
b) Accuracy ***(EB 55 Annex 1, §§ 205c, 206a)*** *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.*	/CAL/ /MM/	*Description:* The NCV value was measured by GC continuously. The GC calibrations were performed yearly by a qualified third party and they are in line with the industry requirement. *Justification of evidences:* The accuracy of GC met with the applied national standard (GB/T13610-2003). The GC calibration records covering the monitoring period were available during the onsite visit and have been checked.	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
		Conclusion: No significant inaccuracies have been identified for this parameter.		
c) QA/QC Procedure ***(EB 55 Annex 1, §§ 184b (vii), 205c, 206)*** *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.*	/CAL/ /MM/	*Description:* The QA/QC procedure is in line with the requirements of the PDD, AM0029 and the applied national standard. The GC is calibrated yearly by the qualified third party. *Justification of evidences:* The GC calibration records covering this monitoring period have been checked during the verification. The qualification certificate of the calibration entity was verified. *Conclusion:* The GC is in normal operational condition during this monitoring period. No error has occurred. QA/QC procedures for the meters are in line with the MP and the calibration and maintenance of the monitoring equipment have been carried out appropriately.	OK	OK
d) Correctness ***(EB 55 Annex 1, §§ 202, 206, 221e)*** *Determine whether the value given in the monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.*	/MR/ /MMR/ /XLS/	☒ Correct ☐ Not correct *Description:* The weighted average NCV during this MP is 34.18 MJ/Nm³. . *Justification of evidences:* The every ten days NVC reading records provided by the gas supplied has been reviewed. The MR and Emission Reduction Spreadsheet have been checked. *Conclusion:* The value of weighted average NVC applied in emission	OK	OK

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.		reduction calculation is correct.		
D.3. $OXID_i$		**Description:** Oxidation factor for the fuel i.		
a) Measurement / Determination method ***(EB 55 Annex 1, §§ 184-185, 202-203)*** *Describe how the monitoring parameter was measured / determined.* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/IM01/ /PDD/ /AM29/	*Description:* The oxidation factor has been derived from the latest IPCC publication. *Justification of evidences:* The latest 2006 IPCC values have been checked. *Conclusion:* The determination method is in line with the registered monitoring plan of the PDD and the applied methodology.	OK	OK
b) Accuracy ***(EB 55 Annex 1, §§ 205c, 206a)*** *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.*	/IPCC/ /MM/	*Description:* The natural gas oxidation factor has been derived from the latest IPCC publication. *Justification of evidences:* The latest 2006 IPCC values have been checked. *Conclusion:* The value is correct.	OK	OK
c) QA/QC Procedure	/CAL/	*Description:*	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
(EB 55 Annex 1, §§ 184b (vii), 205c, 206) *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.*	/MM/	The natural gas oxidation factor has to be derived from the latest IPCC publication. *Justification of evidences:* The MP has been checked. *Conclusion:* No further QA/QC procedure is requested.		
d) Correctness ***(EB 55 Annex 1, §§ 202, 206, 221e)*** *Determine whether the value given in the monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/MR/ /MMR/ /XLS/	☒ Correct ☐ Not correct *Description:* The 2006 IPCC default value for $OXID_{NG}$ is 1.0. *Justification of evidences:* The latest 2006 IPCC value have been checked though the IPCC official website. *Conclusion:* The value of weighted average NVC of natural gas applied in emission reduction calculation is correct.	OK	OK
D.4. $EF_{CO2,NG,y}$		**Description:** Emission factor for NG consumed in the project activity.		
a) Measurement / Determination method ***(EB 55 Annex 1, §§ 184-185, 202-203)*** *Describe how the monitoring parameter was measured / determined.* *Check if relevant equipment has been exchanged*	/IM01/ /PDD/ /AM29/ /LGS/	*Description:* The value determined by national data which is cited from 2006 IPCC. *Justification of evidences:* Acc. to the letter/LGS/ from the gas supplier the gas composition	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*		data is not available for this monitoring period. The latest 2006 IPCC values have been checked. *Conclusion:* The determination method is in line with the registered monitoring plan of the PDD and the applied methodology.		
b) Accuracy ***(EB 55 Annex 1, §§ 205c, 206a)*** *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.*	/IPCC/ /MM/	*Description:* The natural gas emission factor has been derived from the latest IPCC publication. *Justification of evidences:* The latest 2006 IPCC values have been checked. *Conclusion:* The value is correct.	OK	OK
c) QA/QC Procedure ***(EB 55 Annex 1, §§ 184b (vii), 205c, 206)*** *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.*	/CAL/ /MM/ /PDD/ /AM29/	*Description:* Not required as per the methodology. *Justification of evidences:* The MP and methodology have been checked. *Conclusion:* No further QA/QC procedure is requested.	OK	OK
d) Correctness ***(EB 55 Annex 1, §§ 202, 206, 221e)***	/MR/ /MMR/ /XLS/	☒ Correct ☐ Not correct *Description:*	~~CAR D1~~	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
Determine whether the value given in the monitoring report is correct or determined in a conservative manner. *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*		The 2006 IPCC default value for $EF_{CO2,NG,y}$ (15.3 tC/GJ = 0.0561 tCO_2/GJ) was used. *Justification of evidences:* The latest 2006 IPCC value has been checked though the IPCC official website. *Conclusion:* CAR D1 was raised.		
D.5. $COEF_{NG,y}$		**Description:** CO_2 emission coefficient in year y for natural gas		
a) Measurement / Determination method ***(EB 55 Annex 1, §§ 184-185, 202-203)*** *Describe how the monitoring parameter was measured / determined.* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/IM01/ /PDD/ /AM29/	*Description:* $COEF_{NG,y}=NCV_{NG,y}\times EF_{CO2,NG,y}\times OXID_{NG}$. The coefficient is calculated based on net calorific value, CO_2 emission factor and oxidation. *Justification of evidences:* The methodology and the registered PDD have been checked to confirm the correctness. *Conclusion:* The measurement/determination method is in line with the registered monitoring plan of the PDD and the applied methodology.	OK	OK
b) Accuracy ***(EB 55 Annex 1, §§ 205c, 206a)*** *In case of measured (or estimated) values, check*	/IPCC/ /MM/	*Description:* The value is calculated. *Justification of evidences:*	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.		The methodology and the registered PDD have been checked. *Conclusion:* The value is correctly calculated.		
c) QA/QC Procedure ***(EB 55 Annex 1, §§ 184b (vii), 205c, 206)*** *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.*	/CAL/ /MM/	*Description:* Not required as per the methodology. *Justification of evidences:* The MP and methodology have been checked. *Conclusion:* No further QA/QC procedure is requested.	OK	OK
d) Correctness ***(EB 55 Annex 1, §§ 202, 206, 221e)*** *Determine whether the value given in the monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/MR/ /MMR/ /XLS/	☒ Correct ☐ Not correct *Description:* The parameters applied for the calculation were verified in the above tables, which are assessed as correct. *Justification of evidences:* The latest 2006 IPCC values have been checked though the IPCC official website. The NCV reading records provided by the gas supplier were checked. The value given in the monitoring report and the corresponding Excel sheet were checked. *Conclusion:* The value given in the monitoring report and ER-calculation is correct.	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
D.6. PE_y		**Description:** CO_2 emissions from the power plant of the project due to combustion of natural gas fuel in y year		
a) Measurement / Determination method ***(EB 55 Annex 1, §§ 184-185, 202-203)*** *Describe how the monitoring parameter was measured / determined.* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/IM01/ /PDD/ /AM29/	*Description:* $PE_y=FC_{NG,Y}\times COEF_{NG,y}$ $COEF_{NG,y}=NCV_{NG,y}\times EF_{CO2,NG,y}\times OXID_{NG}$. The project emission is total volume of natural gas consumed multiplied the coefficient of natural gas. *Justification of evidences:* The methodology and the registered PDD have been checked to confirm the correctness. *Conclusion:* .The measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.	OK	OK
b) Accuracy ***(EB 55 Annex 1, §§ 205c, 206a)*** *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.*	/CAL/ /MM/	*Description:* The parameter is calculated *Justification of evidences:* The MP has been checked. *Conclusion:* The calculated value is correct.	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
c) QA/QC Procedure ***(EB 55 Annex 1, §§ 184b (vii), 205c, 206)*** *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.*	/CAL/ /MM/	*Description:* As per the methodology QA/QC procedures are not necessary. *Justification of evidences:* The methodology and the MP has been checked. *Conclusion:* No further QA/QC procedure is requested.	OK	OK
d) Correctness ***(EB 55 Annex 1, §§ 202, 206, 221e)*** *Determine whether the value given in the monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/MR/ /MMR/ /XLS/	☒ Correct ☐ Not correct *Description:* .290,133.031 tCO_{2e} have been emitted from the power plant of the project due to combustion of natural gas fuel. *Justification of evidences:* The gas consumption and NCV have been checked through the record data. The NCV reading records provided by the gas supplier were checked. The value given in the monitoring report and the corresponding Excel sheet were checked. *Conclusion:* The value given in the monitoring report and emission reduction calculation spreadsheet is correct.	OK	OK
D.7. $EG_{net,pj,y}$		**Description:** The actual annual net electricity delivered by the project activity.		
a) Measurement / Determination method ***(EB 55 Annex 1, §§ 184-185, 202-203)*** *Describe how the monitoring parameter was*	/IM01/ /PDD/ /AM29/	*Description:* Three meters are involved in metering of the electricity exported to the grid and imported from the grid. The gateway meter No1	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
measured / determined. *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*		and its backup meter No.2 are located at 500kV Chaya substation. In case the meter No.1 is detected in fault, the backup meter No.2 will apply for billing. During this monitoring period, there is no malfunction detected. Neither the meters have been exchanged. Meter No.3 is located at the project site on 110kV line, which is used to measure the amount of electricity imported from grid in case the electricity is need for starting up the power units. The actual annual net electricity delivered to the grid will be calculated as following: $EG_{net,pj,y} = EG_{export,M1} - EG_{import,M1} - EG_{import,M3}$ *Justification of evidences:* The daily and monthly meter reading records were checked by the verification team and cross checked by the electricity purchase and sales invoices. *Conclusion:* The measurement/determination method of net electricity generation is in line with the registered monitoring plan of the PDD and the applied methodology.		
b) Accuracy ***(EB 55 Annex 1, §§ 205c, 206a)*** *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have*	/IPCC/ /MM/	*Description:* The exported and imported electricity were measured by Meter No.1, Meter No.2 and Meter No.3 continuously with accuracy 0.2S and recorded monthly. All the main meters and the backup meters calibrations were performed quarterly by a qualified third party and in line with the industry requirement.	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
been made for calculating ERs.		*Justification of evidences:* The accuracy of meter No.1 and No.2 and No.3 is 0.2S meet the applied national standard (DL/T448-2000). The measured value was crosschecked by the monthly power sales and purchase invoices. The meters calibration records covering the monitoring period were available during the onsite verification and have been checked. *Conclusion:* All the meters are in normal operational condition during this monitoring period. No inaccuracies occurred during the monitoring period for Meter No.1 , No.2 and No.3.		
c) QA/QC Procedure ***(EB 55 Annex 1, §§ 184b (vii), 205c, 206)*** *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.*	/CAL/ /MM/	*Description:* Meter No.1, Meter No.2 and Meter No.3 calibrations were performed quarterly by a qualified third party and in line with the industry requirement. *Justification of evidences:* The meters calibration records regarding the main meter and the backup meter covering the monitoring period were available during the onsite verification and have been checked. The qualification certificate of calibration entity was verified. *Conclusion:* All the meters are in normal operational condition during this monitoring period. No error has occurred. QA/QC procedures for Meter No.1, Meter No.2 and Meter No.3 are in line with the MP and the calibration and maintenance of the monitoring equipment have been carried out appropriately.	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
d) Correctness ***(EB 55 Annex 1, §§ 202, 206, 221e)*** *Determine whether the value given in the monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/MR/ /MMR/ /XLS/	☒ Correct ☐ Not correct *Description:* 759,359.97 MWh net electricity has been generated during this MP. *Justification of evidences:* The daily and monthly meter reading records were checked and compared with the electricity invoices and power balance sheet which were approved by grid company. *Conclusion:* The value applied for ER calculation is correct.	OK	OK
D.8. $EF_{grid,BM,y}$		**Description:** Built margin emission factor of CCPG during the project operation period.		
a) Measurement / Determination method ***(EB 55 Annex 1, §§ 184-185, 202-203)*** *Describe how the monitoring parameter was measured / determined.* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/IM01/ /PDD/ /AM29/	*Description:* As per the PDD, $EF_{grid,BM,y}$ is selected as the baseline emission factor, which has been determined ex post. For the verification, the latest value available at DNA website at the time of verification is applied. *Justification of evidences:* The latest value available at the NDRC website (2010 Baseline Emission Factors for Regional Power Grids in China issued by National Development and Reform Commission on 2010-12-20) has been checked. *Conclusion:* The determination method is assessed as correct.	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
b) Accuracy ***(EB 55 Annex 1, §§ 205c, 206a)*** *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.*	/IPCC/ /MM/	*Description:* The latest Built margin emission factor of CCPG available on the DNA-website has been used. *Justification of evidences:* The latest value available at the NDRC website (2010 Baseline Emission Factors for Regional Power Grids in China issued by National Development and Reform Commission on 2010-12-20) has been checked. *Conclusion:* The value is correct.	OK	OK
c) QA/QC Procedure ***(EB 55 Annex 1, §§ 184b (vii), 205c, 206)*** *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.*	/CAL/ /MM/ /PDD/ /AM29/	*Description:* The latest Built margin emission factor of CCPG available on the DNA-website has been used. *Justification of evidences:* The methodology and the MP have been checked. *Conclusion:* No further QA/QC procedure is requested.	OK	OK
d) Correctness ***(EB 55 Annex 1, §§ 202, 206, 221e)*** *Determine whether the value given in the monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment*	/MR/ /MMR/ /XLS/	☒ Correct ☐ Not correct *Description:* The latest Built margin emission factor of CCPG is 0.4543tCO_{2e}/MWh. *Justification of evidences:* The latest value available on NDRC website has been checked.	OK	OK

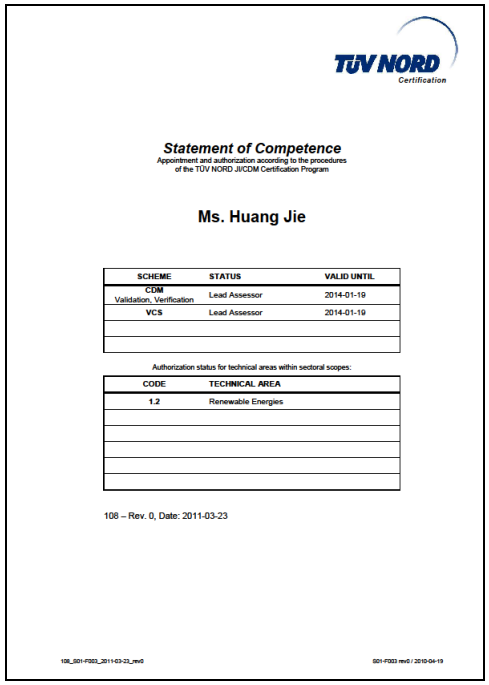
Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
of the conservativeness of the approach used should be given. *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*		*Conclusion:* The value given in the monitoring report is correct.		
E. Emission reductions calculation				
E.1. Traceability ***(EB 55 Annex 1, § 182)*** *Assess if the calculation is fully traceable. In case of complex calculations an Excel calculation spread-sheet shall be used. All applied formulae must be visible.*	/XLS/	*Description:* An unprotected excel calculation sheet has been provided. *Justification of evidences:* The calculation spreadsheet has been checked. *Conclusion:* All applied formulae are visible.	OK	OK
E.2. Parameter consistency ***(EB 55 Annex 1, § 186; EB 54 Annex 34 Pt.1)*** *Assess whether all internal and external parameters and data used for calculation are applied consistently in the monitoring report and the calculation spreadsheet?* *Consider only the correct data exchange between the monitoring report and the calculation spreadsheet (if any). Further ensure the consistency of notations for all parameters in the PDD, MR, calculation spreadsheet.*	/XLS/ /PDD/ /MR/	*Description:* All the internal and external parameters and data used for calculation are applied consistently in the monitoring report and the calculation spreadsheet. *Justification of evidences:* The excel-calculation sheet has been checked against the MR and the PDD. *Conclusion:* The excel-calculation sheet is completely in line with the MR. No deviant values have been used in the calculation sheet.	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
E.3. Parameter presentation ***(EB 54 Annex 34 Pt.1)*** *Check if all values included in the MR are presented as per international standards* • *Format: Standard format (e.g. 1,000 representing one thousand and 1.0 representing one).* • *Units: Values shall be directly given in SI units – or additionally to original units transferred to SI.* • *Short scale naming system: (Only) million = 10^6 and billion 10^9 shall be used.*	/XLS/ /PDD/ /AM0029/	*Description:* All data is presented in international applicable standard formats, SI units and short scale naming system. *Justification of evidences:* The excel-calculation sheet has been checked. *Conclusion:* The monitoring report has been checked and it is confirmed that	OK	OK
E.4. Correctness of calculation ***(EB 55 Annex 1, §§ 204-206)*** *Check if the applied formulae and methods for calculating baseline emissions, project emissions and leakage are in accordance with the monitoring plan and / or the approved methodology.* *Assess whether the provided calculations are complete and reflect all requirements of the monitoring plan.* *Check especially that no standard or old values have been used for calculation where calculations based on up-to-date data is required.*	/XLS/ /MR/ /PDD/	*Description:* According to AM0029 Ver.03, emission reduction is calculated as: $ER_y=BE_y-PE_y-LE_y$ Where: BE_y is the baseline emission during year y. PE_y is the project emission during year y. LE_y is the leakage of the project during year y. Baseline Emissions: $BE_y=EG_{pj,y}\times EF_{grid,CO2,y}$ Project Emissions: $PE_y=FC_{NG,y}\times COEF_{NG,y}$ $COEF_{NG,y}=NCV_{NG,y}\times EF_{CO2,NG,y}\times OXID_{NG}$ Leakage:	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
		$LE_y = LE_{CH4,y} = [FC_y \times NCV_{NG,y} \times EF_{NG,upstream,CH4} - EG_{pj,y} \times EF_{BL,upstream,CH4}] \times GWP_{CH4}$ *Justification of evidences:* The MR, MP of the project, ER spreadsheet and the methodology AM0029 ver.03 were checked. *Conclusion:* All the applied formulae are in accordance with the monitoring plan and the approved methodology.		
E.5. Emission reductions table ***(EB 54 Annex 34, E.4)*** *Check if the MR includes a summary table of the emission reductions calculation specifiying separately* • *Total baseline emissions* • *Total project emissions:* • *Total leakage* • *Total emission reductions.* *Assess whether the values are correct or need to be revised as a consequence of issues identified above.*		☒ The MR includes in section E.4 a summary table of the emission reductions calculation. ☒ The summary table specified the total baseline, project and leakage emissions as well as the total emission reductions separately. ☒ The values as specified in the ER summary table are correct; no issues have been identified during the verification which require changes in the ER calculation. ☐ During the verification issues with impact on the ER calculation have been identified. Thus subject to the closure of above listed findings the summary table in E.4 needs to be revised.	OK	OK
E.6. Comparison with ex-ante determined emission reductions ***(EB 54 Annex 34, E.5; E.6)*** *Check if the MR includes a comparison of actual values of the monitoring period with the estimations in*	/XLS/ /MR/ /PDD/	*Description:* During the monitoring period (from 2010-12-01 to 2011-03-01) the actual ER of the project is 54,881, which is lower than the estimate as per the registered PDD. Meanwhile, the PLF during this monitoring period is lower than the value of 39.1% in indicated in the registered PDD.	~~CAR E1~~	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
the registered PDD. *Check further whether in case of an increase an appropriate explanation is included in the MR.* *Assess in case of a significant increase whether this is due to technical or organisational changes within or outside the control of the PP which might require a notification / approval of changes (as per EB 48 Annex 66/67).*		*Justification of evidences:* The emission reduction calculation has been checked which is assessed as correct. The registered PDD has been crosschecked. *Conclusion:* A comparison of actual ER achieved during the monitoring period with the estimation in the registered PDD has been presented in the MR: Nevertheless CAR E1 was raised.		

ANNEX 2: STATEMENTS OF COMPETENCE OF ALL INVOLVED PERSONNEL



TÜV NORD Certification

Statement of Competence

Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program

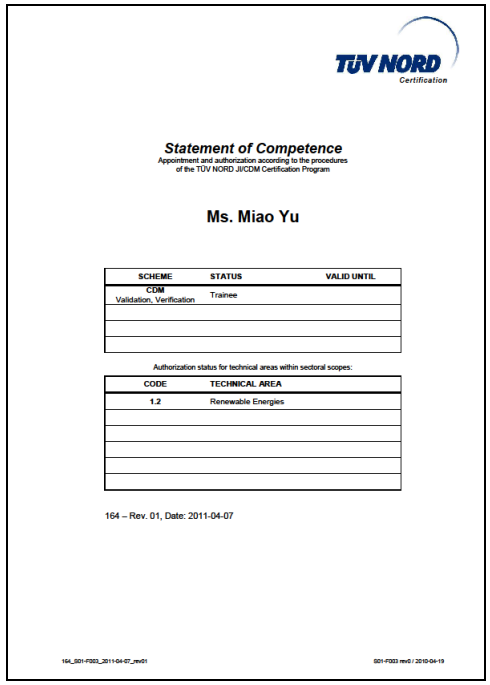
Ms. Huang Jie

SCHEME	STATUS	VALID UNTIL
CDM Validation, Verification	Lead Assessor	2014-01-19
VCS	Lead Assessor	2014-01-19

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewable Energies

108 – Rev. 0, Date: 2011-03-23



TÜV NORD Certification

Statement of Competence

Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program

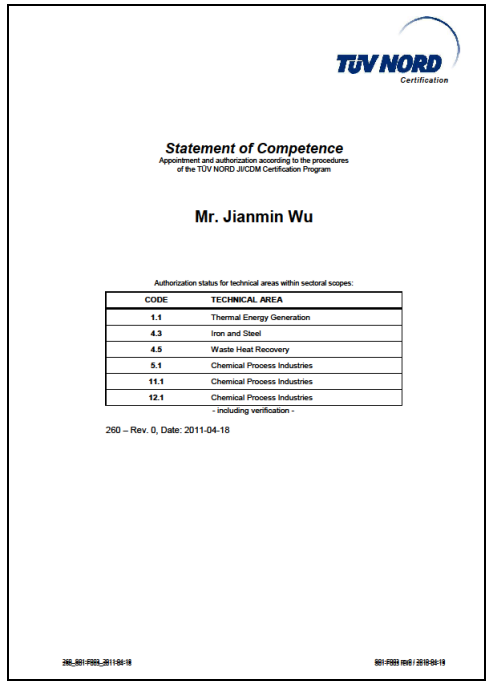
Ms. Miao Yu

SCHEME	STATUS	VALID UNTIL
CDM Validation, Verification	Trainee	

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewable Energies

164 – Rev. 01, Date: 2011-04-07



TÜV NORD Certification

Statement of Competence

Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program

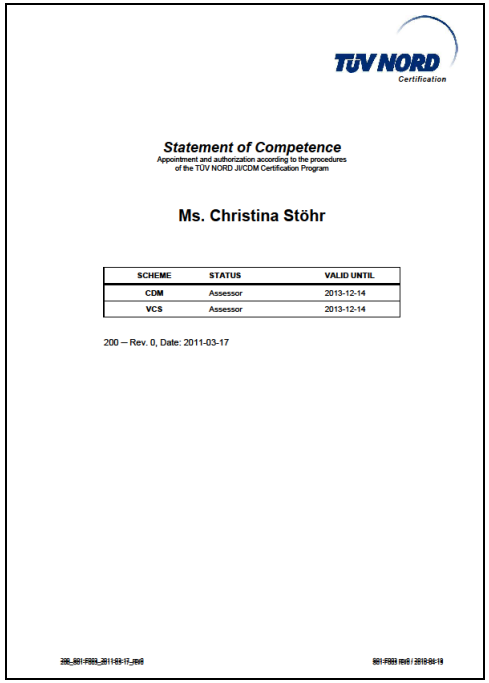
Mr. Jianmin Wu

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.1	Thermal Energy Generation
4.3	Iron and Steel
4.5	Waste Heat Recovery
5.1	Chemical Process Industries
11.1	Chemical Process Industries
12.1	Chemical Process Industries

- including verification -

260 – Rev. 0, Date: 2011-04-18



TÜV NORD Certification

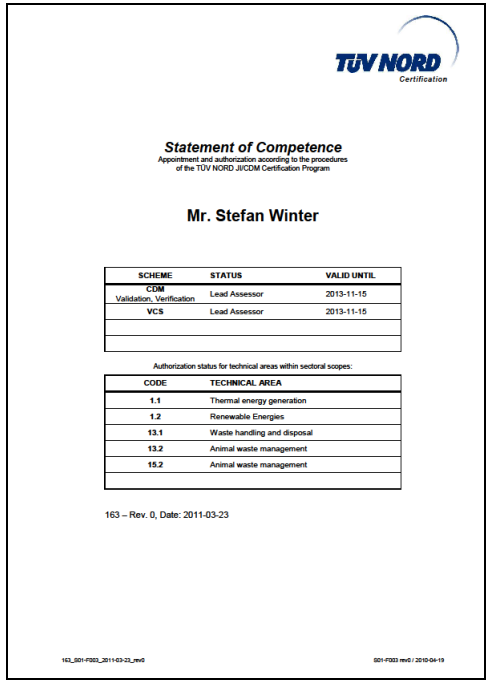
Statement of Competence

Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program

Ms. Christina Stöhr

SCHEME	STATUS	VALID UNTIL
CDM	Assessor	2013-12-14
VCS	Assessor	2013-12-14

200 – Rev. 0, Date: 2011-03-17



TÜV NORD Certification

Statement of Competence

Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program

Mr. Stefan Winter

SCHEME	STATUS	VALID UNTIL
CDM Validation, Verification	Lead Assessor	2013-11-15
VCS	Lead Assessor	2013-11-15

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.1	Thermal energy generation
1.2	Renewable Energies
13.1	Waste handling and disposal
13.2	Animal waste management
15.2	Animal waste management

163 – Rev. 0, Date: 2011-03-23