



# VERIFICATION REPORT

- 1<sup>ST</sup> PERIODIC –

## CARBON ASSET MANAGEMENT SWEDEN AB

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

UNFCCC REF. No. : 2344

Monitoring Period: 2009-08-25 to 2010-02-28  
(incl. both days)

**Report No: 8000380818 – 10/41 V01**

**Date: 2010-06-07**

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<b>Verification Report:</b>	<b>Report No.</b>	<b>Rev. No.</b>	<b>Date of 1<sup>st</sup> issue:</b>	<b>Date of this rev.</b>
	8000380818 – 10/41 V01	0	2010-06-07	2010-06-07
<b>Project:</b>	<b>Title:</b>	<b>Registration date:</b>		<b>UNFCCC-No.:</b>
	Zhumadian Zhongyuan Gas-Steam Combined Cycle Power Project in Henan China	2009-08-25		<a href="#">2344</a>
<b>Project Participant(s):</b>	<b>Host party:</b>	<b>Other involved parties:</b>		
	China	Sweden		
<b>Applied methodology/ies:</b>	<b>Title:</b>	<b>No.:</b>	<b>Scope:</b>	
	Baseline Methodology for Grid Connected Electricity Generation Plants using Natural Gas	AM0029 ver. 3	1	
<b>Monitoring:</b>	<b>Monitoring period (MP):</b>	<b>No. of days:</b>	<b>MP No.</b>	
	2009-08-25 to 2010-02-28 - both days included	188	1	
<b>Monitoring report:</b>	<b>Title:</b>	<b>Draft version:</b>	<b>Final version:</b>	
	CER Monitoring Report - Zhumadian Zhongyuan Gas-Steam Combined Cycle Power Project in Henan China	2010-03-04	2010-05-25	
<b>Verification team / Technical Review and Final Approval</b>	<b>Verification Team:</b>	<b>Technical review:</b>	<b>Final approval:</b>	
	Li, Yongjun      Yan, Tao      Yu, Miao Stefan Winter	Rainer Winter, Martin Saalmann	Martin Saalmann	
<b>Emission reductions: [t CO<sub>2e</sub>]</b>	<b>Verified amount</b>	<b>As per draft MR:</b>	<b>As per PDD:</b>	
	140,461t	143,297 t	858,165 t /a	
<b>Summary of Verification Opinion:</b>	<p>Carbon Asset Management Sweden AB has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 1<sup>st</sup> 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 reduces GHG emissions due to electricity generation by utilizing of available natural gas. This verification covers the period from 2009-08-25 to 2010-02-28 (including both days).</p> <p>In the course of the verification 7 Corrective Action Requests (CAR) and 6 Clarification Requests (CL) were raised and successfully closed. Furthermore 1 FAR is 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.</p> <p>As a result of this verification, the verifier confirms that:</p> <ul style="list-style-type: none"><li>• All operations of the project are implemented and installed as planned and described in the validated project design document.</li><li>• The monitoring plan is in accordance with the applied approved CDM methodology ,i.e., AM0029 ver. 3</li><li>• The installed equipment essential for measuring parameters required for calculating emission reductions are calibrated appropriately.</li><li>• The monitoring system is in place and functional. The project has generated GHG emission reductions.</li></ul> <p>As the result of the 1<sup>st</sup> 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:</p> <p>Emission reductions:                      140,461                      t CO<sub>2e</sub></p>			
<b>Document information:</b>	<b>Filename:</b>			<b>No. of pages:</b>
	2010-06-07 VerR_Zhongyun NGCC			92

## **Abbreviations:**

<b>CA</b>	<b>Corrective Action / Clarification Action</b>
<b>CAR</b>	<b>Corrective Action Request</b>
<b>CCPG</b>	<b>Central China Power Grid</b>
<b>CDM</b>	<b>Clean Development Mechanism</b>
<b>CER</b>	<b>Certified Emission Reduction</b>
<b>CO<sub>2</sub></b>	<b>Carbon dioxide</b>
<b>CO<sub>2eq</sub></b>	<b>Carbon dioxide equivalent</b>
<b>CL</b>	<b>Clarification Request</b>
<b>ER</b>	<b>Emission Reduction</b>
<b>GC</b>	<b>Gas Chromatography Analyzer</b>
<b>FAR</b>	<b>Forward Action Request</b>
<b>GHG</b>	<b>Greenhouse gas(es)</b>
<b>MP</b>	<b>Monitoring Plan</b>
<b>MR</b>	<b>Monitoring Report</b>
<b>NG</b>	<b>Natural Gas</b>
<b>NGCC</b>	<b>Natural Gas fired Combined-Cycle</b>
<b>PDD</b>	<b>Project Design Document</b>
<b>PLF</b>	<b>Plant Load Factor</b>
<b>PP</b>	<b>Project Participant</b>
<b>QA/QC</b>	<b>Quality Assurance / Quality Control</b>
<b>UNFCCC</b>	<b>United Nations Framework Convention on Climate Change</b>
<b>XLS</b>	<b>Emission Reduction Calculation Spread Sheet</b>

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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 1<sup>st</sup> 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<sup>1</sup>.

GHG data for the monitoring period covering 2009-08-25 to 2010-02-28 was verified in detailed manner applying the set of requirements, audit practices and principles as required under the Validation and Verification Manual <sup>/VVM/</sup> of the UNFCCC.

This report summarizes the findings and conclusions of this 1<sup>st</sup> 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 <sup>/PDD/</sup>, the monitoring report <sup>/MR/</sup>, emission reduction calculation spread sheet <sup>/XLS/</sup>, 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:

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<sup>1</sup> <http://cdm.unfccc.int/Projects/DB/TUEV-SUED1229357612.62/view>



- Article 12 of the Kyoto Protocol <sup>/KP/</sup>,
- guidelines for the implementation of Article 12 of the Kyoto Protocol as presented in the Marrakech Accords under decision 3/CMP.1 <sup>/MA/</sup>, and subsequent decisions made by the Executive Board and COP/MOP,
- other relevant rules, including the host country legislation,
- CDM Validation and Verification Manual <sup>/VVM/</sup>,
- monitoring plan as given in the registered PDD <sup>/PDD/</sup>,
- Approved CDM Methodology AM0029 ver.3: 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	<input checked="" type="checkbox"/> Large Scale	<input type="checkbox"/> Small Scale	
Project Scope (according to UNFCCC sectoral scope numbers for CDM)	<input checked="" type="checkbox"/>	1	Energy Industries (renewable- /non-renewable sources)
	<input type="checkbox"/>	2	Energy distribution
	<input type="checkbox"/>	3	Energy demand
	<input type="checkbox"/>	4	Manufacturing industries
	<input type="checkbox"/>	5	Chemical industry
	<input type="checkbox"/>	6	Construction
	<input type="checkbox"/>	7	Transport
	<input type="checkbox"/>	8	Mining/Mineral production
	<input type="checkbox"/>	9	Metal production
	<input type="checkbox"/>	10	Fugitive emissions from fuels (solid, oil and gas)
	<input type="checkbox"/>	11	Fugitive emissions from production and consumption of halocarbons and hexafluoride
	<input type="checkbox"/>	12	Solvents use
	<input type="checkbox"/>	13	Waste handling and disposal
	<input type="checkbox"/>	14	Afforestation and Reforestation
	<input type="checkbox"/>	15	Agriculture
Applied Methodology	AM0029 ver.3		
Technical Area(s)	G: Energy Industry		
CDM registration No.	2344		
Crediting period	<input checked="" type="checkbox"/>	Renewable Crediting Period (7 y)	
	<input type="checkbox"/>	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	Start of crediting period	2009-08-25	-
3	1 <sup>st</sup> Monitoring period	2009-08-25 to 2010-02-28	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	China	Huaneng Zhongyuan Gas Power Company Ltd.
Other involved party/ies	Sweden	Carbon Asset Management Sweden AB

## 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:	China
Region:	Henan Province
Project location address:	Zhumadian City
Latitude (the project site):	North-west corner: 32°57'31" South-west corner: 32°57'22" South-east corner: 32°57'22" North-east corner: 32°57'31"
Longitude (the project site):	North-west corner: 114°03'39" South-west corner: 114°03'39" South-east corner: 114°03'52" North-east corner: 114°03'52"

## 2.5. Technical Project Description

The NGCC technology adopted in the proposed project consists of two phases of combined dynamic cycles: the first phase takes place in the gas turbine where the high temperature gas with about 1400°C generated by the natural gas combustion can power to rotate a coupled AC power generator to generate electricity - this is the Gas Cycle. In the second phase, the exhausted gas discharged from the gas turbine with about 600°C can generate steam with 540°C temperature and 10.67MPa pressure in a heat recovery boiler, which then expands in the followed up steam turbine to generate electric power in the AC power generator again - this is the Steam Cycle. Two phases of the cycles is combined to generate electricity with quite high efficiency. The designed installed capacity of the Project is 2x377.2 MW, which is aimed at gross electricity generation of 2,640.4000 GWh annually and 2,584.4235 GWh electricity delivered to the Central China Power Grid (CCPG) via Henan Provincial grid annually.

The main equipments, e.g. steam turbine and generator equipment package, are



provided jointly by a Company consortium from Shanghai and German Siemens respectively, which is well-known in the NGCC equipment production market.

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

**Table 2-5:** Technical data of the plant

Parameter	Unit	Value
<b>Gas Turbine</b>		
Manufacturer and Country of origin		Siemens Co. in Germany
Type		V94.3A
Rated speed	rpm	3,000
Flow rate of flue gas at the gas turbine	t/h	2396.5
Temperature of flue gas at the gas turbine	°C	586.5
Gas turbine output	MW	243.4
<b>Steam Turbine</b>		
Manufacturer and Country of origin		Shanghai Steam Turbine Co., Ltd
Type		TCF1
Rated speed	rpm	3,000
Steam turbine output	MW	133.8
<b>HRSG in Combined Cycle</b>		
Manufacturer and Country of origin		Wuhan Boiler Manufacture Co.
Feed water temperature of HRSG	°C	55
Output of generator	MVA	478
<b>Generator</b>		
Manufacturer and country of origin		Shanghai Elec. Group Co.
Rated voltage	kV	21
Rated current	A	13142
Rated frequency	Hz	50
Rated speed	rpm	3000
Total output for one set	MW	377.2

The project is connected to CCPG via the transformer in the plant. The natural gas consumed as fuel in this project comes from “West-to-East natural gas transmission Pipeline” (via Southern Henan branch pipeline). No supply constrains were expected.

The commenced electricity generation of #1 gas turbine is in June 2007, and the commenced electricity generation of #2 gas turbine is in December 2007. The commenced electricity generation of #1 steam turbine is in August 2007 and #2 steam turbine is in January 2008. The 1<sup>st</sup> renewable crediting period (7 years) started on 2009-08-25.

During the 1<sup>st</sup> periodic verification, covering the period 2009-08-25 to 2010-02-28, it was found that the technical parameters of the turbine and generator used under the project activity were in general identical as per description provided in the registered PDD.



A slight deviation has been observed. The type of the gas turbine is V94.3A instead of TCF1. The DOE could confirm that this is obviously a mistake, since the turbine supplier Siemens does not provide such gas turbine type.

The project complies with all relevant statutory requirements.

### 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<sup>/MR-1/</sup> submitted by the client and additional supporting documents with the use of customised verification protocol<sup>/CPM/</sup> according to the Validation and Verification Manual<sup>/VVM/</sup>,
- 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	2010-01-07
Uploading of Monitoring Report	2010-03-09
On-site visit	2010-03-24 ~ 2010-03-26
Draft reporting finalised	2010-04-13
Final reporting finalised	2010-05-31
Technical review finalised	2010-06-07

### 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, consistent of one team leader and 3 additional team members, was appointed. Furthermore also the personnel for the technical review and the final approval were determined.

The list of involved personnel, the tasks assigned and the qualification status are summarized in the table 3-1 below.

**Table 3-1:** Involved Personnel

	Name	Company	Function <sup>1)</sup>	Qualification Status <sup>2)</sup>	Scheme competence	Technical competence <sup>4)</sup>	Host country Competence	Team Leading competence
<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	LI Yong Jun	TN China	TL	SA	<input checked="" type="checkbox"/>	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	YAN Tao	TN China	TM	E	<input checked="" type="checkbox"/>	-	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Mr. <input checked="" type="checkbox"/> Ms.	YU Miao	TN China	-	T	<input type="checkbox"/>	-	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Winter Stefan	TN CERT	TM	E	<input checked="" type="checkbox"/>	G	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Winter Rainer	TN Cert	TR <sup>3)</sup>	SA	<input checked="" type="checkbox"/>	G	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Saalmann Martin	TN Cert	TR <sup>3)</sup> /FA	SA	<input checked="" type="checkbox"/>	-	<input type="checkbox"/>	<input checked="" type="checkbox"/>

- <sup>1)</sup> TL: Team Leader; TM: Team Member, TR: Technical review; FA: Final approval  
<sup>2)</sup> GHG Auditor Status: A: Assessor; E: Expert; SA: Senior Assessor; T: Trainee; TE: Technical Expert  
<sup>3)</sup> No team member  
<sup>4)</sup> As per S01-MU03 or S01-VA070 A2 (such as A, B, C.....)

### 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 2 weeks 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

<b>Table A-1: GHG calculation procedures and management control testing / Detailed audit testing of residual risk areas and random testing</b>				
<b>Identification of potential reporting risk</b>	<b>Identification, assessment and testing of management controls</b>	<b>Areas of residual risks</b>	<b>Additional verification testing performed</b>	<b>Conclusions and Areas Requiring Improvement (including Forward Action Requests)</b>
<i>The following potential risks were identified and divided and structured according to the possible areas of occurrence.</i>	<i>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</i>	<i>Despite the measures implemented in order to reduce the occurrence probability the following residual risks remain and have to be addressed in</i>	<i>The additional verification testing performed is described. Testing may include:</i> <ul style="list-style-type: none"> <li>- Sample cross checking of manual transfers of data</li> <li>- Recalculation</li> <li>- Spreadsheet 'walk throughs' to check</li> </ul>	<i>Having investigated the residual risks, the conclusions should be noted here. Errors and uncertainties are highlighted.</i>

**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)
	risks.  The following measures are implemented:	the course of every verification.	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.	

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

<b>Table A-2: Periodic verification checklist</b>				
<b>Checklist Item</b>	<b>Reference</b>	<b>Verification Team Comments</b>	<b>Draft Conclusion</b>	<b>Final Conclusion</b>
<i>The checklist items in Table A-2 are linked to the various requirements 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.</i>	<i>Gives reference to the information source on which the assessment is based on.</i>	<i>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.</i>	<i>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 verification stage.</i>	<i>In case of a corrective action or a clarification the final assessment at the final verification stage is given.</i>

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<sup>/PDD/</sup>,
- the last revision of the validation report<sup>/VAL/</sup>,
- the hosted monitoring report, including the claimed emission reductions for the project<sup>/MR-1/</sup>,
- the emission reduction calculation spreadsheet<sup>/XLS/</sup>.

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 on-site audit was carried out on 2010-03-24 and 2010-03-26. The complete verification team attended the site visit.

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 Zhongyuan Gas Power Company Ltd., Carbon Asset Management Sweden AB (project buyer) and the gas supplying company PetroChina 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
<ol style="list-style-type: none"> <li>1. Projects &amp; Operations Personnel, Huaneng Zhongyuan Gas Power Company Ltd. /IM01/</li> <li>2. Buyer, Carbon Asset Management Sweden AB /IM02/</li> <li>3. Gas Supplier, PetroChina Company Limited/IM03/</li> </ol>	<ul style="list-style-type: none"> <li>- General aspects of the project</li> <li>- Technical equipment and operation</li> <li>- Changes since validation</li> <li>- Monitoring and measurement equipment</li> <li>- Remaining issues from validation</li> <li>- Calibration procedures</li> <li>- Quality management system</li> <li>- Involved personnel and responsibilities</li> <li>- Training and practice of the operational personnel</li> <li>- Implementation of the monitoring plan</li> <li>- Monitoring data management</li> <li>- Data uncertainty and residual risks</li> <li>- GHG calculation</li> <li>- Procedural aspects of the verification</li> <li>- Maintenance</li> <li>- Availability of NG</li> <li>- Environmental aspect</li> <li>- Grid connection and power supply related aspects</li> </ul>



### 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 form 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 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<sup>/MR-1/</sup>, the calculation spreadsheet<sup>/XLS/</sup>, PDD<sup>/PDD/</sup>, the Validation Report<sup>/VAL/</sup> 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
H - Project history	0	0	0
U - Update on Changes and Incidents	0	1	0
R - Monitoring Report – General	3	2	0
P - Monitoring Parameters	3	3	1
C - Emission Reduction Calculation	1	0	0
Q - Quality Management	0	0	0
<b>SUM</b>	<b>7</b>	<b>6</b>	<b>1</b>

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:	U1		
<b>Classification</b>	<input type="checkbox"/> CAR	<input checked="" type="checkbox"/> CL	<input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	By means of on-site visit, the verification team found the name of the project owner has been changed from Henan Zhongyuan Gas Power Company Ltd. to Huaneng Zhongyuan Gas Power Company Ltd. Explanation and relating documents w.r.t change of information are necessary.		
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The relevant evidences (including the business licenses and the statement given by Zhumadian Industrial and Commercial Bureau) have been provided to show there is only a minor name change; the project owner has not changed. The revised MoC is being prepared and will be sent to the UN in due course and in line with the UN procedures.		



Finding:	U1
<b>DOE Assessment #1</b> <i>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.</i>	<p>The statement from Zhumadian Industrial and Commercial Bureau has been checked, which confirms the name of the project owner has been changed from Henan Zhongyuan Gas Power Company Ltd. to Huaneng Zhongyuan Gas Power Company Ltd. Both the old and new business licences have been crosschecked. Thus TÜV NORD comes to the conclusion that the project owner remains the same.</p> <p>According to EB 45 Annex 59 paragraph 17 the focal point will get in touch with the CDM Secretary to notify the name change. This has been confirmed in above corrective action. Hence, TÜV NORD assessed the CL as closed out.</p>
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input checked="" type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input type="checkbox"/> The project complies with the requirements

Finding:	R1
<b>Classification</b>	<input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p>In the monitoring report, the monitoring methodology and methodology tools applied by the project should be specified.</p>
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>The relevant part regarding monitoring methodology and methodology tools applied by the project has been specified according to the requirement of EB48, annex 68 in part A.2 of MR.</p>
<b>DOE Assessment #1</b> <i>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.</i>	<p>The relevant sections in MR have been checked. It can be confirmed that all methodologies applied to the project activities are specified correctly. Therefore, CL is closed.</p>
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input checked="" type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

Finding:	R2
<b>Classification</b>	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR

Finding:	R2
<b>Description of finding</b> Describe the finding in unambiguous style; address the context (e.g. section)	As per EB 48, Annex 68 paragraph 10, the implementation status of the project during the monitoring period under consideration is described insufficiently in MR. Revision is necessary.
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The relevant content regarding the implementation status has been incorporated according to the requirement of EB48, annex 68 in part A.2 of MR.
<b>DOE Assessment #1</b> <i>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.</i>	By means of interviews with the operational personnel, cross checked as per the plant operation log, equipments check & maintenance log and on-site observation, the verification team verified that neither relevant technical equipment nor operation mode was exchanged or modified within the monitoring period, and no incident occurred during this monitoring period. The implementation status of the project during the monitoring period has been included in the revised MR correctly. Therefore, CAR is closed.
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input checked="" type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

Finding:	R3
<b>Classification</b>	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Information on calibration frequency of monitoring instruments including gas flow meters and gas chromatography should be provided in monitoring report, according to EB48 Annex 68 paragraph 10. Revision is necessary.
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The information on calibration frequency for monitoring instruments including gas flow meters (once per year) and gas chromatography (once per year) has been described in updated monitoring report,
<b>DOE Assessment #1</b> <i>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.</i>	The relevant sections in MR have been checked. It can be confirmed that all information on calibration frequency of monitoring instruments are provided correctly. The calibration frequencies of monitoring instruments are in line with the MP and the national regulations. The calibrations of meters were conducted by qualified third parties. It is confirmed that the calibration is valid during the monitoring period 2009-08-25 to 2010-02-28. The calibration certificates have been checked to be reliable. Therefore, CAR is closed.

Finding:	R3
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

Finding:	R4
<b>Classification</b>	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	As per EB 48, Annex 68 paragraph 10, information on "Comparison of the actual emission reduction claimed in the monitoring period with the estimate in the registered PDD, and explanation on any significant increase." should be provided in monitoring report. Revision is necessary.
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The relevant part has been incorporated according to the requirement of EB48, annex 68 in part A.2 of MR, and there is no significant increase of the actual emission reduction in this monitoring period.
<b>DOE Assessment #1</b> <i>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.</i>	The comparison as provided in the MR based on emission reductions is not conclusive since the emission factor has been changed cp. to the one in the PDD. Hence, electricity generation or other appropriate shall be compared. CAR not yet closed.
<b>Corrective Action #2</b>	The comparison of the PLF during this monitoring period and the PLF in PDD has been added in updated MR.
<b>DOE Assessment #2</b>	<p>The PLF has been compared. The relevant sections in MR have been checked. During the monitoring period the supplied power from the project to the grid is 720,909 MWh, the average daily supplied electricity is 3834.6 MWh/day (PLF is 0.212), which is 45.84 % lower than the estimated in registered PDD 7080.6 MWh/day (2,584,423.5 MWh annually, PLF is 0.391). The monitored ER is lower than the ex-ante ER reported in the registered PDD.</p> <p>Therefore, CAR is closed.</p>
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input checked="" type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

Finding:	R5
<b>Classification</b>	<input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR



Finding:	R5
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The transparent calculation process for $EF_{BL,upstream,CH_4}$ should be provided.
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The calculation sheet of $EF_{BL,upstream,CH_4}$ has been provided in attachment (see “zhumadian leakage calculation”).
<b>DOE Assessment #1</b> <i>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.</i>	According to methodology the PDD, the $EF_{BL,upstream,CH_4}$ should be estimated ex post since it is calculated in context of CCPG gird BM emission factor. The latest available data has been applied and the calculation sheet of $EF_{BL,upstream,CH_4}$ has been assessed to be transparent and correct. Therefore, CL is closed.
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input checked="" type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

Finding:	P1
<b>Classification</b>	<input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The value of monthly gas consumption in emission reduction calculation sheet is not consistent with the recorded data. Revision is necessary.
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>The data of total gas consumption has been recorded both manually and automatically by computer.</p> <p>The data of total gas consumption in MR is sourced from manually records, which is 145,170,518 Nm<sup>3</sup> for this monitoring period<sup>2</sup>. This value has a minor difference (less than 0.3%) between the computer recording data 145,506,976 Nm<sup>3</sup> due to the error of manually record time (recording time could be slightly different in every day).</p> <p>Considering the computer recording time is more accurate and the value of total volume is more conservative for calculating the emission reduction, the computer recorded data 145,506,976 has been chosen and revised in updated MR.</p>
<b>DOE Assessment #1</b> <i>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.</i>	The MR and emission reduction calculation sheet have been revised correspondingly. The values indicated in the Excel sheet and in the computer data are exactly the same. Since the recorded data from the computer is more conservative, the CL is closed.

<sup>2</sup> Nm<sup>3</sup> means volume unit (m<sup>3</sup>) measured under the normal condition of 20°C (293.15K) and absolute pressure 101.325KPa (one standard atmospheric pressure)



Finding:	P1
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input checked="" type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input type="checkbox"/> The project complies with the requirements

Finding:	P2
<b>Classification</b>	<input type="checkbox"/> CAR <input type="checkbox"/> CL <input checked="" type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p>During the 1<sup>st</sup> monitoring period, the main gas flow meter No.1 and the back-up meter No.2 have been operated properly without abnormal situation. The recorded data from gas meter No.1 and No.2 has been used for emission reduction calculation. However, the type of backup gas flow meters (No.3, No.4, No.5, No.6) is inconsistent with the description in PDD. Clarification is requested.</p>
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>During this monitoring period, the type of gas flow meter #1 and #2 (two gas flow meters installed at the main gas metering point, #1 is the main meter and #2 is the backup meter), which is installed at supplier (China National Petroleum Corporation) side are in line with PDD. Meanwhile, both #1 and #2 have working properly, thus those four Back up meters (#3,4,5,6) installed at project site have only used for cross-checking. Furthermore, the gas consumption has also been cross-checked and confirmed with the receipts.</p> <p>The type of four back up gas flow meters are in line with the main gas meter #1 and its backup meter #2 (Turbo type gas flow meters) installed by the gas supplier: China National Petroleum Corporation (CNPC). The model of the meter is SM-RI-X-L manufactured by Elster-Instromet Group, U.S.</p> <p>At the design stage of the proposed project, the project owner planned to utilize SHCL (DN400)<sup>3</sup> ultrasonic meter in project site with accuracy of 0.5 level. However, according to the explanation from CNPC<sup>4</sup>, the utilization of ultrasonic meter is still at the experimental stage in China, and the technology of the ultrasonic metering was not mature and has not been widely applied in the host country. Due to above reason, the project owner has utilized the turbo gas flow meters as back meters at project site.</p> <p>The utilization of Turbo type gas flow meters for the proposed project meet the requirement of the gas supplier and industry standard. Furthermore, the accuracy of the turbo gas flow meters installed at projects site (<math>\pm 0.5\%</math>) has reached to the same accuracy of ultrasonic meters.</p> <p>Therefore, the adjustment of the meter type has neither affect the</p>

<sup>3</sup> <http://www.idol.com.cn/spzs/164563.html>

<sup>4</sup> <http://www.oilnews.com.cn/bk/system/2009/11/02/001263184.shtml>





Finding:	P2
	<p>monitoring accuracy nor brings any measurement uncertainties for the proposed project.</p> <p>The gas flow meters #4 and #6 have been installed in front of cross-check meters #3 and #5 as their further backup meters. As mentioned above, the main meters have all working properly during this monitoring period. Therefore, all those four Back up meters installed at project site have only used for cross-checking, and this adjustment would not bring any measurement uncertainties for the proposed project.</p>
<p><b>DOE Assessment #1</b></p> <p><i>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.</i></p>	<p>The calibration record, daily and monthly data record of gas meter No.1 and No.2 have been checked by verification team. The person in charge of NG metering in China Petroleum Corporation has been interviewed, it is confirmed that there is no malfunction of gas meter No.1 and No.2 during this monitoring period. Therefore the backup gas flow meters (No.3, No.4, No.5, No.6) were not applied for measuring the gas amount and have no impact on the calculation of emission reduction. The data from gas meter No.1 and No.2 applied in emission calculation is checked as reliable and correct.</p> <p>The accuracy of the turbo gas meter No.1 and No.2 is 1.0s, while the accuracy of the turbo backup gas flow meters (No.3, No.4, No.5, No.6) installed at project site is 0.5s which is more accurate than meter No.1 &amp; No.2 according to "Verification Regulation of Turbine Flow Meter" JJG 1037-2008. Based on technological expertise and by means of cross-checking TÜV NORD confirms that the accuracy (<math>\pm 0.5\%</math>) of the implemented turbo gas flow meters is comparable to those of ultrasonic meters<sup>5</sup> which the project owner designed to install.</p> <p>The recorded data of gas consumption from turbo backup gas flow meters (No.3, No.4, No.5, No.6) has been crosschecked, which is consistent with the data from gas meter No.1 and No.2.</p> <p>In conclusion, since there is in fact no impact on the emission reduction calculation TÜV NORD accepted the deviation from the registered monitoring plan (turbo gas flow meters vs. ultrasonic gas flow meters). However to be in line with the VVM Version 1.1 paragraph 203 TÜV NORD recommends a request for revision of monitoring plan to adjust the monitoring plan to the current situation or to implement the ultrasonic meters before the next periodic verification.</p>
<p><b>Conclusion</b></p> <p><i>Tick the appropriate checkbox</i></p>	<p><input checked="" type="checkbox"/> To be checked during the next periodic verification</p> <p><input type="checkbox"/> Appropriate action was taken</p> <p><input type="checkbox"/> Project documentation was corrected correspondingly</p> <p><input type="checkbox"/> Additional action should be taken</p> <p><input type="checkbox"/> The project complies with the requirements</p>

<sup>5</sup> <http://shakic.jdol.com.cn/productsDetail.html?id=164563>

Finding:		P3		
<b>Classification</b>	<input type="checkbox"/> CAR	<input checked="" type="checkbox"/> CL	<input type="checkbox"/> FAR	
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The value of NCV <sub>NG,y</sub> in parameter description of monitoring report is inconsistent with the recorded data. Revision is necessary.			
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The value of NCV <sub>NG,y</sub> has been updated as weighted average value in revised MR.			
<b>DOE Assessment #1</b> <i>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.</i>	The NCV value is measured by China Petroleum West-East Gas Transfer Pipeline Company Henan Province Xuedian Branch Station every ten days, which is fully in compliance with the methodology, i.e. fortnightly. The weighted NCV value of each month has been applied in the emission reduction calculation. It has been confirmed by the gas supplier Petrol China Company Ltd. that the value and calculation is reliable and correct. The weighted average value of NCV <sub>NG,y</sub> for the whole monitoring period has been calculated and presented in the MR. The emission reduction calculation sheet and the MR have been checked. It is confirmed that the value and calculation applied are overall correct. CL is closed.			
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input checked="" type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input type="checkbox"/> The project complies with the requirements			

Finding:		P4		
<b>Classification</b>	<input type="checkbox"/> CAR	<input checked="" type="checkbox"/> CL	<input type="checkbox"/> FAR	
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The frequency of the recording of NCV value is not consistent with the description in MR. In addition, the frequency should be justified to demonstrate the monitored NCV value is representative.			
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The frequency of NCV <sub>NG,y</sub> recording has been updated in revised MR as once every 10 days by the project owner, which meet the requirement of methodology and monitoring plan. The value of NCV has been provided by gas supplier and recorded by the project owner.			
<b>DOE Assessment #1</b> <i>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.</i>	According to AM0029 and PDD, the value of NCV has to be recorded fortnightly. During the 1 <sup>st</sup> monitoring period, the value has been measured and provided every ten days, which can be considered as more precise and representative. The CL is closed.			

Finding:	P4
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input checked="" type="checkbox"/> Appropriate action was taken <input type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

Finding:	P5
<b>Classification</b>	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p>Though the chosen value for the parameter <math>EF_{CO_2, NG, y}</math> is in line with the monitoring plan as set out in the PDD, as per AM0029 Ver. 3 p.12, it should use supplier-provided data, local data, country-specific values, that order of preference.</p>
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>According to the letter from supplier (China National Petroleum Corporation), the value is unavailable and cannot be provided by gas supplier. Therefore, according to PDD, the country value of 15.3tC/TJ<sup>6</sup> which sourced from IPCC default value has been applied for calculating the emission reduction.</p>
<b>DOE Assessment #1</b> <i>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.</i>	<p>The value applied, which is sourced from IPCC, is in line with the PDD and methodology since the supplier-provided data and local data are not available, and the country-specific value is sourced from IPCC. The Letter from gas supplier has been checked to be reliable. The host county applied value has also been checked. The CAR is closed.</p>
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

Finding:	P6
<b>Classification</b>	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p>The monitoring mode w.r.t electricity meter No.3 is not consistent with the description in PDD.</p>
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>As the requirement of local grid company, on 26<sup>th</sup> February 2010, the previous meter in project site M3 (Serial No: 33049104, with accuracy 0.2s) has been replaced by a new installed meter (Serial No: 33049113, with accuracy 0.2s). Meanwhile, the new meter has been calibrated by qualified party before utilization. During this monitoring period, both the previous meter and new meter worked normally and have been calibrated quarterly.</p>

<sup>6</sup> DNA website of host country: <http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File2413.pdf>

Finding:	P6
<b>DOE Assessment #1</b> <i>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.</i>	<p>During 2009-08-25 to 2010-02-25, the recorded data from Meter No.3 located at project site has been used for emission reduction calculation, which is in line with the MP. There is no malfunction of Meter No.3 during this period.</p> <p>Since 2010-02-26, new Meter No.3 with the accuracy of 0.2s (the same as Meter No.1, No.2 and No.3) has been installed at project site, meanwhile the old meter No.3 has been replaced.</p> <p>The new Meter No.3 will be calibrated quarterly and the data from the new Meter No.3 will be measured continuously and recorded daily and monthly. The calibration records for old Meter No.3 and new Meter No.3 covering the monitoring period have been checked as appropriate.</p> <p>The meter replacement is done according to the local grid company's periodic replacement schedule. So, the replacement is initiated by the grid company.</p> <p>The CAR is closed.</p>
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input checked="" type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

Finding:	P7
<b>Classification</b>	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p>Formulae applied to calculate <math>EF_{grid,BM,y}</math> is not completely provided in the MR. Parameters indicated in the monitoring section are addressed which are missing in the theoretical approach to calculate the ER. Revision is necessary.</p>
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>The theoretical approach and steps has been updated in monitoring report and the calculation sheet of the <math>EF_{grid,BM,y}</math> has been attached.</p>
<b>DOE Assessment #1</b> <i>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.</i>	<p>The calculated <math>EF_{grid,BM,y}</math> has been included in the revised MR. The calculation sheet of the <math>EF_{grid,BM,y}</math> has been checked and assessed to be correct and all the parameters involved in the monitoring report are addressed in the calculation. Therefore, CAR is closed.</p>
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

Finding:	C1
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Finding:	C1		
<b>Classification</b>	<input checked="" type="checkbox"/> CAR	<input type="checkbox"/> CL	<input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The theoretical approach of calculating $EF_{BL,upstream,CH_4}$ is not provided in the Monitoring Report. Revision is necessary.		
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The theoretical approach and steps of calculating $EF_{BL,upstream,CH_4}$ has been added in updated monitoring report.		
<b>DOE Assessment #1</b> <i>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.</i>	The theoretical approach of calculating $EF_{BL,upstream,CH_4}$ has been included in the revised MR. The calculation sheet of the $EF_{BL,upstream,CH_4}$ has been checked and assessed to be correct. Therefore, CAR is closed.		
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input checked="" type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> 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 CLs 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

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 main metering equipment, the project has been implemented and operated as described in the registered PDD<sup>/PDD/</sup>.

The project exported electricity to the Central China Power Grid (CCPG). The recorded generation data<sup>/DMR/</sup>, meter readings<sup>/MMR/</sup>, meter calibration certificates<sup>/CAL/</sup>, monthly electricity sale/purchase-invoices, power balance sheet<sup>/INO/</sup> and plant operation records<sup>/O&M/</sup> were verified by the verification team during the on site visit.

The commenced electricity generation of #1 gas turbine is in June 2007, and the commenced electricity generation of #2 gas turbine is in December 2007. The commenced electricity generation of #1 steam turbine is in August 2007 and #2 steam turbine is in January 2008. Electricity generated by the project is transmitted to Chaya Transformer Substation (500kV Zhoucha Line), and then connected to the Central China Power Grid (CCPG), which contains Henan, Hubei, Hunan, Jiangxi, Sichuan and Chongqing Power 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 for the same have been implemented in an appropriate manner.

For the electric metering purpose, three sealed meters i.e. Meter No.1, Meter No.2 and Meter No.3 are installed for measuring the net electricity delivered to the grid. The Meter No.1 and Meter No.2 are bidirectional meters with accuracy 0.2S located on the Plant side of the 500kV Chaya main substation, which is used as invoice meters measuring exported and imported power. The dual meters are set up, one is the primary meter and another is the backup one. In case the meter No.1 is detected in fault, the backup meter No.2 will replace the No.1 for billing. These two meters have reverse metering function to measure the electricity purchased and supplied. During this monitoring period, there is no malfunction detected in meter No.1, therefore meter No.2 was not required for electricity metering. The meter reading time is fixed at 00:00 on the first day of each month. The 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 needed for starting up the power units.



The electricity is measured continuously and recorded monthly. The meter reading records are confirmed by the Grid Company and PP together.

Meter No.3 has been exchanged on 26/02/2010 which is in line with the local grid company's periodic replacement schedule to allow for a unified calibration management. Before the replacement, Meter No.3 is in normal condition and there is no malfunction detected. The new Meter No.3 is of the same type and accuracy 0.2S. It has been calibrated before utilization. The calibration is valid for the 1<sup>st</sup> monitoring period. The measurements are cross-checked by an alternative meter with accuracy of 0.2S installed at Xiaozhuyuan (XZY) substation. During the meter exchange, the data from backup alternative meter in (XZY) substation was adopted. The calibration record of the meter has been checked, which is in line with the regulation (DL/T448-2000) and no error has occurred. The recorded data has been checked by verification team. The data applied during meter exchange has also been confirmed by power grid, the confirmation has been assessed as reliable through on-site interview. Therefore, the data of electricity imported from the grid during the Meter No.3 exchange is reliable.

There is no malfunction of Meter No.1, No.2, No.3 and new Meter No.3 during this monitoring period. All four meters mentioned above 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:** Key electric meters information

Item	Serial No.	Type	Accuracy	Calibration covering monitoring period	Calibration valid until	Calibration entity
Meter No.1	18450580	WU. TE432S	0.2s	26/07/2009 22/10/2009 20/01/2010	19/04/2010	Testing and Research Institute of Henan Electric Power Institute, which is authorized by Administration of Quality and Technology Supervision of Henan Province.
Meter No.2	18450567	WU. TE432S	0.2s	26/07/2009 22/10/2009 20/01/2010	19/04/2010	
Meter No.3	33049104	SL7000	0.2s	26/07/2009 22/10/2009 20/01/2010	19/04/2010	
Meter No.3 (New)	33049113	SL7000	0.2s	26/02/2010	25/05/2010	

**Table 5-2: Key transformer information**

	Serial No.	Calibration Date	Ratio	Calibration entity
<b>PT (M1 &amp; M2)</b>	A: 06-1100 B: 06-1093 C: 06-1094	2006-11-28 to 2006-12-01 (valid until 2016-11-30)	5000	Testing and Research Institute of Henan Electric Power Institute, which is authorized by Administration of Quality and Technology Supervision of Henan Province.
<b>CT (M1 &amp; M2)</b>	A: 050761 B: 050765 C: 050762	2006-11-28 to 2006-12-01 (valid until 2016-11-30)	1500	

The calibration records of all installed measurement devices as well as the Current Transformer (CT) / Potential Transformer (PT) which covered this monitoring period were checked and assessed to be credible and appropriate.

For the natural gas metering purpose, two sealed Gas Flow Meters i.e. Gas Meter No.1 and Gas Meter No.2 are installed for measuring the natural gas consumed by the project located in front of the natural gas delivery point belong to gas supplier side. The two turbo type gas meters with accuracy 1.0S are used as invoice meters. The gas consumptions are measured continuously and recorded daily. The meter reading records<sup>/MMR/</sup> are confirmed by the Gas Company and PP together. The two meters mentioned above are calibrated yearly by a third party institute. Neither mistakes nor malfunction have been observed during this monitoring period.

**Table 5-3: Key gas flow meters information**

Item	Serial No.	Type	Accuracy	Calibration covering monitoring period	Calibration entity
Gas Meter No.1	83034891	TRZ-IFSG4000 DN300AN SI600	1.0s	27/12/2008 to 26/12/2010 08/12/2009 to 07/12/2011	Henan Institute of metrology and Testing, which is authorized by General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China.
Gas Meter No.2	83034059		1.0s	31/11/2008 to 30/11/2010 19/10/2009 to 18/11/2011	



**Table 5-4: On-line gas chromatography analyzer**

Name	Serial No.	Type	Manufac ture	Calibration covering monitoring period	Calibration entity
on-line gas chromato graphy analyzer	100839	BTU- 8000	ABB	22/06/2009 to 06/06/2010	National Institute of Metrology P.R.China, which is authorized by Certification and Accreditation Administration of the People's Republic of China

The measurement of the NCV is carried out by one set of on-line gas chromatography analyzer by acquiring the gas sample from the continuous operated sampling line which is linked with the gas flow at the 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 chromatography analyzer which covered this monitoring period were checked and assessed to be credible and appropriate.

There happened no physical change and no accident to the project during the monitoring period<sup>/LOG/</sup>.

An emergency back-up diesel generator was installed for emergency response (i.e. power source breakdown). As per operation procedure<sup>/DGO/</sup>, it was started up three times every month for maintenance. The consumption of diesel was recorded<sup>/DGO/</sup>. Since the consumption was very limited, the related emissions were ignored. Please refer to Section 5.8 for details.

The submitted monitoring report which forms the basis of the verification was prepared by summarizing consolidated monthly data of net electricity supplied, natural gas delivered and NCV value over the whole monitoring period in accordance with the registered PDD<sup>/PDD/</sup>.

During the monitoring period, the project exported 720,909.606 MWh of net electricity and consumed 145,506,976 Nm<sup>3</sup> of natural gas. The net electricity supplied and the natural gas consumed are verified by the verification team during the on site visit by checking the Monthly Meter reading records<sup>/MMR/</sup> and Daily Meter reading records<sup>/DMR/</sup>. The data was also cross-checked with the electricity sale/purchase invoices and gas purchase invoices.

## 5.2. Project history

The project history from registration date is listed as below:

**Table 5-2: Project history from registration date**

Events	Date
--------	------

Events	Date
Registration date	2009-08-25
<b>1<sup>st</sup> periodic verification</b>	
Monitoring period	2009-08-25 to 2010-02-28

### 5.3. Special events

One special event with effect on the monitoring of the project has been observed during the 1<sup>st</sup> monitoring period.

Replacement of M3 has been carried out on 26/02/2010 due to the local grid company's periodic replacement schedule to allow for a unified calibration management. Before the replacement, Meter No.3 is in normal condition and there is no malfunction detected. The new Meter No.3 with the same type and has been calibrated before utilization.

### 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 (version 3).

### 5.6. Monitoring parameters

During the verification all relevant monitoring parameters (as listed in chapter 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.

After appropriate corrections were carried out by the project participant 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.

## 5.7. Monitoring report

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

During the verification, mistakes and needs for clarification were identified. The PP has carried out the requested corrections so that it can be confirmed that the Monitoring report is complete and transparent and in accordance with the registered PDD and other relevant requirements.

## 5.8. ER Calculation

According to the validated PDD, the approved baseline and monitoring methodology AM0029 Ver.3 is applied to the project.

GHG emission reduction is calculated as baseline emission minus project emission and leakage emission.

For the calculation of baseline emissions the ex-post determined value of baseline parameters, i.e., the latest value of CCPG Emission Factor available at the DNA website at the time of verification will be used.

### **Baseline Emissions:**

The formula used for the determination of baseline emissions which is consistent with the PDD and revised Monitoring Report:

Baseline Emissions =	Grid BM Emission Factor	x	Net Electricity Export
tCO <sub>2</sub> /y	tCO <sub>2</sub> /MWh		MWh/y
418,271.753 =	0.5802	x	720,909.606

The baseline emissions (BE) during the monitoring period are 418,271.753 tCO<sub>2</sub>.

Following documents/records were verified by the audit team:

- Monthly invoices from 2009-08-25 to 2010-02-28
- Monthly electricity balance sheet issued by GP from 2009-08-25 to 2010-02-28.
- Daily meter readings from 2009-08-25 to 2010-02-28
- Monthly meter readings from 2009-08-25 to 2010-02-28.
- Meters calibration records (covering the monitoring period).

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 reduction calculation were derived from the meter readings as well as monthly electricity balance sheets. All the data were issued or confirmed by the GP and cross checked with the monthly invoices.

### **Project Emission:**

The formula used for the determination of project emissions is consistent with the PDD and revised Monitoring Report:

$$\begin{array}{llll} \text{Project Emissions} = & \text{total NG combusted} \times & \text{CO}_2 \text{ emission coefficient of NG} & \\ & & (\text{i.e. } \text{NCV}_{\text{NG}} \times \text{EF}_{\text{CO}_2, \text{NG}, \text{y}} \times \text{OXID}_{\text{NG}}) & \\ \text{tCO}_2/\text{y} & \text{Nm}^3 & \text{tCO}_2/\text{Nm}^3 & \\ 277,810 = & 145,506,976 & \times & 34.0331 \times 15.30 \times 1.00 \times 44/12/10^6 \end{array}$$

The baseline emissions (BE) during the monitoring period are 277,810 tCO<sub>2</sub>.

Following documents/records were verified by the audit team:

- Monthly NG invoices from 2009-08-25 to 2010-02-28
- Monthly NG balance sheet issued by Gas Supplier from 2009-08-25 to 2010-02-28.
- Daily gas meter readings from 2009-08-25 to 2010-02-28
- Monthly gas meter readings from 2009-08-25 to 2010-02-28.
- Gas Meters calibration records (covered the monitoring period).

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 reduction calculation were derived from the gas meter readings and cross checked with NG balance sheets. All the data were issued or confirmed by the Gas Supplier and cross checked by the monthly invoices.

The emission of the diesel generator which is utilized as back-up in case of emergency was also taken into account in MR. The default 2006 IPCC upper carbon content and oxidation factor of diesel, and net calorific value of diesel citing from China Energy Statistical Yearbook were used to the emission calculation. All the data source and calculation formula were verified. No error was found in the calculation of the diesel generator emission. The emission of the diesel generator accounts only for 0.000152% of the total emissions during this monitoring period, hence it was ignored. The operational hours of diesel generator was measured and calculated through the daily diesel operation and consumption records. As per operation procedure<sup>/DGO/</sup>, it was started up three times every month for maintenance. No emergency on power source was taken place during the 1<sup>st</sup> monitoring period. The corresponding evidences<sup>/DGO/</sup> including diesel consumption records, diesel generator operation log, nameplate of diesel generator etc. were checked by the verification team. No other fuel has been used during the monitoring period.

### **Project Leakage:**

The formula used for the determination of project leakage which is consistent with the PDD and revised Monitoring Report:

$$\text{Project Leakage} = \text{FC}_y \times \text{NCV}_{\text{NG},y} \times \text{EF}_{\text{NG,upstream,CH}_4} \times 21 - \text{EGG}_{\text{PJ},y} \times \text{EF}_{\text{BL,upstream,CH}_4} \times 21$$

tCO <sub>2</sub> /y	tCO <sub>2</sub> /y	tCO <sub>2</sub> /y
0 =	1465.809 x 21 -	2941.147 x 21

According to the AM0029 version3, negative leakage should be considered as zero. Following documents/records were verified by the audit team:

- Every ten days meter readings of NCV value from 2009-08-25 to 2010-02-28
- On-line gas chromatography analyzer calibration records (covering the monitoring period).

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 reduction calculation were derived from the on-line gas chromatography analyzer readings. All the data were issued by the Gas Supplier.

LNG is not used in the project plant and no natural gas from Annex I countries which could lead to upstream emission has been used in the project plant.

### **Comparison of actual ER with estimated ER**

The electricity comparison within the same period should also be conducted for Emission Reduction comparison. During the monitoring period (2009-08-25 to 2010-02-28) the supplied power from the project to the grid is 720,909 MWh, the average daily supplied electricity is 3834.6 MWh/day (PLF is 0.212), which is 45.84% lower than the estimated in registered PDD 7080.6 MWh/day (2,584,423.5 MWh annually, PLF is 0.391).

There is no significant increase of the actual electricity generation in this monitoring period comparing with registered PDD.

## **5.9. Quality Management**

Quality Management procedures for measurements, collection and compilation of data, data storage and archiving, calibration, maintenance and training of personnel in the framework of this CDM project activity have been defined in a monitoring manual and relevant procedure. The procedures defined can be assessed as appropriate for the purposes indicated above. No significant deviations thereof have been observed during the verification.

The data recorder 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 will be calibrated quarterly; the gas flow meters and gas chromatography analyzer will be calibrated yearly. The calibration records covering the monitoring period were maintained.

Internal audit was planned and performed once every monitoring period, the latest internal audit was performed on 1 Nov 2009 and records are maintained. Records have been checked by the validation team. No special events or events outside the range have been observed.

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.

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 the COP/CMP and the CDM EB (clarifications and/or guidance).

## **5.10. 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.

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 the COP/CMP and the CDM EB (clarifications and/or guidance).

## **5.11. Hints for next periodic Verification**

A FAR was raised as below:

The type of back-up flow meters no. 3 – 6 is different to those addressed in the PDD (turbo type vs. ultrasonic). Therefore a revision of monitoring plan is requested after the 1<sup>st</sup> verification period.



## 6. VERIFICATION OPINION

Carbon Asset Management Sweden AB has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 1<sup>st</sup> 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 reduces GHG emissions due to electricity generation by utilizing of available natural gas. This verification covers the period from 2009-08-25 to 2010-02-28 (including both days).

In the course of the verification 7 Corrective Action Requests (CAR) and 6 Clarification Requests (CL) were raised and successfully closed. Furthermore 1 FAR is 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. 3
- 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 1<sup>st</sup> 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: 140,461 t CO<sub>2e</sub>

Shanghai, 2010-06-07

Essen, 2010-06-07



Li Yong Jun

TÜV NORD JI/CDM Certification  
Program

Verification Team Leader



Martin Saalman

TÜV NORD JI/CDM Certification  
Program

Senior Assessor

## 7. REFERENCES

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

Reference	Document
<b>/BL/</b>	<ol style="list-style-type: none"> <li>1. Business License</li> <li>2. Business License (after name changed)</li> <li>3. The approval of company name change by Huaneng Power International, INC.</li> <li>4. The statement of company name change by Zhumadian Industry and Commercial Bureau</li> </ol>
<b>/CAL1/</b>	<ol style="list-style-type: none"> <li>1. Calibration Certificate of Electric Meter1, Meter2 and Meter3 covering the 1st monitoring period</li> <li>2. Procedure of control of monitoring meters.</li> <li>3. Metering standards (national industry standard DL/T448-2000).</li> <li>4. Certificate of electric meter calibration entity</li> <li>5. Calibration Certificate for PT &amp; CT- Testing and Research Institute of Henan Electric Power Institute, which is authorized by Administration of Quality and Technology Supervision of Henan Province.</li> </ol>
<b>/CAL2/</b>	<ol style="list-style-type: none"> <li>1. Calibration Certificate of Gas flow Meter1, Meter2, Meter3, Meter4, Meter5 and Meter6 covering the 1st monitoring period</li> <li>2. Procedure of control of monitoring meters.</li> <li>3. Gas Flow Metering standards (national standard GB/T18603-2001, JJG 1037-2008 and JJG 198-1994)</li> <li>4. Certificate of electric gas flow meter calibration entity, Certificate No. (Guo) Fa Ji[2007]01031</li> </ol>
<b>/CAL3/</b>	<ol style="list-style-type: none"> <li>1. Calibration Certificate of on-line gas chromatography analyzer covering the 1st monitoring period</li> <li>2. Procedure of control of monitoring device.</li> <li>3. Gas chromatography analyzer standards (national standard GB/T13610-2003)</li> <li>4. Certificate of on-line gas chromatography analyzer calibration entity</li> </ol>
<b>/DGO/</b>	<p>Diesel Generator Operation Documents</p> <ol style="list-style-type: none"> <li>1. Diesel generator operation procedure.</li> <li>2. Diesel consumption records.</li> <li>3. Diesel generator operation log</li> <li>4. Nameplate of diesel generator</li> </ol>
<b>/DMR/</b>	<ol style="list-style-type: none"> <li>1. Daily electric Meter1, Meter2, Meter 3, New Meter 3 and Alternative Meter (in XYZ substation) Reading Record covering from 25 August 2009 to 28 February 2010.</li> </ol>



Reference	Document
	2. Daily gas flow Meter1, Meter3, Meter 3, Meter 4, Meter 5 and Meter 6 Reading Record covering from 25 August 2009 to 28 February 2010
<b>/EPCA/</b>	Environmental Protection Check and Acceptance Letter, issued by Ministry of Environmental Protection of the People's Republic of China on 16 June 2009, Document No. Huan Yan [2009]171
<b>/GCA/</b>	Grid connection and dispatching agreement, signed by Central China Power Grid Co., Ltd and Henan Zhongyuan Gas Power Plant, on 23 March 2007
<b>/IAR/</b>	Internal Audit Report
<b>/INO/</b>	<ol style="list-style-type: none"> <li>1. Monthly electricity invoices covering from 25 August 2009 to 28 February 2010.</li> <li>2. Monthly electricity balance sheet issued by GP from 25 August 2009 to 28 February 2010.</li> <li>3. Monthly gas invoices covering from Jan from 25 August 2009 to 28 February 2010.</li> <li>4. Monthly gas balance sheet issued by GP from 25 August 2009 to 28 February 2010.</li> </ol>
<b>/LOG/</b>	<ol style="list-style-type: none"> <li>1. Sample copy of project operation records</li> <li>2. Equipments daily check log</li> </ol>
<b>/LGS/</b>	Letter from gas supplier which confirms the Gas composition data is not available.
<b>/MM/</b>	Monitoring Manual/ QA/QC procedures
<b>/MMR/</b>	<ol style="list-style-type: none"> <li>1. Monthly electricity Meter reading records which are confirmed by GP from 25 August 2009 to 28 February 2010</li> <li>2. Monthly gas Meter reading records which are confirmed by Gas supplier from 25 August 2009 to 28 February 2010</li> <li>3. NCV reading records which are confirmed by the gas supplier Petrol China Company Ltd. from 25 August 2009 to 28 February 2010</li> <li>4. Alternative electricity Meter (in XYZ substation) reading records which are confirmed by the power grid from 26 February 2010 to 28 February 2010</li> </ol>
<b>/MR1/</b>	Monitoring report 'Zhumadian Zhongyuan Gas-Steam Combined Cycle Power Project in Henan China' for the period 2009-08-25 to 2010-02-28, version 01, dated 04 March 2010.
<b>/MR2/</b>	Monitoring report 'Zhumadian Zhongyuan Gas-Steam Combined Cycle Power Project in Henan China' for the period 2009-08-25 to 2010-02-28, version 02, dated 25 May 2010.

Reference	Document
<b>/NOSR/</b>	NGCC Operation Safety Management Regulations
<b>/O&amp;M/</b>	1. Project Operation and Maintenance Records/Equipments Check & maintenance log 2. Sample copy of O&M records
<b>/PHT/</b>	Photographs of Project Site
<b>/PPSC/</b>	1. Power Purchase and Sale Contract signed by Huaneng Zhongyuan Gas Power Company Ltd. and Henan Electric Power Company Zhumadian power company on 28 November 2008 2. High-voltage Power Purchase and Sale Contract between signed by Huaneng Zhongyuan Gas Power Company Ltd. and Henan Electric Power Company on 1 January 2009 3. Gas Purchase and Sale Contract signed by Henan Zhongyuan Gas Power Plant and Petrol China Company Ltd. on 18 May 2008, and the supplementary contract signed on 8 October 2009
<b>/PWD/</b>	1. Power Wiring Diagram 2. Gas pipeline connection Diagram
<b>/RTC/</b>	Project Responsibilities, Training and Competence Records: 1. Project Organization Chart and responsibilities 2. Staff Training Plan finalized on 12 January 2009 and Records from 2009-08-25 to 2010-02-28 3. Certificate of CDM training 4. Sample Copy of Operator Certificates
<b>/TP/</b>	Operation Testing report for Gas turbine and Generator
<b>/XLS/</b>	Emission Calculation sheets provided by the project participant (related to MR).

**Table 7-2:** Background investigation and assessment documents

Reference	Document
<b>/AM29/</b>	Approved CDM Methodology AM0029, version 03: "Baseline Methodology for Grid Connected Electricity Generation Plants using Natural Gas"
<b>/CPM/</b>	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)
<b>/IPCC/</b>	1. 1996 IPCC Guidelines for National Greenhouse Gas Inventories: work book

Reference	Document
	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 2009-08-24
/VVM/	UNFCCC Validation and Verification Manual (Version as per EB 51)

**Table 7-3:** Websites used

Reference	Link	Organisation
/dna-HP/	<a href="http://www.cdm.ccchina.gov.cn">www.cdm.ccchina.gov.cn</a>	DNA of China
/dna-SP/	<a href="http://www.energimyndigheten.se/en/">http://www.energimyndigheten.se/en/</a>	DNA of Sweden
/mep/	<a href="http://www.zhb.gov.cn/">http://www.zhb.gov.cn/</a>	Ministry of Environmental Protection of China
/unfccc/	<a href="http://cdm.unfccc.int">http://cdm.unfccc.int</a>	UNFCCC
/ipcc/	<a href="http://www.ipcc-nggip.iges.or.jp">www.ipcc-nggip.iges.or.jp</a>	IPCC publications

**Table 7-4:** List of interviewed persons

Reference	Mol <sup>1</sup>		Name	Organisation / Function
/IM01/	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms	Chen Zhiqiang	Huaneng Zhongyuan Gas Power Company Ltd / CDM Project Manager
/IM01/	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms	Lu Wenjie	Huaneng Zhongyuan Gas Power



Reference	Mol <sup>1</sup>		Name	Organisation / Function
				Company Ltd / Equipment Department Engineer
/IM01/	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms	Mei Fuhua	Huaneng Zhongyuan Gas Power Company Ltd / Electronic Control Department Engineer
/IM01/	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms	Liu Zhengwei	Huaneng Zhongyuan Gas Power Company Ltd / Heat Control Department Engineer
/IM01/	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms	Lv Yang	Huaneng Zhongyuan Gas Power Company Ltd / Power Generation Department Engineer
/IM01/	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms	Chang Haihong	Huaneng Zhongyuan Gas Power Company Ltd / Power Generation Department Engineer
/IM01/	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms	Li Changchun	Huaneng Zhongyuan Gas Power Company Ltd / Power Generation Department Engineer
/IM01/	V	<input type="checkbox"/> Mr. <input checked="" type="checkbox"/> Ms	Ji Feng	Huaneng Zhongyuan Gas Power Company Ltd / Electricity Data Account
/IM02/	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Li Hui	Carbon Asset Management Sweden AB
/IM02/	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms	Shi Weiwei	Carbon Asset Management Sweden AB
/IM03/	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms	Li Wei	PetroChina Company Limited/ Gas Supply Station Operator

<sup>1)</sup> Means of Interview: (Telephone, E-Mail, Visit)

# 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 <i>Forward Action Requests</i> )
<b>Raw data generation</b>				
<ul style="list-style-type: none"> <li>• Installation of measuring equipment</li> <li>• Dysfunction of installed equipment</li> <li>• Maloperation by operational personnel</li> <li>• Downtimes of equipment</li> <li>• Exchange of equipment</li> <li>• Change of measurement equipment characteristic</li> <li>• Insufficient accuracy</li> <li>• Change of</li> </ul>	<ul style="list-style-type: none"> <li>• Installation of modern and state of the art equipment</li> <li>• Process control automation</li> <li>• Internal data review</li> <li>• Regular visual inspections of installed equipment</li> <li>• Only skilled and trained personnel operates the relevant equipment</li> <li>• Daily raw data checks</li> <li>• Immediate exchange of dysfunctional equipment</li> <li>• Stand-by duty is</li> </ul>	<ul style="list-style-type: none"> <li>• Inadequate installation / operation of the monitoring equipment</li> <li>• Inadequate exchange of equipment</li> <li>• Change of personnel</li> <li>• Undetected measurement errors</li> <li>• Inappropriateness of Management system procedures w.r.t. monitoring plan requirements (e.g. substitute value strategies)</li> <li>• Non-application of management system</li> <li>• Insufficient accuracy</li> </ul>	<ul style="list-style-type: none"> <li>• Site – visit (maintenance dept., gas supplier)</li> <li>• Check of equipment</li> <li>• Check of technical data sheets</li> <li>• Check of suppliers information / guarantees</li> <li>• Check of calibration records, if applicable</li> <li>• Check of maintenance records</li> <li>• Counter-check of raw data and commercial data</li> <li>• Check of CDM management system</li> </ul>	<b>OK</b>

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 <i>Forward Action Requests</i> )
<ul style="list-style-type: none"> <li>technology</li> <li>Accuracy of values supplied by Third Parties</li> </ul>	<ul style="list-style-type: none"> <li>organized</li> <li>Training</li> <li>Internal audit procedures</li> <li>Internal check of QA/QC measures of involved Third Parties</li> </ul>	<ul style="list-style-type: none"> <li>Inappropriate QA/QC measures of Third Parties</li> </ul>	<ul style="list-style-type: none"> <li>Check of CDM related procedures</li> <li>Application of CDM management system procedures</li> <li>Check of trainings</li> <li>Check of responsibilities</li> <li>Check of QA/QC documentation / evidences of involved Third Parties</li> </ul>	
<b>Raw data collection and data aggregation</b>				
<ul style="list-style-type: none"> <li>Wrong data transfer from raw data to daily and monthly aggregated reporting forms</li> <li>IT Systems</li> <li>Spread sheet programming</li> <li>Manual data transmission</li> </ul>	<ul style="list-style-type: none"> <li>Cross-check of data</li> <li>Plausibility checks of various parameters.</li> <li>Appropriate archiving system</li> <li>Clear allocation of responsibilities</li> <li>Application of CDM Management system procedures</li> </ul>	<ul style="list-style-type: none"> <li>Unintended usage of old data that has been revised</li> <li>Incomplete documentation</li> <li>Ex-post corrections of records</li> <li>Ambiguous sources of information</li> <li>Non-application of management system procedures</li> </ul>	<ul style="list-style-type: none"> <li>Check of data aggregation steps</li> <li>Counter-calculation</li> <li>Data integrity checks by means of graphical data analysis and calculation of specific performance figures</li> <li>Check of management system certification</li> </ul>	<b>OK</b>





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 <i>Forward Action Requests</i> )
<ul style="list-style-type: none"> <li>Data protection</li> <li>Responsibilities</li> </ul>	<ul style="list-style-type: none"> <li>Usage of standard software solutions (Spreadsheets)</li> <li>Limited access to IT systems</li> <li>Data protection procedures</li> </ul>	<ul style="list-style-type: none"> <li>Manual data transfer mistakes</li> <li>Unintended change of spread sheet programming or data base entries</li> <li>Problems caused by updating/upgrading or change of applied software</li> </ul>	<ul style="list-style-type: none"> <li>Check of data archiving system</li> <li>Check of application of Management system procedures</li> </ul>	
<b>Other calculation parameters</b>				
<ul style="list-style-type: none"> <li>Emission factors, oxidation factors, coefficients</li> </ul>	<ul style="list-style-type: none"> <li>The values and data sources applied are defined in the PDD and monitoring plan</li> </ul>	<ul style="list-style-type: none"> <li>Unintended or intended Modification of calculation parameters</li> <li>Wrong application of values</li> <li>Misinterpretations of the applied methodology and/ or the PDD</li> <li>Missing update of applicable regulatory framework (e.g. IPCC values)</li> </ul>	<ul style="list-style-type: none"> <li>Update-check of regulatory framework</li> <li>Countercheck of the applied MP in the MR against the methodology and the PDD</li> </ul>	<b>OK</b>
<b>Calculation Methods</b>				



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 <i>Forward Action Requests</i> )
<ul style="list-style-type: none"> <li>Applied formulae</li> <li>Miscalculation</li> <li>Mistakes in spread-sheet calculation</li> </ul>	<ul style="list-style-type: none"> <li>Advanced calculation and reporting tools</li> <li>A CDM coordinator is in charge of the CDM related calculations</li> <li>Usage of tested / counterchecked Excel spreadsheets</li> <li>Involvement of external consultants</li> </ul>	<ul style="list-style-type: none"> <li>The danger of miscalculation can only be minimized.</li> </ul>	<ul style="list-style-type: none"> <li>Countercheck on the basis of own calculation.</li> <li>Spread sheet walk-through.</li> <li>Plausibility checks</li> <li>Check of plots</li> </ul>	OK
<b>Monitoring reporting</b>				
<ul style="list-style-type: none"> <li>Data transfer to the author of the monitoring report</li> <li>Data transfer to the monitoring report</li> <li>Unintended use of outdated versions</li> </ul>	<ul style="list-style-type: none"> <li>An experienced CDM consultant is responsible for monitoring reporting.</li> <li>CDM QMS procedures are defined</li> </ul>	<ul style="list-style-type: none"> <li>The danger of data transfer mistakes can only be minimized</li> <li>Inappropriate application of QMS procedures</li> </ul>	<ul style="list-style-type: none"> <li>Counter check with evidences provided.</li> <li>Audit of procedure application</li> </ul>	OK

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

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<b>1. Project history</b>				
<b>1.1 Open issues from validation</b> <b>(EB 51 Annex 3 §§ 180, 187 (c)), 217 f</b> <i>Check (esp. in case of 1<sup>st</sup> periodic verification) whether there are any open issues indicated in the validation report (e.g. FAR)?</i>	/VAL/ /unfccc/	<i>Description:</i> There are no open issues from the validation.  <i>Justification of evidences:</i> The validation report issued by TÜV SÜD on 2009-08-24 and available on the UNFCCC website has been checked.  <i>Conclusion:</i> No open issues identified.	OK	OK
<b>1.2 Open issues from previous verification</b> <b>(EB 51 Annex 3 §§ 190, 217 (g)) , 217 f</b> <i>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.</i>	/unfccc/	This is the 1 <sup>st</sup> periodic verification, hence it is not applicable	N/A	N/A
<b>1.3 Requests for Deviations / Revisions of MP</b> <b>(EB 51 Annex 3, §§ 196, 200, 211)</b> <i>Check if there have been any requests for deviations from the registered monitoring plan or requests for revisions of the monitoring plan. If any, make sure that the monitoring report reflects the application of the approved guidance from the CDM EB regarding the Rfdev. and that those issues are subject to</i>	/unfccc/ /IM01/ /AM29/ /PDD/ /PHT/	<i>Description:</i> The project is implemented and operated as per the registered PDD and MP. There is no request for deviations or revision of MP.  <i>Justification of evidences:</i> The verification team interviewed with the staff of the project,	OK	OK



Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
verification?		and cross-checked the registered PDD, MP, validation report and applied AM0029 ver 03. <i>Conclusion:</i> No Request for Deviation or Request for Revision of MP has been identified.		
<b>1.4 Initial verification</b> <i>In case an initial verification has been carried out, check if all FARs, recommendations etc. have been addressed appropriately.</i>	/IM01/	<i>Description:</i> No initial verification has been carried out.  <i>Justification of evidences:</i> N/A <i>Conclusion:</i> N/A	N/A	N/A
<b>1.5 Initial project implementation</b> <b>(EB 51 Annex 3, §§ 181 b (i), D. 1. (i) 1, – 194, 200)</b> <i>In case of first periodic verification: 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 report on the corresponding statuses and starting dates accordingly.</i>  <i>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).</i>	/IM01/ /PDD/ /AM29/ /unfccc/	<i>Description:</i> All the physical features have been checked by verification team during on-site investigation. The NGCC technology was applied which consists of two phases of combined dynamic cycles (gas cycle and steam cycle). The commenced electricity generation of #1 gas turbine is in June 2007, and the commenced electricity generation of #2 gas turbine is in December 2007. The commenced electricity generation of #1 steam turbine is in August 2007 and #2 steam turbine is in January 2008. Information of starting date provided in the monitoring report is the same as that stated in the registered PDD, which has not caused an increase in estimates of the emission reduction in current monitoring period. There are not any approvals of the request of notification or request for approval of changes from the project activity.  <i>Justification of evidences:</i>	CLP6	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>In case of further periodic verifications: Go to next chapter.</i>		By means of checking the registered PDD, the submitted MR, interview with the staff of the project, on-site observation and comparison with the applied methodology AM0029 version 3. <i>Conclusion:</i> The following CL was raised during on-site verification. CL P6 The monitoring mode w.r.t electricity meter No.3 is not consistent with the description in PDD.		
<b>2. Update on Changes and Incidents (during the Monitoring Period)</b>				
<b>2.1 Technical equipment (EB 51 Annex 3, § 186)</b>  <i>Check if relevant technical equipment of the project activity has been exchanged or modified during the monitoring period. Further ensure that consistent designations of key equipment (meters etc.) in PDD, MR and calculation spreadsheet are applied</i>  <i>Consider e.g. interviews with operational personnel, QMS records, maintenance records, instrument specifications.</i>  <i>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.</i>  <i>Also, discuss –if applicable- any approvals of the</i>	/IM01/ /TP/ /PDD/ /PHT/ /LOG/	<i>Description:</i> The technical equipment incl. type and capacity of gas, steam turbines and generators, measurement instruments, transformers etc. have not been changed and are consistent with those in registered PDD. The key equipments w.r.t monitoring plan in PDD had been checked. The electric meter No.3 has been changed during the monitoring period.  <i>Justification of evidences:</i> By means of instrument specifications check and the interview during the on-site visit, it was evidenced no change and modification were conducted. This was also crosschecked as per the plant operation log, equipments check & maintenance log and on-site observation.  <i>Conclusion:</i> No technical equipment w.r.t power generation was exchanged or modified within the monitoring period. However, the following	GL P6	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>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).</i>		CL was raised during on-site verification. CL P6  The monitoring mode w.r.t electricity meter No.3 is not consistent with the description in PDD		
<p><b>2.2 Operation modes</b> (EB 51 Annex 3, §§ 187, 194)</p> <p>Check if relevant operation modes of the project activity have been exchanged or modified during the monitoring period.</p> <p>Consider e.g. interviews with operational personnel, operation log sheets, data management system records.</p> <p>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.</p> <p>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).</p>	/IM01/ /LOG/ /O&M/ /PHT/	<p><i>Description:</i></p> <p>The operation modes such as electricity generating, electricity measurement, gas consumption etc. have not been changed.</p> <p><i>Justification of evidences:</i></p> <p>By means of interviews with the operational personnel, crosschecked as per the plant operation log, equipments check &amp; maintenance log and on-site observation, the verification team verified this.</p> <p><i>Conclusion:</i></p> <p>No relevant operation modes were exchanged within the monitoring period.</p>	OK	OK
<p><b>2.3 Incidents</b> (EB 51 Annex 3, § 186)</p> <p>Identify if there have been any significant incidents, deviant operation modes and / or downtimes of the</p>	/IM01/ /LOG/ /O&M/ /PHT/ /IAR/	<p><i>Description:</i></p> <p>No significant incidents deviant operation modes and / or downtimes of the equipment have occurred.</p> <p><i>Justification of evidences:</i></p>	OK	OK



Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>equipment?</i></p> <p><i>Consider e.g. interviews with operational personnel, operational log sheets, analysis of performance data.</i></p>		<p>It was verified through the site observation, the plant operation log check, equipments check &amp; maintenance log audit, interviews with the plant operators. This was also backed up by the data integrity check.</p> <p><i>Conclusion:</i></p> <p>Incidents during the monitoring period have not been observed.</p>		
<p><b>2.5 Personnel</b></p> <p><i>Identify, if relevant personnel w.r.t. monitoring has been exchanged?</i></p> <p><i>In case of changes, assure that the implemented monitoring procedures have not been affected.</i></p>	<p>/IM01/ /MM/ /PDD/ /LOG/ /O&amp;M/ /PHT/</p>	<p><i>Description:</i></p> <p>The person in charge of the CDM project management is Mr Chen Zhiqiang assigned as CDM Project Manager by the General Manager in PDD. The Meter Technical supervisors Li, Yubing and Liu, Zhengwei are in charge of the daily maintenance and supervising the periodic calibration for energy meters and NG flow meters. The data reader Chang, Haihong is responsible for the data monitoring and recording in the log book daily, data account Yang, Fuhua is responsible for data accounting, archiving and statistical treatment. They are remaining employed in the company compared with the registered PDD.</p> <p><i>Justification of evidences:</i></p> <p>By means of interviews with the operational personnel, the personnel employed and responsibilities are checked, In addition, the registered PDD and Monitoring Manual have been cross-checked. Monitoring Manual is comprehensible, in which the roles are clearly defined and in line with the reality.</p> <p><i>Conclusion:</i></p> <p>The responsible persons have not been exchanged during the monitoring period. However CL U1 was raised.</p>	CL U1	



Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		CL U1 By means of on-site visit, the verification team found the name of the project owner has been changed from Henan Zhongyuan Gas Power Company Ltd. to Huaneng Zhongyuan Gas Power Company Ltd. Explanation and relating documents w.r.t change of information are necessary.		
<b>2.6 Legislation</b> Find out whether relevant legislation with effect on the project activity in the host country has been changed. In any case data source shall be referenced.	/IM01/ /dna/ /mep/	<i>Description:</i> Relevant legislation incl. electricity generation and transmission, gas consumption related environmental protection laws, sectoral policies and relevant regulations were not changed. <i>Justification of evidences:</i> It was verified through consulting official governmental website and as per the local and sectoral expertise of the verification team. <i>Conclusion:</i> No relevant changes since the validation were identified.	OK	OK
<b>3. Monitoring Report – General</b>				
<b>3.1 Monitoring period</b> Check if the monitoring period is in line with a) the crediting period and/or b) previous monitoring periods?	/unfccc/ /PDD/ /MR/	<i>Description:</i> The 1 <sup>st</sup> monitoring period lasts from 2009-08-25 to 2010-02-28 Both days are included. <i>Justification of evidences:</i> EB website and registered PDD have been checked to verify this. <i>Conclusion:</i>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		Monitoring period is consistent with information on the UNFCCC website and in line with the crediting period.		
<b>3.2 Publication of the Monitoring Report</b> <b>(EB 51 Annex 3, § 174 (i))</b> <i>Check if the monitoring report has been made publicly available on the UNFCCC website before the verification commenced.</i>	/unfccc/	<i>Description:</i> The publication of the monitoring report has been made on 2009-03-09, while the on-site verification has been carried out on 2010-03-24 and 2010-03-26; therefore it is two weeks prior to the start of the verification activities. <i>Justification of evidences:</i> UNFCCC website has been checked. The database is providing information about the status of the monitoring report. <i>Conclusion:</i> The draft monitoring report, as received from the project participants, has been made publicly available prior to the start of the verification activities.	OK	OK
<b>3.3 References</b> <i>Check if the monitoring report provides the correct references, in detail: project title, UNFCCC registration No., applied methodology/ies, meth tools.</i>	/MR/ /unfccc/	<i>Description:</i> The project title is "Zhumadian Zhongyuan Gas-Steam Combined Cycle Power Project in Henan China". UNFCCC reg. No. is 2344. Applied methodology is AM0029 version 3. All these references were provided in MR. However, the CL R1 was raised. CL R1 In the monitoring report, the monitoring methodology and methodology tools applied by the project should be specified. <i>Justification of evidences:</i> The references listed in MR were verified according to the registered PDD and related info which is published on UNFCCC	GLR4	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		website was checked as correct. However, the MR does not provide the full list of the applied methodologies and CL R1 was raised.  <i>Conclusion:</i> The CL R1 was raised.		
<b>3.4 Completeness</b> <b>(EB 51 Annex 3, §§ 181, 194, 201 (b), 205)</b> <i>Assess if the monitoring report is complete, i.e. have all relevant issues been addressed? The MR shall include: (i) The implementation status of the project during the monitoring period (ii) Monitoring systems and procedures incl. QA/QC system employed (iii) all parameters to be monitored and reported at the intervals required by the MP and the Meth (iv) information on calibration of monitoring instruments (v) Emission factors, IPCC default values etc. (vi) reference to any deviation request approved by the EB, (vii) calculation of ER including reference to formulae and methods used (viii) comparison of the actual ER claimed in the MP with the estimate in the registered PDD and explanation in case of significant increase.</i>	/MR/	No, not all relevant issues are covered; in detail: <input checked="" type="checkbox"/> (i) Implementation status CAR R2 As per EB 48, Annex 68 paragraph 10, the implementation status of the project during the monitoring period under consideration is described insufficiently in MR. Revision is necessary. <input checked="" type="checkbox"/> (ii) Monitoring systems and procedures (esp. QA/QC) <input checked="" type="checkbox"/> (iii) All parameters and corresponding intervals <input type="checkbox"/> (iv) Information on calibration of monitoring instruments CAR R3 Information on calibration frequency of monitoring instruments including gas flow meters and gas chromatography should be provided in monitoring report, according to EB48 Annex 68 paragraph 10. Revision is necessary. <input checked="" type="checkbox"/> (v) Emission factors, IPCC default values etc. <input type="checkbox"/> (vi) Reference to deviations, if applicable It is not necessary to make any deviation, hence it is not applicable <input checked="" type="checkbox"/> (vii) Calculation of emission reductions	CAR R2 CAR R3 CAR R4	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<input type="checkbox"/> (viii) Comparison of ER with PDD estimation CAR R4 As per EB 48, Annex 68 paragraph 10, information on “Comparison of the actual emission reduction claimed in the monitoring period with the estimate in the registered PDD, and explanation on any significant increase.” should be provided in monitoring report. Revision is necessary.		
<b>3.5 Comparison of estimated and actual ER</b> <b>(EB 51 Annex 3, § 194 c)</b> <i>Have differences between the monitored ER and the ex-ante ER been reported and appropriately justified? Please assess potential impacts on baseline and additionality.</i>	/IM01/ /MR/	<i>Description:</i> A comparison of the electricity generated within the monitoring period and the comparable period based on PDD data has been conducted. During the monitoring period (2009-08-25 to 2010-02-28) the supplied power from the project to the grid is 720,909 MWh, the average daily supplied electricity is 3834.6 MWh/day (PLF is 0.212), which is 45.84% lower than the estimated in registered PDD 7080.6 MWh/day (2,584,423.5MWh annually, PLF is 0.391). However, CAR R4 was raised above. <i>Justification of evidences:</i> The emission reduction calculation has been checked which is assessed as correct. The registered PDD has been crosschecked <i>Conclusion:</i> The CAR R4 was raised.	CAR R4	OK
<b>3.6 Transparency</b> <i>Assess if the monitoring report is transparent, i.e.</i>	/MR/ /DMR/	<i>Description:</i> The description of monitoring data, ER calculation and monitoring procedures etc. in monitoring report is based on	GL-R5	OK



Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>clear and unequivocal in all respect?</i>	/INO/ /MMR/ /XLS/	actual operation and measurement and data source are clearly provided. The ER calculation is accurate and the related information is described in MR.  <i>Justification of evidences:</i> The relevant documents incl. electricity invoices, summary and daily meter reading records, meter calibration records etc. have been checked to be reliable.  <i>Conclusion:</i> The monitoring report is clear and unequivocal in all respect. However, the CL R5 was raised. CL R5 The transparent calculation process for $EF_{BL,upstream,CH4}$ should be provided.		
<b>3.7 Misstatements on general issues</b>  <i>Assess whether the monitoring report is free of material misstatements regarding issues other than the monitoring parameters.</i>  <i>Discuss the monitoring parameters in detail in chapter "Monitoring Parameters".</i>	/MR/ /PDD/	<i>Description:</i> The monitoring report reflects the real situation/ characteristics of the project.  <i>Justification of evidences:</i> the monitoring report, the validated monitoring plan and the relevant documents have been checked.  <i>Conclusion:</i> No material misstatement was detected.	OK	OK
<b>3.8 Deviations from the validated monitoring plan (EB 51 Annex 3, §187)</b>  <i>Assess whether the MR is in line with the validated monitoring plan?</i>  <i>In case of intended changes: Have they been</i>	/MR/ /PDD/	<i>Description:</i> In general the monitoring report is in line with the validated monitoring plan contained in the registered PDD. However, it has been observed that the back-up gas flow meters are different to those in the PDD. Hence, FAR P2 has been raised.	FAR P2	FAR P2

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>approved by the UNFCCC?</i>		<p><i>Justification of evidences:</i></p> <p>The monitoring report and the registered PDD have been checked and on-site visit was conducted.</p> <p><i>Conclusion:</i></p> <p>The type of backup gas flow meters (No.3, No.4, No.5, No.6) and installed location of the backup gas flow meter (No.4, No.6) are inconsistent with the description in PDD.</p>		
<b>3.9 Deviations from the approved methodology (EB 51 Annex 3, §§ 187, 195, 196)</b>  <i>Assess whether the MR in line with the applied monitoring methodology?</i>	/MR/	<p><i>Description:</i></p> <p>The MR is in line with the applied monitoring methodology AM0029 ver.03.</p> <p><i>Justification of evidences:</i></p> <p>The monitoring section of the methodology has been checked to confirm that all aspects of the methodology are covered with the monitoring report.</p> <p><i>Conclusion:</i></p> <p>No deviations from the approved methodology have been identified.</p>	OK	OK
<b>4. Monitoring Parameters</b> <i>(List all parameters of the PDD chapter B.7.1; pl. copy the 6 lines below for each parameter)</i>				
<b>4.1. FC<sub>NG,y</sub></b>		<b>Description:</b> Quantity of natural gas consumed in project activity		
<b>a) Measurement / Determination method</b>	/IM01/ /PDD/	<i>Description:</i>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><b>(EB 51 Annex 3, §§ 183, 184, 201 (c), 202)</b></p> <p><i>Describe how the monitoring parameter was measured / determined.</i></p> <p><i>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.</i></p> <p><i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>	/AM29/ /DMR/ /MMR/ /INO/	<p>FC<sub>NG,y</sub> is determined as annual quantity of natural gas consumed in project activity.</p> <p>The natural gas consumed in project activity was measured continuously by the Gas Flow Meter No.1 and Meter No.2 with accuracy 1.0S and recorded daily, one of which is for backup (Meter No.2). The meters are located in front of the natural gas delivery point.</p> <p>No meters exchanges and malfunction were detected during the monitoring period.</p> <p><i>Justification of evidences:</i></p> <p>The daily and monthly meter reading records were verified by the verification team and cross checked by the monthly gas purchasing invoices.</p> <p>The accuracy of meters was verified through viewing of the real meter and cross checked with the meter calibration report. The characteristics including serial number, type, and accuracy of the meter are consistent with those described in validated MP.</p> <p><i>Conclusion:</i></p> <p>No failures / downtimes of standard equipment were observed during the monitoring period, thus no deviant measurement / determination methods were applied. The measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</p>		
<p><b>b) Correctness</b></p> <p><b>(EB 51 Annex 3, §§ 201 (b), 202, 205 (d))</b></p>	/MR/ /DMR/ /MMR/	<input type="checkbox"/> Correct <input checked="" type="checkbox"/> Not correct <i>Description:</i>	GLP4	OK





Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>Determine whether the value given in the monitoring report is correct and sufficiently justified.</i></p> <p><i>In case of mistakes pl. provide details and descriptions of the CARs raised.</i></p>	/INO/ /XLS/	<p>The natural gas consumed in the project is measured by Gas Flow Meter No.1 and Gas Flow Meter No.2 from 2009-08-25 to 2010-02-28 was provided in MR. Natural gas purchasing invoices were available for the verification team.</p> <p><i>Justification of evidences:</i></p> <p>The daily and monthly meter reading records were checked and compared with natural gas purchasing invoices and meter reading records of backup meter.</p> <p><i>Conclusion:</i></p> <p>CL P1</p> <p>The value of monthly gas consumption in emission reduction calculation sheet is not consistent with the recorded data.</p>		
<p><b>c) QA/QC Procedure</b> <b>(EB 51 Annex 3, §§ 181, 204 (c), 205)</b></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration and maintenance of the monitoring equipment has been carried out by competent personnel.</i></p>	/CAL2/ /MM/ /MMR/ /IM01/	<p><i>Description:</i></p> <p>The accuracy of Gas Flow Meter No.1 and Gas Flow Meter No.2 is 1.0s and meets the requirement of the applied national standard.</p> <p>Backup Meter3, Meter4, Meter5 and Meter 6 were installed at project site. In case of Meter No.1 and Meter No.2 both failures.</p> <p>All the main meters and the backup meters calibrations were performed yearly by a qualified third party and in line with the industry requirement.</p> <p><i>Justification of evidences:</i></p> <p>The meters calibration records regarding the main meters and the backup meters covering the monitoring period were available during the verification, and checked to be credible. The</p>	FAR P2	FAR P2



Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p>qualification certificate of calibration entity was verified. All the meters are in normal operational condition during this monitoring period. No error has occurred.</p> <p><i>Conclusion:</i></p> <p>QA/QC procedures for main meters are in line with the MP and the calibration and maintenance of the monitoring equipment have been carried out appropriately. However, FAR P2 was raised follow.</p> <p>FAR P2</p> <p>During the 1<sup>st</sup> monitoring period, the main gas flow meters No.1 and No.2 have been operated properly without abnormal situation. The record data from gas meter No.1 and No.2 has been used for emission reduction calculation. However, the type of backup gas flow meter (No.3, No.4, No.5, No.6) and installed location of the backup gas flow meter (No.4, No.6) are inconsistent with the description in PDD. This will be addressed during the 2<sup>nd</sup> verification.</p>		
<p><b>d) Accuracy</b></p> <p><b>(EB 51 Annex 3, §§204 (c), 202, 205(a))</b></p> <p><i>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.</i></p>	/CAL/ /MM/	<p><i>Description:</i></p> <p>The natural gas consumed in the project was measured by the Gas Flow Meter No.1 and Meter No.2 continuously with accuracy 1.0S and recorded daily.</p> <p>The main meter calibrations were performed yearly by a qualified third party and in line with the industry requirement.</p> <p><i>Justification of evidences:</i></p> <p>The accuracy of meter No.1 and No.2 is 1.0S and meet the applied national standard (GB/T 18603-2001). The measured</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p>value was crosschecked by the monthly NG purchasing invoices.</p> <p>The meters calibration records regarding the main meter and the backup meter covering the monitoring period were available during the verification, and checked to be credible. All the meters are in normal operational condition during this monitoring period.</p> <p><i>Conclusion:</i></p> <p>No inaccuracies occurred during the monitoring period.</p>		
<p><b>e) Verification</b></p> <p><b>(EB 51 Annex 3, §§ 183 (a), 183 (b), 185, 202, 204, 205(b))</b></p> <p><i>Describe how the information flow (from data generation, aggregation, to recording, calculation and reporting) for these parameters including the value was verified. Consider the measurement / determination procedure, accuracies, QA/QC procedures. Consider as well plausibility checks as far as possible. Check if the applied value could be backed up by corresponding evidences (external / internal, oral or documented). Further whether sufficient evidence is available, both in terms of frequency (time period between evidence) and in covering the full monitoring period.</i></p>	<p>/IM01/ /MM/ /DMR/ /MMR/ /INO/</p>	<p><i>Description:</i></p> <p>The value of NG consumption was verified and cross checked through the monthly invoices.</p> <p><i>Justification of evidences:</i></p> <p>During the on-site visit the operation of installed meters have been observed. For purpose of plausibility check meter readings and photos of the installed equipment have been taken. The flow computer in the premises of the gas supplier has been visited and checked. The invoices of the gas supplier were counter-checked against manual readings and flow values measured with the meter owned by the operator. The recorded data and monthly invoices are cross-checked and assessed to be reliable.</p> <p>Measured values are counterchecked on the basis of electricity production figures and heat rate / efficiency estimations.</p> <p>The emission reductions were re-produced by the verification team using of monthly invoices and gas balance sheet approved</p>	OK	OK



Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		by gas supplier. <i>Conclusion:</i> The value was verified based on the measurement procedure, accuracies, QA/QC procedures and other related sufficient evidences.		
<b>4.2. NCV<sub>NG,y</sub></b>		<b>Description:</b> Net Calorific Value of the NG		
<b>a) Measurement / Determination method</b> <b>(EB 51 Annex 3, §§ 183, 184, 201 (c), 202)</b> <i>Describe how the monitoring parameter was measured / determined.</i> <i>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.</i> <i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i>	/IM01/ /PDD/ /AM29/ /DMR/ /MMR/ /INO/	<i>Description:</i> The NCV of the natural gas is determined from the results of a gas chromatography analyzer (GC) measurement upstream of the plant. The value is measured by the gas supplier (Petro China Company Ltd.) and the NCV values were recorded every ten days and submitted by the gas supplier. The GC on site is manufactured by ABB, Type BTU-8000. This GC is operated on a continuous basis. No device exchanges and malfunction were detected during the monitoring period.  <i>Justification of evidences:</i> It has been confirmed by the gas supplier Petrol China Company Ltd. that the value and calculation is reliable and correct. The confirmation has been checked by verification team. The accuracy of GS was verified through the GS calibration report. The characteristics including measuring conditions and accuracy of the meter are consistent with those described in validated MP.  <i>Conclusion:</i> No failures / downtimes of standard equipment were observed	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		during the monitoring period, thus no deviant measurement / determination methods were applied. The measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.		
<b>b) Correctness</b> <b>(EB 51 Annex 3, §§ 201 (b), 202, 205 (d))</b>  <i>Determine whether the value given in the monitoring report is correct and sufficiently justified.</i>  <i>In case of mistakes pl. provide details and descriptions of the CARs raised.</i>	/MR/ /DMR/ /MMR/ /INO/ /XLS/	<input type="checkbox"/> Correct <input checked="" type="checkbox"/> Not correct  <i>Description:</i> The NCV value is measured by the gas chromatography analyzer from 2009-08-25 to 2010-02-28 as provided in MR.  <i>Justification of evidences:</i> The NCV reading records provided by the gas supplier were assessed to be reliable. The value given in the monitoring report and the corresponding Excel sheet were checked. <i>Conclusion:</i> CL P3 The value of NCV <sub>NG,y</sub> in parameter description of monitoring report is inconsistent with the recorded data. Revision is necessary. CL P4 The frequency of the recording of NCV value is not consistent with the description in MR. In addition, the frequency should be justified to demonstrate the monitored NCV value is representative.	CL P3 CL P4	OK
<b>c) QA/QC Procedure</b> <b>(EB 51 Annex 3, §§ 181, 204 (c), 205)</b>  <i>Describe whether all applicable QA/QC procedures</i>	/CAL3/ /MM/	<i>Description:</i> The QA/QC procedure is in line with the requirements of the PDD, AM0029 and the applied national standard. The GC is	OK	OK



Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>are met. Assess further if the calibration and maintenance of the monitoring equipment has been carried out by competent personnel.</i>		calibrated yearly by the qualified third party.  <i>Justification of evidences:</i> The GC calibration records covering the monitoring period were available during the verification, and checked to be credible. The qualification certificate of calibration entity was verified. The GC is in normal operational condition during this monitoring period. No error has occurred.  <i>Conclusion:</i> QA/QC procedures are in line with the MP and the calibration and maintenance of the monitoring equipment have been carried out appropriately.		
<b>d) Accuracy</b> <b>(EB 51 Annex 3, §§204 (c), 202, 205(a))</b>  <i>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.</i>	/CAL3/ /MM/	<i>Description:</i> The NCV value in the project was measured by GC continuously  The GC calibrations were performed yearly by a qualified third party and in line with the industry requirement.  <i>Justification of evidences:</i> 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 verification, and checked to be credible.  <i>Conclusion:</i> No significant inaccuracies have been identified for this parameter.	OK	OK
<b>e) Verification</b> <b>(EB 51 Annex 3, §§ 183 (a), 183 (b), 185, 202, 204,</b>	/IM01/ /MM/ /DMR/	<i>Description:</i> The NCV value was measured by China Petroleum West-East	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<b>205(b))</b> Describe how the information flow (from data generation, aggregation, to recording, calculation and reporting) for these parameters including the value was verified. Consider the measurement / determination procedure, accuracies, QA/QC procedures. Consider as well plausibility checks as far as possible. Check if the applied value could be backed up by corresponding evidences (external / internal, oral or documented). Further whether sufficient evidence is available, both in terms of frequency (time period between evidence) and in covering the full monitoring period.	/MMR/ /INO/	Gas Transfer Pipeline Company Henan Province Xuedian Branch Station every ten days and reported to project owner. The measurement procedure fully complies with the national standards. <i>Justification of evidences:</i> The verification team has checked the calibration report for GS. The value was verified based on the measurement procedure, accuracies, QA/QC procedures. The NCV value was also confirmed by gas supplier. <i>Conclusion:</i> All listed NCVs were measured within the range of expectations.		
<b>4.3. OXID<sub>i</sub></b>		<b>Description:</b> Oxidation factor for the fuel i		
<b>a) Measurement / Determination method</b> <b>(EB 51 Annex 3, §§ 183, 184, 201 (c), 202)</b> 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.	/PDD/ /AM29/ /ipcc/	<i>Description:</i> The oxidation factor has to be derived from the latest IPCC values. <i>Justification of evidences:</i> The latest 2006 IPCC values have been checked. <i>Conclusion:</i> The measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.	OK	OK



Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<b>b) Correctness</b> <b>(EB 51 Annex 3, §§ 201 (b), 202, 205 (d))</b>  <i>Determine whether the value given in the monitoring report is correct and sufficiently justified.</i>  <i>In case of mistakes pl. provide details and descriptions of the CARs raised.</i>	/MR/ /ipcc/ /XLS/	<input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct  <i>Description:</i> The 2006 value for OXID <sub>i</sub> (i.e. 1.0) has been used.  <i>Justification of evidences:</i> The latest 2006 IPPC values have been checked though the IPCC official website, which is assessed to be reliable.  <i>Conclusion:</i> The value given in the monitoring report is correct.	OK	OK
<b>c) QA/QC Procedure</b> <b>(EB 51 Annex 3, §§ 181, 204 (c), 205)</b>  <i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration and maintenance of the monitoring equipment has been carried out by competent personnel.</i>	/ipcc/ /MM/	<i>Description:</i> Not required as per methodology.  <i>Justification of evidences:</i> N/A  <i>Conclusion:</i> N/A	N/A	N/A
<b>d) Accuracy</b> <b>(EB 51 Annex 3, §§204 (c), 202, 205(a))</b>  <i>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.</i>	/ipcc/ /MM/	<i>Description:</i> N/A  <i>Justification of evidences:</i> N/A  <i>Conclusion:</i> N/A	N/A	N/A

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<b>e) Verification</b> <b>(EB 51 Annex 3, §§ 183 (a), 183 (b), 185, 202, 204, 205(b))</b> Describe how the information flow (from data generation, aggregation, to recording, calculation and reporting) for these parameters including the value was verified. Consider the measurement / determination procedure, accuracies, QA/QC procedures. Consider as well plausibility checks as far as possible. Check if the applied value could be backed up by corresponding evidences (external / internal, oral or documented). Further whether sufficient evidence is available, both in terms of frequency (time period between evidence) and in covering the full monitoring period.	/IM01/ /PDD/ /AM29/ /MR/ /ipcc/	<i>Description:</i> The most recent 2006 IPCC standard values for oxidation factors have been checked. <i>Justification of evidences:</i> The latest 2006 IPCC values have been checked though the IPCC official website, which is assessed to be reliable. <i>Conclusion:</i> The value was verified based on 2006 IPCC values.	OK	OK
<b>4.4. EF<sub>CO2,NG,y</sub></b>		<b>Description:</b> Emission factor for NG consumed in the project activity		
<b>a) Measurement / Determination method</b> <b>(EB 51 Annex 3, §§ 183, 184, 201 (c), 202)</b> 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	/IM01/ /PDD/ /AM29/	<i>Description:</i> The value is determined by National data which is cited from 2006 IPCC Guidelines <i>Justification of evidences:</i> The National and IPCC data has also been checked. The gas composition data provided by gas supplier has been check to be reliable. <i>Conclusion:</i> CAR P5 Though the chosen value for the parameter EF <sub>CO2, NG,y</sub> is in line	CAR P5	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>method is in line with the registered monitoring plan of the PDD and the applied methodology.</i>		with the monitoring plan as set out in the PDD, as per AM0029 Ver. 3 p.12., it should use supplier-provided data, local data, country-specific values, that order of preference.		
<b>b) Correctness</b> <b>(EB 51 Annex 3, §§ 201 (b), 202, 205 (d))</b>  <i>Determine whether the value given in the monitoring report is correct and sufficiently justified.</i>  <i>In case of mistakes pl. provide details and descriptions of the CARs raised.</i>	/ MR/ / DMR/ / MMR/ / INO/ / XLS/	<input type="checkbox"/> Correct <input checked="" type="checkbox"/> Not correct  <i>Description:</i> Please refer to CAR P5  <i>Justification of evidences:</i> <i>Conclusion:</i>	CAR P5	OK
<b>c) QA/QC Procedure</b> <b>(EB 51 Annex 3, §§ 181, 204 (c), 205)</b>  <i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration and maintenance of the monitoring equipment has been carried out by competent personnel.</i>	/ CAL2/ / MM/	<i>Description:</i> Not necessary as per methodology  <i>Justification of evidences:</i> <i>Conclusion:</i>	N/A	N/A
<b>d) Accuracy</b> <b>(EB 51 Annex 3, §§204 (c), 202, 205(a))</b>  <i>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.</i>	/ CAL2/ / MM/	<i>Description:</i> Please refer to CAR P5  <i>Justification of evidences:</i> <i>Conclusion:</i>	CAR P5	OK
<b>e) Verification</b>	/IM01/	<i>Description:</i>	CAR	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<b>(EB 51 Annex 3, §§ 183 (a), 183 (b), 185, 202, 204, 205(b))</b> Describe how the information flow (from data generation, aggregation, to recording, calculation and reporting) for these parameters including the value was verified. Consider the measurement / determination procedure, accuracies, QA/QC procedures. Consider as well plausibility checks as far as possible. Check if the applied value could be backed up by corresponding evidences (external / internal, oral or documented). Further whether sufficient evidence is available, both in terms of frequency (time period between evidence) and in covering the full monitoring period.	/MM/ /DMR/ /MMR/ /INO/	Please refer to CAR P5  Justification of evidences: Conclusion:	P5	
<b>4.5. COEF<sub>NG,y</sub></b>		<b>Description:</b> CO <sub>2</sub> emission coefficient in year y for natural gas.		
<b>a) Measurement / Determination method</b> <b>(EB 51 Annex 3, §§ 183, 184, 201 (c), 202)</b> 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	/IM01/ /PDD/ /AM29/ /DMR/ /MMR/ /INO/	<b>Description:</b> $COEF_{NG,y} = NCV_{NG,y} \times EF_{CO_2,NG,y} \times OXID_{NG}$ The coefficient is the product from the monitored values net calorific value, emission factor and oxidation,  <b>Justification of evidences:</b> The methodology and the registered PDD have been checked to confirm the correctness. However, even is the approach is correct CAR P5 needs to be closed out first before a final conclusion can be provided.  <b>Conclusion:</b> CAR P5	CAR P5	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>of the PDD and the applied methodology.</i>				
<b>b) Correctness</b> <b>(EB 51 Annex 3, §§ 201 (b), 202, 205 (d))</b>  <i>Determine whether the value given in the monitoring report is correct and sufficiently justified.</i>  <i>In case of mistakes pl. provide details and descriptions of the CARs raised.</i>	/MR/ /DMR/ /MMR/ /INO/ /XLS/	<input type="checkbox"/> Correct <input checked="" type="checkbox"/> Not correct  <i>Description:</i> Please refer to CAR P5  <i>Justification of evidences:</i> <i>Conclusion:</i>	CAR P5	OK
<b>c) QA/QC Procedure</b> <b>(EB 51 Annex 3, §§ 181, 204 (c), 205)</b>  <i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration and maintenance of the monitoring equipment has been carried out by competent personnel.</i>	/CAL/ /MM/	<i>Description:</i> As per the methodology QA/QC procedures are not necessary.  <i>Justification of evidences:</i> N/A  <i>Conclusion:</i> N/A	N/A	N/A
<b>d) Accuracy</b> <b>(EB 51 Annex 3, §§204 (c), 202, 205(a))</b>  <i>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.</i>	/CAL/ /MM/	<i>Description:</i> N/A  <i>Justification of evidences:</i> N/A  <i>Conclusion:</i> N/A	N/A	N/A

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<b>e) Verification</b> <b>(EB 51 Annex 3, §§ 183 (a), 183 (b), 185, 202, 204, 205(b))</b> Describe how the information flow (from data generation, aggregation, to recording, calculation and reporting) for these parameters including the value was verified. Consider the measurement / determination procedure, accuracies, QA/QC procedures. Consider as well plausibility checks as far as possible. Check if the applied value could be backed up by corresponding evidences (external / internal, oral or documented). Further whether sufficient evidence is available, both in terms of frequency (time period between evidence) and in covering the full monitoring period.	/IM01/ /MM/ /DMR/ /MMR/ /INO/	Description: N/A Justification of evidences: N/A Conclusion: N/A	N/A	N/A
<b>4.6. PE<sub>y</sub></b>		<b>Description:</b> CO <sub>2</sub> emissions from the power plant of the project due to combustion of natural gas fuel in y year.		
<b>a) Measurement / Determination method</b> <b>(EB 51 Annex 3, §§ 183, 184, 201 (c), 202)</b> 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	/IM01/ /PDD/ /AM29/ /DMR/ /MMR/ /INO/	Description: $PE_y = FC_{NG,y} \times COEF_{NG,y}$ Please refer to CAR P5 Justification of evidences: Conclusion:	CAR P5	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>method is in line with the registered monitoring plan of the PDD and the applied methodology.</i>				
<b>b) Correctness</b> <b>(EB 51 Annex 3, §§ 201 (b), 202, 205 (d))</b>  <i>Determine whether the value given in the monitoring report is correct and sufficiently justified.</i>  <i>In case of mistakes pl. provide details and descriptions of the CARs raised.</i>	/MR/ /DMR/ /MMR/ /INO/ /XLS/	<input type="checkbox"/> Correct <input checked="" type="checkbox"/> Not correct  <i>Description:</i> Please refer to CAR P5  <i>Justification of evidences:</i> <i>Conclusion:</i>	CAR P5	OK
<b>c) QA/QC Procedure</b> <b>(EB 51 Annex 3, §§ 181, 204 (c), 205)</b>  <i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration and maintenance of the monitoring equipment has been carried out by competent personnel.</i>	/CAL/ /MM/	<i>Description:</i> N/A  <i>Justification of evidences:</i> N/A  <i>Conclusion:</i> N/A	N/A	N/A
<b>d) Accuracy</b> <b>(EB 51 Annex 3, §§204 (c), 202, 205(a))</b>  <i>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</i>	/CAL/ /MM/	<i>Description:</i> N/A  <i>Justification of evidences:</i> N/A  <i>Conclusion:</i> N/A	N/A	N/A



Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>been made for calculating ERs.</i>				
<b>e) Verification</b> <b>(EB 51 Annex 3, §§ 183 (a), 183 (b), 185, 202, 204, 205(b))</b> <i>Describe how the information flow (from data generation, aggregation, to recording, calculation and reporting) for these parameters including the value was verified. Consider the measurement / determination procedure, accuracies, QA/QC procedures. Consider as well plausibility checks as far as possible. Check if the applied value could be backed up by corresponding evidences (external / internal, oral or documented). Further whether sufficient evidence is available, both in terms of frequency (time period between evidence) and in covering the full monitoring period.</i>	/IM01/ /MM/ /DMR/ /MMR/ /INO/	<i>Description:</i> N/A  <i>Justification of evidences:</i> N/A  <i>Conclusion:</i> N/A	N/A	N/A
<b>4.7. EG<sub>net,pj,y</sub></b>		<b>Description:</b> The actual annual net electricity delivered by the project activity		
<b>a) Measurement / Determination method</b> <b>(EB 51 Annex 3, §§ 183, 184, 201 (c), 202)</b> <i>Describe how the monitoring parameter was measured / determined.</i>  <i>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.</i>	/IM01/ /PDD/ /AM29/ /DMR/ /MMR/ /INO/	<i>Description:</i> Four meters are involved in metering of the electricity exported to the grid and imported from the grid. All meters are listed in Table 5-1. The Meter No.1 and Meter No.2 are located at 500kV main substation. The bidirectional meters are set up, one is the primary meter and another is the backup one. In case the meter No.1 is detected in fault, the backup meter No.2 will replace the No.1 for billing. During this monitoring period, there is no malfunction detected for meter No.1, therefore meter No.1 is used as invoice meter and meter No.2 is a back-up meter.	CAR P6	OK



Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.		<p>Neither meter no. 1 nor meter no. 2 have been exchanged.</p> <p>Meter No.3 is located at project site on 110kV line, which is used to measure the amount of electricity imported from the grid in case the electricity is needed for starting up the power units.</p> <p>Nevertheless regular manual readings are taken. They are the basis for the invoice which is raised on a monthly basis to the grid company.</p> <p><i>Justification of evidences:</i></p> <p>The daily and monthly meter reading records were verified by the verification team and cross checked by the monthly gas purchasing invoices.</p> <p><i>Conclusion:</i></p> <p>The measurement method of Meter No.1 and Meter No.2 is in line with the registered monitoring plan of PDD and applied methodology AM0029, Ver.03.</p> <p>CAR P6</p> <p>The monitoring mode w.r.t electricity meter No.3 is not consistent with the description in PDD.</p>		
<p><b>b) Correctness</b></p> <p><b>(EB 51 Annex 3, §§ 201 (b), 202, 205 (d))</b></p> <p>Determine whether the value given in the monitoring report is correct and sufficiently justified.</p> <p>In case of mistakes pl. provide details and descriptions of the CARs raised.</p>	<p>/MR/ /DMR/ /MMR/ /INO/ /XLS/</p>	<p><input type="checkbox"/> Correct      <input checked="" type="checkbox"/> Not correct</p> <p><i>Description:</i></p> <p>The electricity supplied to the grid and imported from grid was not correct.</p> <p><i>Justification of evidences:</i></p> <p>The daily and monthly meter reading records were checked and compared with the electricity invoices and power balance sheet</p>	CAR P6	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		which were approved by grid company. <i>Conclusion:</i> CAR P6 was raised above.		
<b>c) QA/QC Procedure</b> <b>(EB 51 Annex 3, §§ 181, 204 (c), 205)</b> <i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration and maintenance of the monitoring equipment has been carried out by competent personnel.</i>	/CAL/ /MM/	<i>Description:</i> Meter No.1 and Meter No.2 calibrations were performed quarterly by a qualified third party and in line with the industry requirement.  Please refer to CAR P6 for Meter No.3.  <i>Justification of evidences:</i> The meters calibration records regarding the main meter and the backup meter covering the monitoring period were available during the verification, and checked to be credible. The qualification certificate of calibration entity was verified. All the meters are in normal operational condition during this monitoring period. No error has occurred.  <i>Conclusion:</i> QA/QC procedures for Meter No.1 and Meter No.2 are in line with the MP and the calibration and maintenance of the monitoring equipment have been carried out appropriately.  However, CAR P6 was raised above.	CAR P6	OK
<b>d) Accuracy</b> <b>(EB 51 Annex 3, §§204 (c), 202, 205(a))</b> <i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance</i>	/CAL/ /MM/	<i>Description:</i> The exported and imported electricity were measured by meter No.1 and Meter No.2 continuously with accuracy 0.2S and recorded monthly.  All the main meters and the backup meters calibrations were	CAR P6	OK



Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
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.		<p>performed quarterly by a qualified third party and in line with the industry requirement.</p> <p>Please refer to CAR P6 for Meter No.3.</p> <p><i>Justification of evidences:</i></p> <p>The accuracy of Meter No.1 and Meter No.2 is 0.2 S met with the applied national standard (DL/T 448 2000). The measured value was crosschecked by the monthly power sales and purchasing invoices.</p> <p>The meters calibration records regarding the main meters and the backup meters covering the monitoring period were available during the verification, and checked to be credible. All the meters are in normal operational condition during this monitoring period.</p> <p><i>Conclusion:</i></p> <p>No inaccuracies occurred during the monitoring period for Meter No.1 and Meter No.2.</p> <p>However, CAR P6 was raised above.</p>		
<p><b>e) Verification</b></p> <p><b>(EB 51 Annex 3, §§ 183 (a), 183 (b), 185, 202, 204, 205(b))</b></p> <p>Describe how the information flow (from data generation, aggregation, to recording, calculation and reporting) for these parameters including the value was verified. Consider the measurement / determination procedure, accuracies, QA/QC procedures. Consider as well plausibility checks as</p>	/IM01/ /MM/ /DMR/ /MMR/ /INO/	<p><i>Description:</i></p> <p>The values of imported and exported electricity were verified and cross checked through the monthly invoices.</p> <p>Please refer to CAR P6 for values from Meter No.3</p> <p><i>Justification of evidences:</i></p> <p>The emission reductions were re-produced by the verification team using of monthly invoices and electricity balance sheet approved by grid company.</p>	CAR P6	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>far as possible. Check if the applied value could be backed up by corresponding evidences (external / internal, oral or documented). Further whether sufficient evidence is available, both in terms of frequency (time period between evidence) and in covering the full monitoring period.</i>		The recorded data, monthly invoices and electricity balance sheet confirmed by grid company are cross-checked and assessed to be reliable.  <i>Conclusion:</i>  The value for Meter No.1 and Meter No.2 was verified based on the measurement procedure, accuracies, QA/QC procedures and other related sufficient evidences. However, CAR P6 was raised above.		
<b>4.8. <math>EF_{grid,BM,y}</math></b>		<b>Description:</b> Build marginal emission factor of the CCPG during the project operation period		
<b>a) Measurement / Determination method</b> <b>(EB 51 Annex 3, §§ 183, 184, 201 (c), 202)</b> <i>Describe how the monitoring parameter was measured / determined.</i>  <i>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.</i>  <i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i>	/PDD/ /AM29/ /dna-HP/	<i>Description:</i> 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 the DNA website at the time of verification will be used.  <i>Justification of evidences:</i> The latest value available at the DNA website (2009 baseline emission factors for regional power grids in China issued by China's DNA on 02/07/2009) has been checked.  <i>Conclusion:</i> CAR P7  Formulae applied to calculate $EF_{grid,BM,y}$ is not completely provided in the MR. Parameters indicated in the monitoring section are addressed which are missing in the theoretical approach to calculate the ER. Revision is necessary.	CAR P7	OK
<b>b) Correctness</b>	/MR/ /DMR/	<input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<b>(EB 51 Annex 3, §§ 201 (b), 202, 205 (d))</b>  <i>Determine whether the value given in the monitoring report is correct and sufficiently justified.</i>  <i>In case of mistakes pl. provide details and descriptions of the CARs raised.</i>	/MMR/ /INO/ /XLS/	<i>Description:</i> The latest value available at the DNA is 0.5802  <i>Justification of evidences:</i> The latest value available at the DNA website (2009 baseline emission factors for regional power grids in China issued by China's DNA on 02/07/2009) has been checked.  <i>Conclusion:</i> The value given in the monitoring report is correct.		
<b>c) QA/QC Procedure</b> <b>(EB 51 Annex 3, §§ 181, 204 (c), 205)</b>  <i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration and maintenance of the monitoring equipment has been carried out by competent personnel.</i>	/CAL/ /MM/	<i>Description:</i> N/A  <i>Justification of evidences:</i> N/A  <i>Conclusion:</i> N/A	N/A	N/A
<b>d) Accuracy</b> <b>(EB 51 Annex 3, §§204 (c), 202, 205(a))</b>  <i>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.</i>	/CAL/ /MM/	<i>Description:</i> N/A  <i>Justification of evidences:</i> N/A  <i>Conclusion:</i> N/A	N/A	N/A

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<b>e) Verification</b> <b>(EB 51 Annex 3, §§ 183 (a), 183 (b), 185, 202, 204, 205(b))</b> Describe how the information flow (from data generation, aggregation, to recording, calculation and reporting) for these parameters including the value was verified. Consider the measurement / determination procedure, accuracies, QA/QC procedures. Consider as well plausibility checks as far as possible. Check if the applied value could be backed up by corresponding evidences (external / internal, oral or documented). Further whether sufficient evidence is available, both in terms of frequency (time period between evidence) and in covering the full monitoring period.	/IM01/ /MM/ /DMR/ /MMR/ /INO/	Description: N/A Justification of evidences: N/A Conclusion: N/A	N/A	N/A
<b>5. ER Calculation</b>				
<b>5.1 Traceability</b> <b>(EB 51 Annex 3, §181)</b> Assess if the calculation is fully traceable. In case of complex calculations an Excel calculation spreadsheet shall be used. All applied formulae must be visible.	/XLS/	Description: An unprotected Excel calculation sheet was used. Justification of evidences: All applied formulae are visible. No information gaps have been identified. Conclusion: Please refer to CL R5 raised above.	CL R5	OK
<b>5.2 Parameter consistency</b>	/XLS/	Description: All the internal and external parameters and data used for	OK	OK



Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><b>(EB 51 Annex 3, §187 (b))</b></p> <p><i>Assess whether all internal and external parameters and data used for calculation are applied consistently in the monitoring report and the calculation spreadsheet?</i></p> <p><i>Consider only the correct data exchange between the monitoring report and the calculation spreadsheet (if any). Further ensure that consistent designations for parameters in PDD, MR, calculation spreadsheet are applied. The evaluation of the correctness of the parameter values itself should be discussed in the chapter "Monitoring Parameters".</i></p>		<p>calculation are applied consistently in the monitoring report and the calculation spreadsheet</p> <p><i>Justification of evidences:</i> The Excel – calculation sheet has been checked.</p> <p><i>Conclusion:</i> The Excel – calculation sheet is completely in line with the MR. No deviant parameter values have been used in the calculation sheet.</p>		
<p><b>5.3 Applied formulae</b></p> <p><b>(EB 51 Annex 3, §§ 203, 204, 205)</b></p> <p><i>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.</i></p>	<p>/XLS/ /MR/ /AM29/</p>	<p><i>Description:</i> According to AM0029 version 3, Emission Reduction  <math>(ER_y, tCO_2e/y) = BE_y - PE_y - LE_y</math>  Where:  <math>BE_y</math> is the baseline emission during year y.  <math>PE_y</math> is the project emission during year y.  <math>LE_y</math> is the leakage of the project during year y.</p> <p>CO<sub>2</sub> emission coefficient of natural gas per unit:  <math>COEF_{NG,y} = NCV_{NG,y} \times EF_{CO_2,NG,y} \times OXID_{NG}</math></p> <p>Project Emissions:  <math>PE_y = FC_{NG,y} \times COEF_{NG,y}</math></p> <p>Baseline Emissions:</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		$BE_y = EG_{pj,y} \times EF_{BL,CO2,y}$ <p>Leakage:</p> $LE_y = LE_{CH_4,y}$ $LE_{CH_4,y} = [FC_y \times NCV_{NG,y} \times EF_{NG,upstream,CH_4} - EGG_{PJ,y} \times EF_{BL,upstream,CH_4}] \times 21$ <p><i>Justification of evidences:</i></p> <p>The MR, MP of the project, ER spreadsheet and the methodology AM0029 version 3 were checked.</p> <p><i>Conclusion:</i></p> <p>All the applied formulae are in accordance with the monitoring plan and the approved methodology.</p>		
<b>5.4 Completeness of calculation</b> <b>(EB 51 Annex 3, § 204 (a))</b> <i>Assess whether the provided calculations are complete and reflect all requirements of the monitoring plan.</i> <i>Check especially that no standard or old values have been used for calculation where calculations based on up-to-date data is required.</i>	/XLS/ /MR/ /PDD/	<p><i>Description:</i></p> <p>The emission reduction was calculated as net supplied electricity multiply emission factor deducted by project emission and leakage. The net supplied electricity was calculated through the data of Meter No.1 and Meter No.3 monthly readings. The emission factor is calculated ex post, which the latest DNA value has been adopted.</p> <p><i>Justification of evidences:</i></p> <p>The calculation and MR were checked with the registered PDD, applied methodology. The net supplied electricity, the gas consumption and NCV value are cross checked through the monthly invoices and power balance sheets. The calculation</p>	CAR €1	OK



Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p>sheet provided is free of mistakes.</p> <p><i>Conclusion:</i></p> <p>CAR C1</p> <p>The theoretical approach of calculating <math>EF_{BL,upstream,CH_4}</math> is not provided in the Monitoring Report. Revision is necessary.</p>		
<b>6. Quality Management; defined organisational structure, responsibilities and competencies Internal QA/QC and document control</b>				
<p><b>6.1 Management System</b></p> <p><b>(EB 51 Annex 3, §183 a (iii))</b></p> <p><i>Check if the GHG data monitoring system is embedded in a (certified) company quality management system, if so, check if all CDM monitoring procedures been fully integrated in the project participant's quality management system. If not how the GHG management system has been implemented.</i></p>	<p>/QA/ /IM01/ /IM02/ /MM/</p>	<p><i>Description:</i></p> <p>All applicable procedures within the GHG monitoring system have been summarized in a CDM Monitoring Manual and relevant QC/QA procedures.</p> <p><i>Justification of evidences:</i></p> <p>This CDM Monitoring Manual addresses procedures for measurements, collection and compilation of data, data storage and archiving, calibration, maintenance and training of personnel. The MM was assessed by the verification team to ensure the GHG management to be implemented.</p> <p>Furthermore an experienced CDM consulting company has been contracted by the PP in order to heighten the quality monitoring process.</p> <p><i>Conclusion:</i></p> <p>The GHG management system has been implemented.</p>	OK	OK



Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<b>1.6 Roles and Positions</b>  <i>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.</i>  <i>Check further if only duly qualified personnel is involved in the monitoring procedures.</i>	/IM01/ /QA/ /MM/ /RTC/	<i>Description:</i> Responsibilities for measurements, collection and compilation of data, data storage and archiving, calibration, maintenance and training of personnel have been introduced.  <i>Justification of evidences:</i> All appointed persons involved are duly qualified for the task assigned. The certificates of the appointed person have been checked.  <i>Conclusion:</i> The roles and positions of each person have been clearly defined and implemented.	OK	OK
<b>6.3 Trainings</b>  <i>Check if initial trainings have been carried out, in case deemed necessary.</i>	/IM01/ /RTC/	<i>Description:</i> CDM training was carried out on May 12, 2009. The main training topics covered latest CDM information, operation and maintenance of monitoring equipments, monitoring plan, data collection and archive etc. The CDM related staff participated in the CDM training.  <i>Justification of evidences:</i> Training records and attendance list were verified on-site by audit team and submitted to the verifiers.  <i>Conclusion:</i> The training has been carried out appropriately.	OK	OK
<b>6.4 Troubleshooting procedures</b>  <i>Describe relevant troubleshooting measures and assess whether these troubleshooting procedures</i>	/QA/ /IM01/	<i>Description:</i> No special troubleshooting procedures are required.	OK	OK



Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>have been implemented.</i>		<p><i>Justification of evidences:</i></p> <p>Troubleshooting procedures for CDM purposes are in this case considered as essential part of ordinary plant operations.</p> <p><i>Conclusion:</i></p> <p>No special troubleshooting procedures are required.</p>		
<p><b>6.5 Maintenance procedures</b></p> <p>Are appropriate maintenance procedures in place?</p>	/IM01/ /O&M/ /QA/	<p><i>Description:</i></p> <p>The maintenance of the monitoring instruments is in place; a meter list and the calibration plan were established and implemented.</p> <p><i>Justification of evidences:</i></p> <p>The calibration plan was developed based on regulation DL/T 448-2000, GB/T18603-2001, JJG 1037-2008 and GB/T13610-2003. The equipment maintenance procedure and plan were also developed. The annual maintenance plan was confirmed by the grid company. The maintenance records were checked to be appropriate.</p> <p><i>Conclusion:</i></p> <p>The maintenance procedures are appropriate and implemented accordingly.</p>	OK	OK
<p><b>6.6 Internal QA/QC</b></p> <p>Assess whether there are any procedures in place on when, where and how checks and reviews of relevant monitoring parameters as well as further processing of the same are to be carried out. Please determine the evidences to be documented. (This might include</p>	/IM01/ /QA/ /IAR/	<p><i>Description:</i></p> <p>The CDM Monitoring Manual provides corresponding procedures for internal QA/QC measures. Internal Audits were introduced and conducted after each monitoring period. The internal audit was performed.</p>	OK	OK



Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>spot checks by a second person not performing the calculations over manual data transfers, changes in assumptions and the overall reliability of the calculation processes.)</i>		<p><i>Justification of evidences:</i></p> <p>The internal audit report was checked and assessed to be appropriate.</p> <p><i>Conclusion:</i></p> <p>Internal QA/QC has been properly implemented in the practice.</p>		
<p><b>6.7 Data archive</b></p> <p>Check whether all records of monitoring parameters are archived according to the monitoring plan.</p>	/QA/ /IM01/ /MRD/	<p><i>Description:</i></p> <p>All relevant monitoring data was available and procedures are in place so that relevant monitoring data will be retained at least till 2 years after the end of the current crediting period.</p> <p><i>Justification of evidences:</i></p> <p>The record of the monitoring data and the hard &amp; soft copy have been checked and assessed to be appropriate by verification team.</p> <p><i>Conclusion:</i></p> <p>All of the data has been archived according to monitoring plan.</p>	OK	OK
<p><b>6.8 Data protection</b></p> <p>Assess whether appropriate measures have been taken in order to avoid unintended or intended manipulation of the measured data.</p>	/IM01/ /QA/ /MRD/ /DOG/	<p><i>Description:</i></p> <p>The danger of unintended or intended data manipulation can be considered as low, since:</p> <ol style="list-style-type: none"> <li>1. The meters were verified and sealed by the grid company/gas company; the measured data will be cross checked by the monthly invoices.</li> <li>2. On-line monitoring system retrieves data from the meters to the data assembly point and recorded every one hour by the electricity generating dept.</li> </ol>	OK	OK



Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p>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 IT-Systems work within limitation of user authorisation.</p> <p><i>Justification of evidences:</i> The operational daily log, daily and monthly electricity record, monthly invoices and electricity balances are checked, which can be considered to be traceable and appropriately protected.</p> <p><i>Conclusion:</i> The measures taken by the project owner and grid company/gas supplier could ensure the data well to be protected and frozen.</p>		





## ANNEX 2: APPOINTMENT / AUTHORISATION STATEMENTS



### CERTIFICATE OF APPOINTMENT

**Mr. Yongjun Li**

born on 1974-03-03

satisfies the requirements as specified in the TÜV NORD  
JI/CDM CP directives and is hereby appointed as

**TÜV NORD CDM Senior Assessor**

The present appointment will terminate on 2012-11-23  
Certification registration No. 09 11 09 - 39

Essen, 2009-11-24

Head of TÜV NORD JI/CDM Certification Program  
of TÜV NORD CERT GmbH



### CERTIFICATE OF APPOINTMENT

**Mr. Stefan Winter**

born on 1975-12-01

satisfies the requirements as specified in the TÜV NORD  
JI/CDM CP directives and is hereby appointed as

**TÜV NORD CDM Expert**

The present appointment will terminate on 2013-03-14  
Certification registration No. 10 03 14 – 163

Essen, 2010-03-15

Head of TÜV NORD JI/CDM Certification Program  
of TÜV NORD CERT GmbH



### CERTIFICATE OF APPOINTMENT

**Mr. Martin Saalmann**

born on 1976-02-23

satisfies the requirements as specified in the TÜV NORD  
JI/CDM CP directives and is hereby appointed as

**TÜV NORD JI/CDM Senior Assessor**

The present appointment will terminate on 2013-03-31  
Certification registration No. 10 04 01 – 22

Essen, 2010-04-01

Head of TÜV NORD JI/CDM Certification Program  
of TÜV NORD CERT GmbH



### **CERTIFICATE OF APPOINTMENT**

**Mr. Tao Yan**

born on 1972-04-01

satisfies the requirements as specified in the TÜV NORD  
JI/CDM CP directives and is hereby appointed as

**TÜV NORD CDM Expert**

The present appointment will terminate on 2013-03-07

Certification registration No. 10 03 02 - 131

Essen, 2010-03-08

  
Head of TÜV NORD JI/CDM Certification Program  
of TÜV NORD CERT GmbH



### **CERTIFICATE OF APPOINTMENT**

**Mr. Dipl.-Ing. Rainer Winter**

born on 1963-02-21


satisfies the requirements as specified in the TÜV NORD  
JI/CDM CP directives and is hereby appointed as

**TÜV NORD JI/CDM Senior Assessor**

The present appointment will terminate on 2010-07-05

Certification registration No. 04 02 154-03

Essen, 2007-07-06

  
Deputy of TÜV NORD JI/CDM Certification Program  
of TÜV NORD CERT GmbH