

# Henan Zhengzhou Grid Connected Natural Gas Combined Cycle Power Plant

## CDM MONITORING REPORT NO.2 Version 01

CDM Registration Ref. No. 1304



**Monitoring Period:** 01 May – 31 December 2008

**Date of Report:** 19 November 2009

*Project Participants:*



**Zhengzhou Combined Cycle Power Co., Ltd**



**Total Gas & Power Limited**

*CDM Consultant:*



**CPI Carbon Asset Management Co., Ltd**



## Contents

1	General Project Activity and Monitoring Information.....	1
1.1	Title of the Project Activity .....	1
1.2	CDM Registration Date and Number .....	1
1.3	Short description of the project activity.....	1
1.4	Monitoring Period.....	1
1.5	Implementation Status of the Project activity.....	1
1.6	Methodology Applied to the Project Activity.....	1
1.6.1	Baseline Methodology .....	1
1.6.2	Monitoring Methodology .....	1
1.7	Intended deviations, revisions and clarifications to the registered PDD:.....	1
1.8	Intended deviations or revisions to the registered monitoring plan (Decision 17/CP.7, Annex H, paragraph 57 to be considered): .....	1
1.9	Person(s) responsible for the preparation and submission of the monitoring report: .....	2
1.9.1	CDM Project Consultant.....	2
1.9.2	Project Participants.....	2
2	Monitoring Data and Calculations of Emission Reductions .....	3
2.1	Data Requirements for Monitoring as Prescribed in PDD .....	3
2.2	Management of Database.....	3
2.3	Data and Record Archiving System .....	3
2.4	Calculations of Emission Reductions .....	3
2.4.1	Project Emission.....	3
2.4.2	Baseline Emissions .....	4
2.4.3	Monitoring Leakage.....	5
2.4.4	Emissions Reduction Calculations for the Project .....	6
3	Quality Assurance and Quality Control Measures .....	8
3.1	QA and QC Procedures of Measuring Data .....	8
3.2	Calibration of Metering Equipments .....	8
3.3	Monitoring Institution.....	9
3.3.1	Roles and Responsibilities .....	9
4	Records Archiving .....	11
	Annexes .....	13
	Annex 1. Data Monitored for the Selected Monitoring Period <i>p2</i> .....	13
	Annex 2. Technical Drawing .....	15



## **1 General Project Activity and Monitoring Information**

### **1.1 Title of the Project Activity**

Henan Zhengzhou Grid Connected Natural Gas Combined Cycle Power Plant

### **1.2 CDM Registration Date and Number**

This CDM Monitoring Report refers to the CDM Project titled “Henan Zhengzhou Grid Connected Natural Gas Combined Cycle Power Plant” registered by the CDM Executive Board on 22<sup>nd</sup> February 2008 (Ref. No. 1304).

### **1.3 Short description of the project activity**

Henan Zhengzhou Grid Connected Natural Gas Combined Cycle Power Plant (hereinafter referred to as “the project”) is located in Xiangying village, Zhengzhou city, Henan province, and has geographical coordinates of 113°31'47" east longitude and 34°47' 45" north latitude.

The project is to be built as a grid connected electricity generation plant using natural gas (NG), serving as a peak load balancing power plant, the project has an installation capacity of 780 MW by 2×390 MW gas/steam turbines using combined cycle technology, running 3500h with a net electricity generation about 2598GWh to be sold into the Henan Grid, a sub-grid of an independent regional grid - Central China Grid (CCG), while an annual NG consumption of 525 million m<sup>3</sup> is to be supplied on a firm basis according to a Fuel Supply Agreement signed.

The gas turbine and steam turbine generator output are stepped up into 500 KV in a newly built switchyard where is connected into the CCG, an independent regional grid in the PRC.

### **1.4 Monitoring Period**

The monitoring period is from 00:00hrs, 01<sup>st</sup> May 2008 to 24:00hrs, 31<sup>st</sup> December 2008. This is the second monitoring report for this project.

### **1.5 Implementation Status of the Project activity**

During the second selected monitoring period, all the Project equipments, processes and operation remain the same as the first selected monitoring period and CDM-PDD. The Project monitoring activity was implemented according to the CDM-PDD monitoring plan, which also remains unchanged.

### **1.6 Methodology Applied to the Project Activity**

#### **1.6.1 Baseline Methodology**

The Project utilizes the Approved Baseline Methodology AM0029 Version 01: “Methodology for Grid Connected Electricity Generation Plants using Natural Gas.”

#### **1.6.2 Monitoring Methodology**

The Project utilizes the Approved Baseline Methodology AM0029 Version 01: “Grid Connected Electricity Generation Plants using Non-Renewable and Less GHG Intensive Fuel.”

### **1.7 Intended deviations, revisions and clarifications to the registered PDD:**

No deviations or revisions to the registered PDD are observed.

### **1.8 Intended deviations or revisions to the registered monitoring plan (Decision 17/CP.7, Annex H, paragraph 57 to be considered):**

No deviations or revisions to the Monitoring Plan are observed.



**1.9 Person(s) responsible for the preparation and submission of the monitoring report:**

**1.9.1 CDM Project Consultant**

**Mr. Han Shudong, Technology Department Deputy Manager**

CPI Carbon Asset Management Co., Ltd

11th Floor, Rongbao Mansion, No.26 Gulouwai Street, Beijing, China 100011

Tel.: +86 (0) 10-85285120-812

Fax: +86 (0) 10-85286991

Email: [hanshudong@cpcec.com](mailto:hanshudong@cpcec.com)

**1.9.2 Project Participants**

**Mr. Li Bo, CDM Manager**

Zhengzhou Combined Cycle Power Co., Ltd

No. 100, Wutong Street, Hi-New Technology Industry Development Park,

Zhengzhou, Henan 450001

Tel.: 0371-67848610

Fax: 0371-67848500

Email: [libo@cpi-zqp.cn](mailto:libo@cpi-zqp.cn)

**Ms. Basak Beyazay Odemis, Emissions Trading Manager**

Total Gas & Power Limited

10 Upper Bank Street

Canary Wharf

London E14 5BF

Tel.: +44 (0) 20 7718 6643

Fax: +44 (0) 20 7718 6553

Email: [basak.beyazay@total.com](mailto:basak.beyazay@total.com)



## 2 Monitoring Data and Calculations of Emission Reductions

### 2.1 Data Requirements for Monitoring as Prescribed in PDD

The monitoring data requirements are consistent with those listed in the Clean Development Mechanism Project Design Document (CDM-PDD). The parameters monitored by this project are listed in the following tables:

Data/Parameter	Description	Data Unit	Comment
$EG_{out,p2}$	Electricity generated and sold by the Project and sold into CCG during the second selected monitoring period $p2$ .	MWh	
$EG_{in,p2-1}$	Electricity purchased by the Project from the CCG (MWh) at <b>Songshan Transformer Station</b> and connected to the Project during the second selected monitoring period $p2$ .	MWh	
$EG_{in,p2-2}$	Electricity purchased by the Project from the CCG (MWh) at <b>Suohe Transformer Station</b> and connected to the Project during the second selected monitoring period $p2$ .	MWh	
$FC_{f,p2}$	Natural gas consumed by the Project during the second selected monitoring period $p2$ .	$m^3$	
$NCV_{f,p2}$	Net calorific value per volume unit of natural gas during the second selected monitoring period $p2$ .	GJ/ $m^3$	

A complete list of the data monitoring requirements is listed in Annex 1.

### 2.2 Management of Database

Since the first monitoring period, the Monitoring Working Group (MWG) has been continuously managing the monitoring database. The MWG consists of five operational managers and engineers who are trained and qualified to deal with the CDM data monitoring process.

### 2.3 Data and Record Archiving System

As in the first monitoring period, the data archiving system continues to document all the monitoring data collected and recorded in the specific forms, together with other related documents and collectables as required, such as commercial receipts. The data is recorded in either electronic and/or hard copy formats and is archived for two years following the end of the crediting period. The MWG manages the data and archives it on a monthly basis according to the quality assurance and control (QA/QC) procedures.

### 2.4 Calculations of Emission Reductions

#### 2.4.1 Project Emission

As in the first monitoring period, the Project continues to use natural gas (NG) to generate electricity without using any auxiliary fuels for power production during this second monitoring period ( $p2$ ).

The  $CO_2$  emitted as a result of the project activities ( $PE_{p2}$ ) is calculated as follows:

$$PE_{p2} = \sum FC_{f,p2} \times COEF_{f,p2}$$

Where;

$FC_{f,p2}$  is the amount of NG ( $m^3$ ) combusted by the Project during the second selected monitoring period ( $p2$ );



$COEF_{f,p2}$  is the CO<sub>2</sub> emission coefficient (tCO<sub>2</sub>e/m<sup>3</sup>) of the NG during the second selected monitoring period ( $p2$ ) and is calculated as follows;

$$COEF_{f,p2} = \sum NCV_{f,p2} \times EF_{CO2,f,p2} \times OXID_f$$

Where;

$NCV_{f,p2}$  is the net calorific value (energy content) per volume unit of NG (GJ/m<sup>3</sup>) during the second selected monitoring period ( $p2$ ) as provided by the fuel supplier;

$EF_{CO2,f,p2}$  is the CO<sub>2</sub> emission factor per unit of energy of NG during the second selected monitoring period ( $p2$ ) (kgCO<sub>2</sub>/TJ). The  $EF_{CO2,f,p2}$  was 54,300 kgCO<sub>2</sub>/TJ (IPCC 2006, p.24);

$OXID_f$  is the oxidation factor of NG with the value of 1 (100%) as defined by the Intergovernmental Panel on Climate Change (IPCC);

For the second monitoring period ( $p2$ ), the monitoring records managed by the project owner indicates that the total amount of NG consumption ( $FC_{f,p2}$ ) is 279,357,593 (m<sup>3</sup>), while the same data records provided by the NG Supplier's indicates the amount of 283,366,402 (m<sup>3</sup>). In line with conservative emissions reporting practices, the project participants opted to use the 283,366,402 (m<sup>3</sup>) figure provided by the NG Supplier for the second selected monitoring period ( $p2$ ).

Therefore;

$$FC_{f,p2} = 283,366,402 \text{ (m}^3\text{)};$$

Consistent with the first monitoring period, the data of the  $NCV_{f,p2}$  is provided by the NG Supplier and the weighted average  $NCV_{f,p2}$  is 0.03379182 (GJ/m<sup>3</sup>). Therefore;

$$NCV_{f,p2} = 0.03379182 \text{ (GJ/m}^3\text{)};$$

Therefore, the  $NCV_{f,p2}$ ,  $COEF_{f,p2}$ , and  $PE_{p2}$  yielded the following;

$$NCV_{f,p2} = 0.03379182 \text{ (GJ/m}^3\text{)}$$

$$COEF_{f,p2} = 0.00183490 \text{ (tCO}_2\text{e/m}^3\text{)}$$

$$PE_{p2} = 519,948 \text{ (tCO}_2\text{e)}$$

*Detailed calculations can be found in the annexed spreadsheets*

#### 2.4.2 Baseline Emissions

Pursuant to the CDM-PDD, baseline emissions are calculated by multiplying the net amount of electricity generated by the Project ( $EG_{PJ,p2}$ ) with an updated baseline emission factor ( $EF_{p2}$ ) as seen in the following equation:

$$BE_{p2} = EG_{PJ,p2} \times EF_{p2}$$

Where;

$EG_{PJ,p2}$  is the net amount of electricity generated by the project and sold to the China Central Grid (CCG) during the second selected monitoring period ( $p2$ );

Where;

$$EG_{PJ,p2} = EG_{out,p2} - EG_{in,p2}$$

$EG_{out,p2}$  is the amount of electricity generated by the Project and sold to the CCG during the



second selected monitoring period ( $p2$ );

$EG_{in,p2}$  is the amount of the electricity purchased by the Project during the second selected monitoring period ( $p2$ ) from the CCG from the following two sources:

- ( $EG_{in,p2-1}$ ) is the amount electricity purchased by the Project from the CCG (MWh) at the *Songshan Transformer Station*;
- ( $EG_{in,p2-2}$ ) is the amount electricity purchased by the Project from the CCG (MWh), at the *Suohe Transformer Station*;

Therefore;

$$EG_{in,p2} = (EG_{in,p2-1} + EG_{in,p2-2})$$

Both the CCG and project owner's records indicated that the total amount of  $EG_{out,p2}$  during the second selected monitoring period ( $p2$ ) was 1,399,514.25 (MWh).

Accordingly,  $EG_{in,p2-1}$  and  $EG_{in,p2-2}$  equals:

$$EG_{in,p2-1} = 3,182.25 \text{ (MWh)}; \quad EG_{in,p2-2} = 690.36 \text{ (MWh)}.$$

As such,  $EG_{PJ,p2}$  is calculated as follows:

$$EG_{PJ,p2} = EG_{out,p2} - (EG_{in,p2-1} + EG_{in,p2-2}) = 1,395,641.64 \text{ (MWh)}.$$

According to the CDM-PDD,  $EF_{BM,p2}$  is the baseline emission factor of the CCG ( $EF_{p2}$ ) and is used in the calculation of the emission reductions achieved by the Project;  $EF_{BM,p2}$  must be updated on an annual basis given that *ex-post* is chosen by the CDM-PDD.

At July 2<sup>nd</sup> 2009, the Chinese DNA have stated that 2007 CCG Baseline Emission Factor<sup>1</sup> ( $EF_{BM,p2}$ ) is now 0.5802 tCO<sub>2</sub>e/MWh instead of 0.6758 tCO<sub>2</sub>e/MWh as was accounted for during the first selected monitoring period.

Therefore;

$$BE_{p2} = 809,751.28 \text{ (tCO}_2\text{e)}$$

*Detailed calculations can be found in the annexed spreadsheets.*

### 2.4.3 Monitoring Leakage

The leakage emission amount is calculated by using the following equation:

$$LE_{p2} = LE_{CH4,p2} + LE_{LNG,CO2,p2}$$

Where;

$LE_{p2}$  is a leakage emission during the second monitoring period ( $p2$ ) in tCO<sub>2</sub>e;

$LE_{CH4,p2}$  is a leakage emission due to fugitive upstream CH<sub>4</sub> emissions during the second selected monitoring period ( $p2$ ) in tCO<sub>2</sub>e;

$LE_{LNG,CO2,p2}$  is leakage emissions due to fossil fuel combustion/electricity consumption associated with the liquefaction, transportation, re-gasification and compression of liquefied natural gas (LNG) into a natural gas transmission or distribution system during the second selected monitoring period ( $p2$ ) in tCO<sub>2</sub>e.

Consistent with the first monitoring period, no LNG is used by the Project; thus only fugitive upstream CH<sub>4</sub> emissions are taken into account. Therefore  $LE_{p2} = LE_{CH4,p2}$ . Furthermore, the

<sup>1</sup> <http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File2333.pdf>



fugitive CH<sub>4</sub> emissions of the Project in the second selected monitoring period (*p2*) is calculated as follows:

$$LE_{CH_4,p2} = (FC_{f,p2} \times NCV_{f,p2} \times EF_{NG,upstream,CH_4} - EG_{PJ,p2} \times EF_{BL,upstream,CH_4}) \times GWP_{CH_4}$$

Where;

$FC_{f,p2}$  is the amount of NG (m<sup>3</sup>) consumed by the Project during the second selected monitoring period (*p2*), which equals 283,366,402m<sup>3</sup>;

$NCV_{f,p2}$  is the weighted average net calorific value of the NG (GJ/m<sup>3</sup>) consumed by the Project during the second selected monitoring period (*p2*), which equals 0.03379182 GJ/m<sup>3</sup>;

$EF_{NG,upstream,CH_4}$  is determined by the IPCC as 296×10<sup>-6</sup>t CH<sub>4</sub> per GJ;

$EG_{PJ,p2}$  is the electricity generated by the Project and sold to the CCG during the second monitoring period (*p2*), which equals 1,395,641.64MWh;

$GWP_{CH_4}$  is the global warming potential of methane valid for the relevant commitment period, and is determined as 21; and

$EF_{BL,upstream,CH_4}$  is the emission factor for upstream fugitive methane emissions occurring in the absence of the Project activity (tCH<sub>4</sub>/MWh) electricity generated by the Project. It is defined as follows:

The emission factor for upstream fugitive CH<sub>4</sub> emissions ( $EF_{BL,upstream,CH_4}$ ) occurring in the absence of the Project activity is calculated consistent with the baseline emission factor ( $EF_{BL,CO_2,p2}$ ); the  $EF_{BL,upstream,CH_4}$  for the second selected monitoring period (*p2*) therefore equals:  $EF_{BL,upstream,CH_4} = 0.00425691$  (tCH<sub>4</sub>/MWh).

*Detailed calculations can be found in the Annexed spreadsheets.*

Therefore;

$$LE_{CH_4,p2} = -65,242.57 \text{ (tCO}_2\text{e)}.$$

As the calculated result above gives a negative value, the leakage is zero ( $LE_{p2} = 0$ ).

#### 2.4.4 Emissions Reduction Calculations for the Project

According to the CDM-PDD, to calculate the emission reductions the following equation applies:

$$ER_{p2} = BE_{p2} - PE_{p2} - LE_{p2}$$

Where;

$ER_{p2}$  is the total amount of emission reductions during the selected monitoring period (*p2*) (tCO<sub>2</sub>e);

$BE_{p2}$  is the emissions of the baseline scenario during the second selected monitoring period (*p2*) (tCO<sub>2</sub>e);

$PE_{p2}$  is the emissions of the Project scenario during the second selected monitoring period (*p2*) (tCO<sub>2</sub>e);

$LE_{p2}$  is the leakage of this second monitoring period *p2* (tCO<sub>2</sub>e) which equals “0” according to the calculation provided above;

In conclusion, the total amount of emission reductions due to the Project activities during the second selected monitoring period (*p2*) is calculated for:



$ER_{p2} = 289,803$  (tCO<sub>2</sub>e)



### 3 Quality Assurance and Quality Control Measures

#### 3.1 QA and QC Procedures of Measuring Data

QA and QC Procedures are same as that of the Project first monitoring period:

Based on the defined quality assurance and control measures (QA/QC) defined in the CDM-PDD, in order to ensure the monitoring process is consistent with the CDM-PDD and meets the CDM requirements and related international rules, the project owner engaged a project Monitoring Working Group (MWG) in Oct 2007. As a result, a CDM Manual (2008) was developed with a purpose of providing the owner with detailed guidelines and requirements on its daily monitoring management and archiving system operations. At the same time, a set of related recording forms were also developed and tested for the monitoring activities including data monitoring and archiving as well as the staff monitoring training and reporting activities.

The data quality assurance and control procedures are assembled in the monitoring management and data archiving systems. The procedures enforce and emphasize the importance of the reliability, stability, and accuracy of the data.

#### 3.2 Calibration of Metering Equipments

Same as the first monitoring period, during the second monitoring period, the calibration are carried out in accordance with the CDM-PDD.

The calibration of electricity meters is the responsibility by the grid company which is defined by the Power Purchase Agreement signed by the owner of project and the grid company. During this monitoring period, the calibrations have been carried out in accordance with the registered CDM-PDD, all the related copies of calibration reports issued by those qualified calibration institutions for each calibrated electricity meter are collected for further verifications upon request.

Further, the calibration of the natural gas flow meter and composition analysis meter is the responsibility of the NG supplier which is defined by the NG Supply Agreement signed between the project owner and the NG supplier. During this monitoring period, the calibrations have been carried out in accordance with the registered CDM-PDD, all the related original copies of Calibration Reports issued by the selected calibrators were collected by the Monitoring Group for further verifications upon request.

The related information on calibration of the monitoring instruments is provided in details as follows:

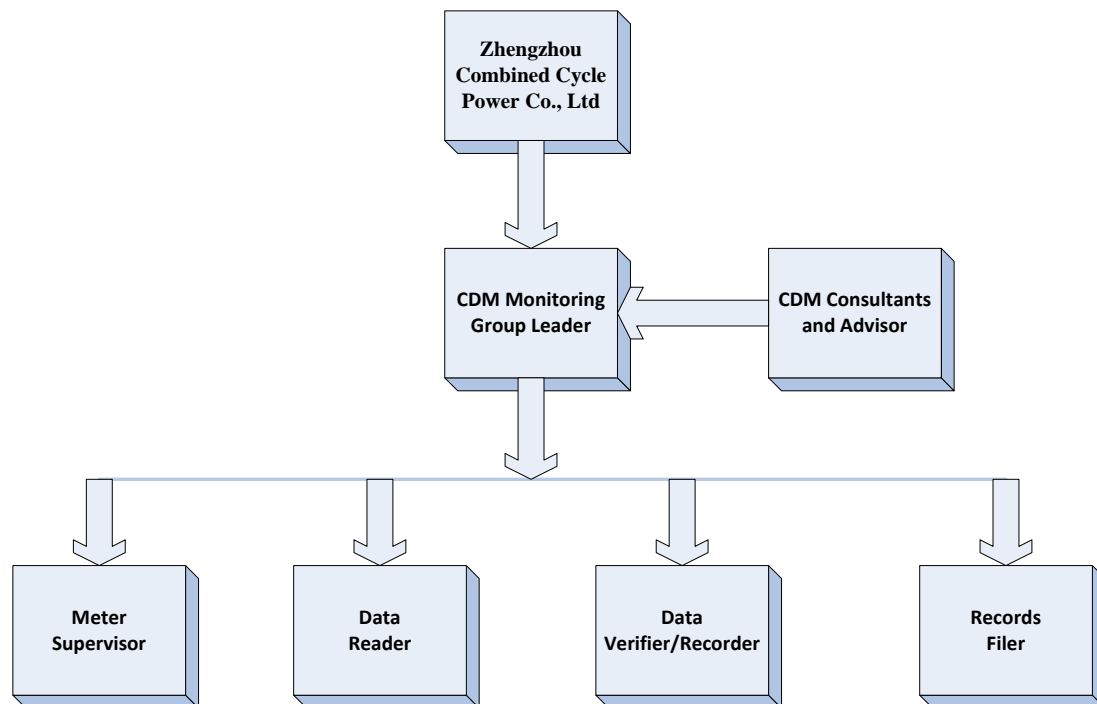
Instruments	S/N	Calibration entity
Main electric meter of Songshan	41504307	Henan Electric Power Research Institute, Henan Metrological Testing Center of Electric Power Ministry
Backup electric meter of Songshan	41504296	Henan Electric Power Research Institute, Henan Metrological Testing Center of Electric Power Ministry
Electric meter of Suohe	0106000161	Henan Electric Power Research Institute, Henan Metrological Testing Center of Electric Power Ministry
Ultrasonic natural gas flowmeter-1 of gas station	06-400027	National Crude Oil Metering Station
Ultrasonic natural gas flowmeter-2 of gas station	06-400028	National Crude Oil Metering Station
Turbine flower-1 of PP	10501760	Flow measurement Center of Aviation Industries of China
Turbine flower-2 of PP	10501761	Flow measurement Center of Aviation Industries

		of China
Flow rate computer-1 of PP	05294002	National Crude Oil Metering Station
Flow rate computer-2 of PP	05291008	National Crude Oil Metering Station
On-line process gas chromatograph of gas station	100841	National Institute of Metrology P. R. China

### 3.3 Monitoring Institution

The monitoring activities are under the responsibility of the Monitoring Working Group (MWG) consisting of five staff assigned by the project company. All the members of the MWG were trained with the qualifications that are required for handling the monitoring activities. According to the CDM Manual (2008), monitoring staff must pass the test demonstrating their understanding and responsibility of the assigned monitoring position, CDM and monitoring know-how, system integrity, and etc. All staff that passed the exam were certified by the CDM training organization, and only those certified staffs are qualified to be assigned to the Monitoring Working Group.

During November 2007- February 2008, all the staff assigned to the MWG were trained on the CDM Manual and passed the exams, thus were certified with the qualifications for handling the monitoring activities



**Figure 1. Organization Structure for the Monitoring Activities**

The MWG is under the supervision of the CDM Steering Committee consisting of the senior managements of project and parent companies. Its day-to-day monitoring activities are under the guidance provided by the external CDM consultants. Staffs currently working for the MWG are all qualified for the assigned monitoring activities, as a result of two training workshops held in November 2007 and February 2008 which were provided by the CDM consultant team. 5 CDM Monitoring Certificates were issued to each member of the team by name with one-year validity. The operational and management structure is shown in the Figure 1.

#### 3.3.1 Roles and Responsibilities

According to the CDM Manual, the Monitoring Working Group was designed as a functional



working team to deal with all the issues related to the CDM monitoring activities. The detailed descriptions on the responsibilities and working scopes of each role of this working team are provided in the CDM Manual.



#### 4 Records Archiving

The records archiving activities of the project will be under the responsibility of the File Keeper of the Monitoring Group, and all the monitoring records are archived for 2 years after the ending of the crediting period of the project.

A set of recording forms were designed and used for recording each set of data to be monitored as well as the related monitoring activities as specified and required by the CDM Manual.

As an example, some of the specific Forms defined by the CDM Manual are illustrated at the Table below.

<b>Recording Forms</b>	<b>Monitoring Data and Activities</b>
<b>Electricity Generated and Sold (<math>EG_{PJ,p2t}</math>) Monthly Monitoring Recording Form</b>	Daily reading from the meter defined by the CDM-PDD is recorded as the original data of <i>Electricity Generated and Sold into the Grid</i> , and all the recorded daily readings are required to be further put into a Monthly Monitoring Form accordingly.
<b>NG Consumption (<math>FC_{f,p2}</math>) Weekly Monitoring Recording Form</b>	Daily reading from the flow meter defined by the CDM-PDD is recorded as the original data of the amount of NG supplied to the Project and all the recorded daily readings are required to be further put into the related Monthly Monitoring Form accordingly.
<b>NCV Bi-Weekly Monitoring Recording Form</b>	The daily NCV value provided by NG supplier is collected and further recorded into the related Bi-Weekly Monitoring Form accordingly.
<b>Electricity Purchased (<math>EG_{in,p2-1}</math>) Monitoring Recording Form (Songshan Station)</b>	Daily reading from the meter defined by the CDM-PDD is recorded as the original data of <i>Electricity Bought at the Songshan Station</i> , and all the recorded daily readings are required to be further put into the related Monthly Monitoring Form accordingly.
<b>Electricity Purchased (<math>EG_{in,p2-2}</math>) Monitoring Recording Form (Suohe Station)</b>	Daily reading from the meter defined by the CDM-PDD is recorded as the original data of <i>Electricity Bought at the Suohe Station</i> , and all the recorded daily readings are required to be further put into the related Monthly Monitoring Form accordingly.
<b>Training Activities Monitoring Recording Form</b>	The activities related to each monitoring training workshops is recorded as the case might be.
<b>Monitoring Staffing Monitoring Recording Form</b>	Staff assigned to the monitoring position with the No. Certification, and related responsibilities, and monitoring training and working history is recorded as the case might be.

In addition, Forms for other related activities were also used for monitoring recording activities, such as the management steering committee, the QA/QC review and check up recording forms and etc.

All the Forms are available in both electronic and printed formats under the daily working responsibility of the file keeper.

Before archiving and cross checking, all the recording forms require a signature by the responsible team members (the team leader, the staff member responsible for recording, or the meter supervisor). The Form which is signed by the team members are archived into the data archiving system by the trained and qualified File Keeper either in electronic or the printed formats depending on the nature of the records. Two copies of the original records are made, of which one copy is provided to the external CDM consultants (on a monthly basis), and the other is kept by the team leader for checking and back-up purposes.

Furthermore, according to the QA/QC Measures defined by the CDM Manual of the



proposed project, all the records archived in the monitoring archiving system, together with the calibration reports, sales and purchasing receipts, and other related archived data are available for CDM verification.

## Annexes

### Annex 1. Data Monitored for the Selected Monitoring Period *p2*

Data	Description	Source of Data	Data Unit	Measured (m) Calculate (c)	Recording Frequency	Proportion of Data Monitored	Data to be Archived (Electronic/Paper)	Note
<i>EG<sub>out,p2</sub></i>	Amount of electricity generated and sold by the Project and sold into CCG during the second selected monitoring period <i>p2</i> .	Data readings collected and recorded by the owner in Form	MWh	m	Monthly	100%	Electronic/ Paper	Daily reading is collected for monthly recording in the Forms to be filed by the trained and qualified staff. All the original readings, recording forms, and the related commercial receipts are archived in consistency with the QA and QC measures setup for the monitoring activities of the Project. Commercial receipts issued by the grid company are to be used for cross-check.
<i>EG<sub>in,p2-1</sub></i>	The amount of electricity purchased by the Project from the CCG (MWh) at <b>Songshan Transformer Station</b> and connected to the Project during the second selected monitoring period <i>p2</i> .	Data readings collected at <i>Songshan Station</i> and recorded by the owner in Form	MWh	m	Monthly	100%	Electronic/ Paper	Daily reading is collected for monthly recording in the Form to be filed by the trained and qualified staff. All the original data readings, recording forms, and the related commercial receipts are archived in consistency with the QA and QC measures setup for the monitoring activities of the Project. Commercial receipts issued by the grid company are to be used for cross-check.
<i>EG<sub>in,p2-2</sub></i>	The amount electricity purchased by the Project from the CCG (MWh) at <b>Suohe Transformer Station</b> and connected to the Project during the	Data readings collected at <i>Suohe Station</i> and recorded by the owner in Form	MWh	m	Monthly	100%	Electronic/ Paper	Daily reading is collected for monthly recording in the Form to be filed by the trained and qualified staff. All the original data readings, recording forms, and the related commercial receipts are archived in consistency with the QA and QC measures setup for the monitoring activities of the Project. Commercial receipts issued by the grid company are to be used for cross-check.



second selected monitoring period *p2*.

<i>FC<sub>f,p2</sub></i>	The amount of NG consumed by the Project during the second selected monitoring period <i>p2</i> .	Commercial receipts provided by the fuel supplier	m <sup>3</sup>	m	Daily	100%	Electronic/ Paper	In Addition to the commercial receipts, daily readings are collected for weekly recording in the Form to be filed by the trained and qualified staff of the owner. All the original data readings, recording forms, and the related commercial receipts are archived in consistency with the QA and QC measures setup for the monitoring activities of the Project. Commercial receipts issued by the grid company are to be used for cross-check.
<i>NCV<sub>f,p2</sub></i>	Net calorific value per volume unit of natural gas during the second selected monitoring period <i>p2</i> .	Data supplied by the NG supplier and recorded by the owner in Forms	GJ/m <sup>3</sup>	c	Bi-Weekly	100%	Electronic/paper	Daily reading is provided by the NG Supplier for the bi-weekly recording in the Form to be filed by the trained and qualified staff of the owner. All the original data sheets, recording forms are archived in consistency with the QA and QC measures setup for the monitoring activities of the Project.

### Annex 2. Technical Drawing

According to the CDM-PDD, the project installed 2×390MW gas/steam turbines that use NG combined cycle technology to generate electricity sold into the Henan Grid, a sub-grid of an independent regional grid-Central China Grid (CCG).

The technical drawing for the process flow, together with the monitoring meter points, of the project is illustrated in Figure A1 below:

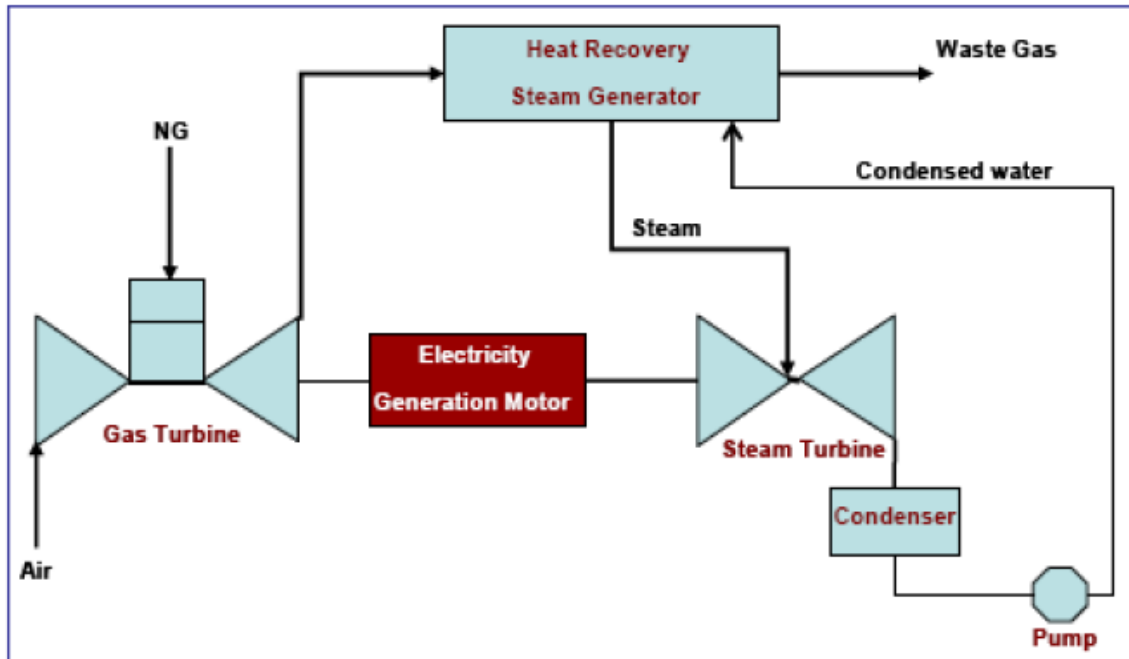


Figure A1. The Process Flow and Monitoring Meter Points of the Project