

Pre-CDM Monitoring Report

of

Zhangjiagang Nature Gas Power Generation Project

UNFCCC CDM reference number 2439

Monitoring period: from 08/06/2005 to 10/09/ 2009

Version: 02

Date: 02/06/2010

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1. Summary

Zhangjiagang Nature Gas Power Generation Project (UNFCCC CDM reference number 2439, hereinafter referred as “the project”) was registered under Approved Baseline and Monitoring Methodology AM0029/ Version 03 on 11/09/2009¹.

The project started trial production on 08/06/2005² and started commercial production on 12/01/2007³, which means the project has been produced a certain emission reductions prior to registration at CDM EB. The purpose of this Monitoring Report (MR) is to calculate the quantity of this mission reductions produced by the project within the pre-CDM monitoring period which covered from 08/06/2005 to 10/09/2009. The detailed activity status of the project is listed as below:

Crediting year	Monitoring period	Activity status	Dates
Pre-CDM	Pre-CDM	Start of trial production	08/06/2005
Pre-CDM		Start of commercial production	12/01/2007
1 of CDM	1	The 1 st monitoring period	11/09/2009 to 31/10/2009

In this pre-CDM monitoring period,

- The net electricity to the grid is metered as 8,852,514.85MWh, and the build margin emission factor of ECPG is 0.6826 tCO₂e/MWh, so the baseline emissions is calculated as 6,042,467 tCO₂e;
- The total consumption of natural gas is metered as 1,762,729,420Nm³, the net calorific value of natural gas is calculated as 33.7179MJ/Nm³ based on the daily data provided by the gas supplier, the CO emission factor of natural gas is 54300 tCO₂/PJ and the oxidation factor of natural gas is 1 based on IPCC 2006, so the project emissions is calculated as 3,227,347 tCO₂e;
- The leakage is calculated as -546,440 tCO₂e, so according to the methodology, the leakage should be regarded as 0;
- The total emission reductions claimed by the project is calculated as 2,707,872 t CO₂e, and the yearly emission reductions for 2005, 2006, 2007, 2008 and 2009 are calculated as 87,870 tCO₂e, 642,967 tCO₂e, 759,357 tCO₂e, 667,161 tCO₂e and 550,517 tCO₂e respectively.

2. Reference

Sectoral scope 1: “Energy Industries”;

¹ <http://cdm.unfccc.int/Projects/DB/DNV-CUK1237357899.03/view>

² http://www.chinapipe.net/gas/display.asp?gas_id=226

³ The certificate for Acceptance test of trial production of the project issued by the local governments on 12/01/2007.

Approved Baseline and Monitoring Methodology AM0029/ Version 3: “Baseline Methodology for Grid Connected Electricity Generation project using Natural Gas” and “Monitoring methodology for grid connected generation plants using non-renewable and less GHG intensive fuel” (The actual version when the project was registered at UNFCCC on 11/09/2009);

The registered Project Design Document/ Version 05: “Zhangjiagang Natural Gas Power Generation Project” completed on 12/02/2009;

3. Definition

- y:** Monitoring Period (in this Monitoring Report, from 08/06/2005 to 10/09/2009)
- PDD:** The registered Project Design Document/ Version 05 “Zhangjiagang Natural Gas Power Generation Project” completed on 12/02/2009
- MP:** Monitoring plan
- MR:** Monitoring report
- GHG:** Greenhouse Gas
- IPCC:** Intergovernmental Panel on Climate Change
- ECPG:** East China Power Grid defined by the DNA of China
- VCS:** Voluntary Carbon Standard

4. General description of the project

4.1 Briefing

The project is a new natural gas fired grid-connected power plant which is located in Donglai Town of Zhangjiagang City in East China’s Jiangsu Province, and which was invested, constructed and operated by Zhangjiagang Huaxing Power Co., Ltd. (hereinafter refer to as “Huaxing”). The geographical coordinates of the project site is at longitude 120°39'E and latitude 31°53'N.

The project installs two power units of 9F-level gas-steam combined cycle with the total rated installed capacity of 2*390MW, and supplies the generated electricity to Jiangsu Power Grid (hereinafter refer as “JPG”, JPG is the integral part of East China Power Grid, hereinafter refer as “ECPG”).

In comparison with the baseline scenario described in the PDD, the project can lead to substantial greenhouse gas emissions reductions due to using the low-carbon intensive fuel and adopting the much higher efficient power generation technology.

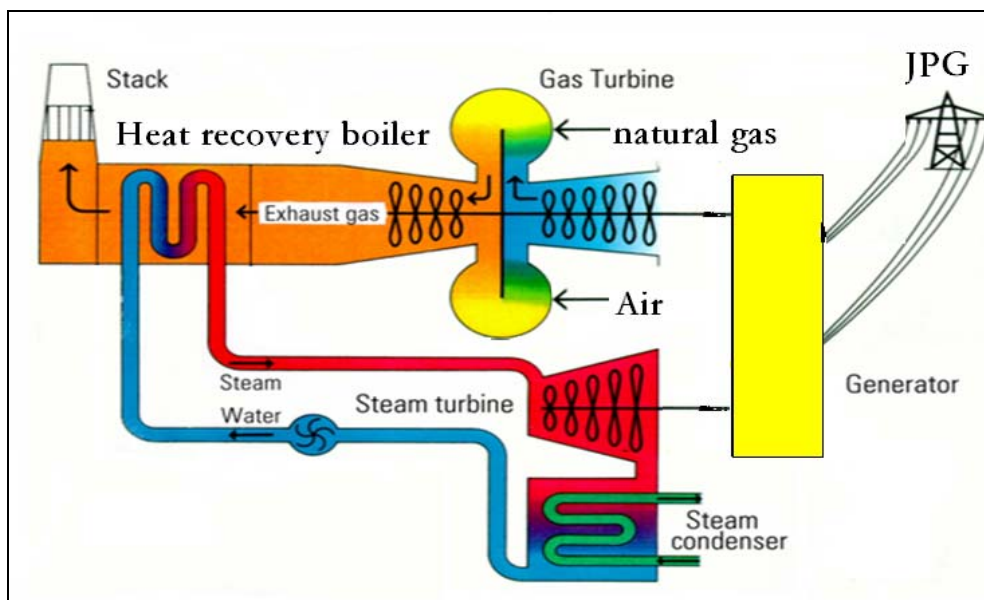
The project can also contribute to the local sustainable development in the following ways:

- Reduce other pollutants (such as SO₂, NO_x, dust, etc) compared to a business as usual approach, thereby improve the local environment quality;
- Enhance the peak regulation capacity to the local grid and improve the electric supply quality of the local grid;
- Create the employment opportunities for the local residents.

4.2 Technical description

The power generation unit adopted by the proposed project is 9F-level gas-steam combined cycle, and each unit consists of a gas turbine, a heat recovery boiler, a steam turbine and a generator.

The working principle of the power units can be illustrated as below:



The detailed information of the power units are tabulated below:

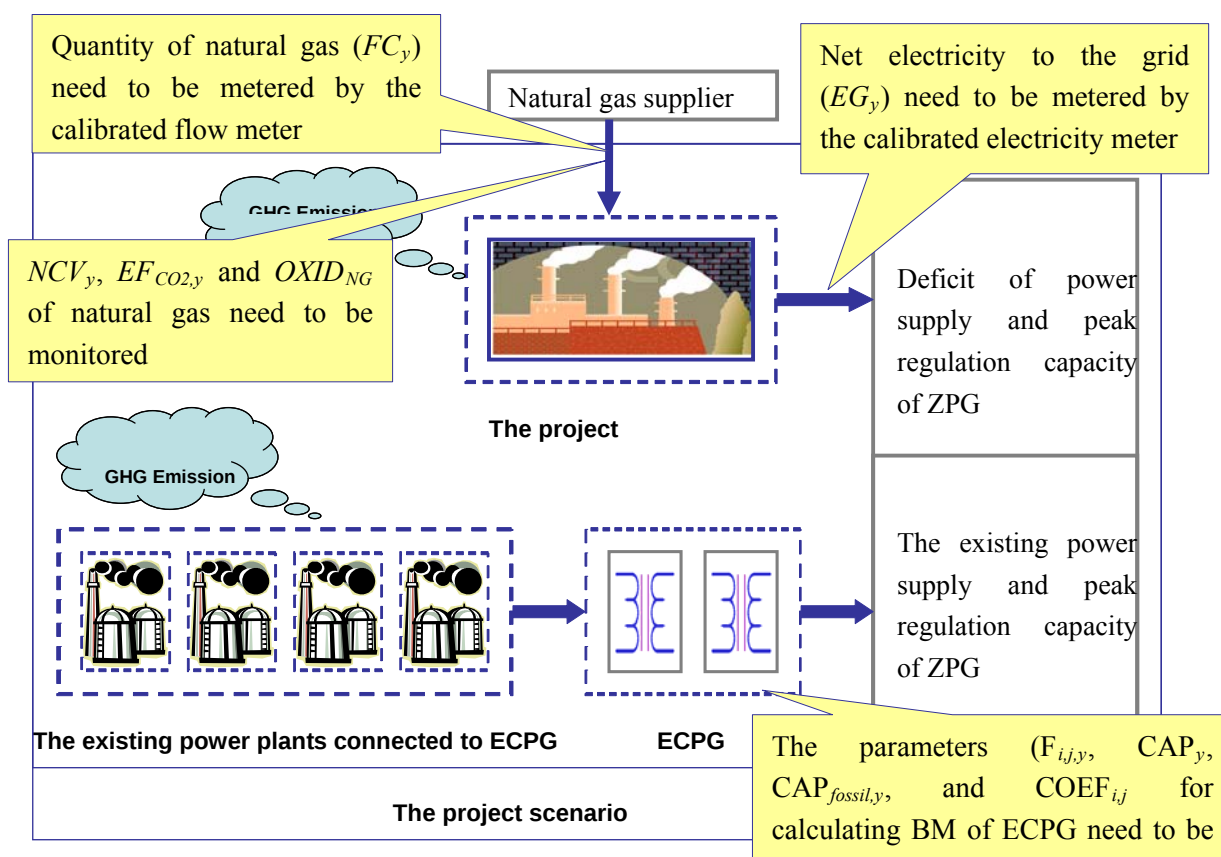
Equipment	manufacturer	Specification
Gas turbine	Harbin PRC	Serial No.: 298433 Model: MS9001FA Fuel type: natural gas Firing temperature: 1326.7 °C Ambient air pressure: 101.3
Steam turbine	Co-manufactured in Schenectady, NY, USA and Harbin PRC	Serial No.: 270T574 Steam pressure: 9566 kPa Steam temperature: 566 °C Exhaust pressure: 5.859 kPa
Generator	Schenectady, NY, USA	Serial No.: 290T574 Hydrogen-cooled 2 poles, 3 phase, 50 Hertz, 98% Purity, 60 PSIG
DCS	Emerson, USA	Can record an archive automatically the readings which transferred from the natural gas flow meters and electricity meters electronically.

5. Monitoring methodology and Monitoring Plan

Methodology used in the PDD is the approved Baseline and Monitoring Methodology AM0029/ Version 3: “Baseline Methodology for Grid Connected Electricity Generation project using Natural Gas” and “Monitoring methodology for grid connected generation plants using non-renewable and less GHG intensive fuel”, and available up to now. The Monitoring Plan described in the PDD is briefly stated as below:

5.1 Monitoring parameters

According to the methodology and the PDD, the parameters need to be monitored can illustrated as below:



According to the methodology and the PDD, the detailed description of these monitoring parameters as follows:

ID number	Data variable	Source of data	Data unit	Recording frequency
1. FC_y	Quantity of natural gas consumed in the project activity in year y	Fuel flow meter reading at project boundary	Nm^3	Daily
2. NCV_y	Net calorific value of natural gas	Fuel supplier	MJ/Nm^3	Fortnightly
3. $EF_{CO_2,y}$	CO_2 emission factor of	IPCC	tCO_2/TJ	Annually

	natural gas in year y			
$4.OXID_{NG}$	Oxidation factor of natural gas	<i>IPCC</i>	---	Annually
$5.EG_y$	Net electricity delivered to the grid by project activity in year y	Electricity meters reading at project boundary	MWh	Daily
$6.F_{ij,y}$	The amount of fuel i consumed by province j in ECPG in year y	<i>China Energy Statistics Yearbook</i>	tonne or Nm ³	Annually
$7.COEF_{ij}$	The emission coefficient of fuel i consumed by province j in ECPG in year y	<i>China Energy Statistics Yearbook and IPCC</i>	tCO ₂ /tonne or Nm ³	Annually
$8.CAP_y$	The installed capacity of all types power units within ECPG in year y	<i>China Electric Power Yearbook</i>	MW	Annually
$9.CAP_{fossil,y}$	The installed capacity of all fossil fuel fired power units within ECPG in year y	<i>China Electric Power Yearbook</i>	MW	Annually

5.2 Measuring instruments

All measuring instruments should be calibrated or recalibrated by the officially accredited entities as per the national standards. The detailed information as follows:

Name	Monitored Parameter	Frequency for calibration	Frequency for recalibration	National standards
Gas flow meters	FC_y	Every six years	Annually	JJG198-1994 JJG 1030-2007
Electricity meters	EG_y	Every five years	Annually	JJG 596-1999

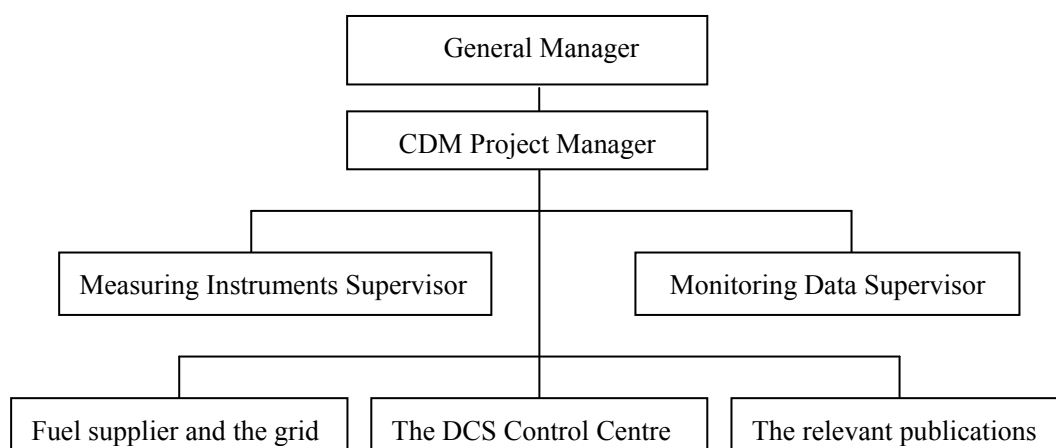
5.3 QA and QC Procedures undertaken for data monitoring

Data	Uncertainty level of data	QA/QC procedures undertaken for data monitoring
$1.EG_y$	Low	Measured using electricity meter which designed accuracy is 0.2S level. The readings can be measured continuously and recorded daily and monthly by the DCS, and can be double-checked by the historical data measured by the grid and the relevant issued invoices. The electricity meters should be calibrated every five years as per the national standard: JJG 596-1999, and subject to regular maintenance and testing in accordance with stipulation of the applicable industry, national standards and relevant agreements

		to ensure accuracy.
$2.FC_y$	Low	Measured using gas flow meter which designed accuracy is 0.2%. The readings can be measured continuously and recorded daily and monthly by the DCS, and can be double-checked by the historical data measured by the natural gas supplier and the relevant issued invoices. The gas flow meters should be calibrated every three years as per the national standard JJG 198-1994 prior to 21/11/2007 and every six years as per the national standard: JJG 1030-2007 since 21/11/2007, and subject to regular maintenance and testing in accordance with stipulation of the applicable industry, national standards and relevant agreements to ensure accuracy.
$3. NCV_y$	Low	No additional QA/QC procedures may need to be planned.
$4. EF_{CO2,y}$	Low	
$5. OXID_{NG}$	Low	
$6. F_{ij,y}$	Low	
$7. COEF_{ij}$	Low	
$8. CAP_y$	Low	
$9. CAP_{fossil,y}$	Low	

5.4 Management and Improvement

Huaxing has established a specialized CDM Project Management Department to be fully responsible for the project. The relevant organization structure of monitoring management is shown as below:



Where,

CDM Project Manager is responsible for directing all the routing monitoring work of the project, including data reading, recording, archiving, measuring instruments calibration and recalibration, MR completing and MP periodically reviewing and sustained improving.

Monitoring Data Supervisor is responsible for supervising all monitoring data for fulfilling reading, recording, reviewing and archiving which come from the DCS Control Centre, the natural gas supplier, the power grid company and the relevant publications (including IPCC, China Electric Power Yearbook and China Energy Statistics Yearbook).

Measuring Instruments Supervisor is responsible for supervising to fulfill accurately the calibration, recalibration and routing repair and maintenance of the measuring instruments

All staff involved in any procedures related with the project have been trained prior to the start of this monitoring period to ensure fulfilling the eligible emission reductions.

All electronic data have been archived by the computer system and the copies have been archived into the other electronic storage medium. Paper documents, such as purchase and sales invoices, their scanned files have also been archived into the electronic storage medium. Data records will be archived for a period of two years after the credit period to which the records pertain.

According to the DOE's comment, the management for data monitoring will be sustainable improvement. The internal audit to the MP of the project shall be conducted annually, and the review summary related with the improvement of MP should be included and reported in the last periodic MR of the crediting year.

6. MP implementation within the 1st monitoring period

6.1 Data monitoring

Natural gas consumption for the project (FC_y)

This parameter is metered and continuously by the calibrated gas flow meters and the readings are recorded timely, summed up hourly and daily and archived for a long time by the DCS automatically. These readings are also recorded in the monthly record sheets which are archived as hard copies. For security, monthly screen copies have been undertaken. Details refer to appendix01.

Net calorific value of natural gas (NCV_y)

This parameter is provided by the natural gas supplier and the readings are recorded in the daily report of natural gas provided by the supplier. The original copies of these reports are archived as well as the hard copies and the electronic scanned files for a long time. Details refer to appendix02.

Oxidation factor and emission factor of natural gas ($OXID_{NG}$) and $EF_{CO_2,y}$)

This parameter is sourced from the latest available publication (IPCC2006). Details refer to appendix03.

Quantity of electricity to the grid (EG_y)

This parameter is metered continuously by the calibrated electricity meters and the readings are recorded timely, summed up hourly and daily and archived for a long time by the DCS automatically. These readings are also recorded in the monthly record sheets which are archived as hard copies. For security, monthly screen copies have been undertaken. Details refer to appendix04.

The emission coefficient of fuel i consumed by province j in ECPG ($COEF_{ij}$)

This parameter is calculated as multiplying of net calorific value, emission factor and oxidation factor of the fuels. Net calorific value of fuel is sourced from the latest available publication (China Energy Statistics Yearbook 2008), and emission factor and oxidation factor of the fuel is sourced from the latest available publication (IPCC2006). Details refer to appendix05.

The amount of fuel i consumed by province j in ECPG ($F_{ij,y}$)

This parameter is sourced from the latest available publication (China Energy Statistics Yearbook 2008). Details refer to appendix06.

Installed capacity of fossil fuel fired and all types units within ECPG (CAP_y and $CAP_{fossil,y}$)

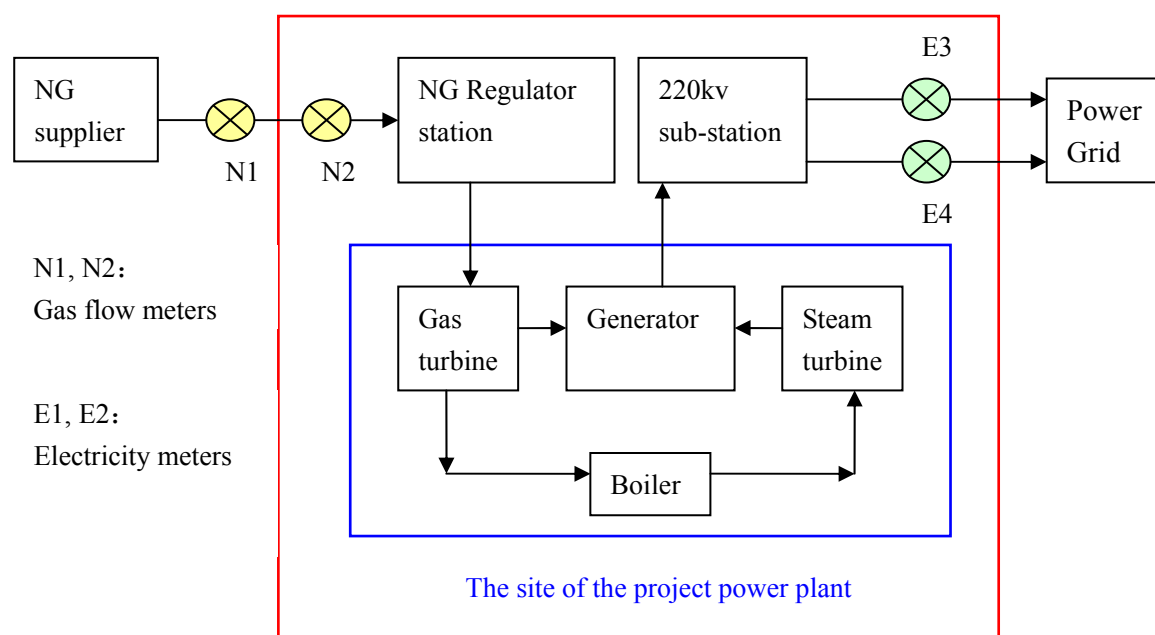
These parameters are sourced from the latest available publication (China Electric Power Yearbook 2008). Details refer to appendix07.

6.2 Calibration/Maintenance of the measuring instruments

For measuring the quantity of natural gas, two gas flow meters were used, one is on-line working and the other is on-line backup.

For measuring the quantity of electricity to the grid, two electricity meters were used and all on-line working..

The metering diagram of this project is as below:



All meters have been calibrated by the officially accredited entities prior and are valid in this monitoring period, the detailed information as below:

Name of instrument	Monitoring parameters	Serial number	Certificate number	Calibration date	Property right
Electricity meters	EG_y	085094019	JL-DX-2005-3864	16/02/2005	Power grid company
			JL-DX-2007-3050	27/11/2007	
		085094020	JL-DX-2005-3972	16/02/2005	
			JL-DX-2007-3051	27/11/2007	
Gas flow meters	FC_y	04-390251	2005032	18/05/2005	NG supplier
			GM2009130	28/06/2009	
		05-130079	2005031	18/05/2005	
			GM2008066	12/12/2008	

The officially accredited entities are: Chengdu Branch of China National Station of Petroleum and Natural Gas Measurement and Nanjing Branch of China National Station of Petroleum and Natural Gas Measurement which calibrated the gas flow meters, and Jiangsu Electric Power Research Institute Corporation Limited which calibrated the electricity meters.

In this monitoring period, there are no malfunction occurs for the above-mentioned measuring instruments, so there are no the corresponding repair records.

7. GHG Emission Reduction Calculations

7.1 Calculation of $EF_{BM,y}$ of ECPG in this monitoring period

According to the PDD, this parameter can be calculated as below:

$$EF_{BM,y} = \frac{\sum CAP_{fossil,y-s}}{\sum CAP_{y-s}} \times EF_{EL,fossil,y}$$

Where,

$\sum CAP_{fossil,y-s}$	Total capacity additions of fossil fuel fired power of ECPG from year s to year y
$\sum CAP_{y-s}$	Total capacity additions of ECPG from year s to year y
$EF_{BL,fossil,y}$	The emission factor for fossil fuel fired power of ECPG with the efficiency level of the best technology commercially available.
y	Mostly recent year that the relevant data can be obtained publicly.
s	This parameter is determined by: starting from year y , differences of the installed capacity of grid between year y and year $y-1$, year y and year $y-2$, ... year y and year $y-s$, year y and year $y-s-1$, ... are calculated respectively, and then divided by the installed capacity of y year. The year that can make the left-hand side of the following formula greater than 20% will be regarded as s . Formula is as follows: $\frac{\sum CAP_{y-s}}{\sum CAP_y} \geq 20\%$

In this monitoring period,

$$EF_{BM,y} = \frac{\sum CAP_{fossil,y-s}}{\sum CAP_{y-s}} \times EF_{BL,fossil,y} = 83.97\% \times 0.8129 = 0.6826 \text{ tCO}_2\text{e/MWh}$$

Details as follows:

Parameter	Data unit	Value	Reference
$EF_{BM,y}$	tCO ₂ e/MWh	0.6826	Calculated
$\frac{\sum CAP_{fossil,y-s}}{\sum CAP_{y-s}}$	--	83.97%	Appendix 07
$EF_{BL,fossil,y}$	tCO ₂ e/MWh	0.8129	Calculated

According to the PDD, $EF_{BL,fossil,y}$ can be calculated as below:

$$EF_{BL,fossil,Adv,y} = \lambda_{coal} \times EF_{coal,Adv,y} + \lambda_{oil} \times EF_{oil,Adv,y} + \lambda_{gas} \times EF_{gas,Adv,y}$$

Where,

λ_{coal}	The proportion of solid fuel emission accounted for total Emissions in ECPG
$EF_{coal,Adv,y}$	The emission coefficient of the coal-fired power unit based on the best technology level as commercial
λ_{oil}	The proportion of liquid fuel emission accounted for total Emissions in ECPG
$EF_{oil,Adv,y}$	The emission coefficient of the oil-fired power unit based on the best technology

	level as commercial
λ_{gas}	The proportion of gas fuel emission accounted for total Emissions in ECPG
$EF_{gas,Adv,y}$	The emission coefficient of the gas-fired power unit based on the best technology level as commercial

In this monitoring period,

$$EF_{BL,fossil,Adv,y} = \lambda_{coal} \times EF_{coal,Adv,y} + \lambda_{oil} \times EF_{oil,Adv,y} + \lambda_{gas} \times EF_{gas,Adv,y}$$

$$= 96.97\% \times 0.8249 + 0.72\% \times 0.5437 + 2.31\% \times 0.3910 = 0.8129 \text{ tCO}_2\text{e/MWh}$$

Details as follows:

Parameter	Data unit	Value	Reference
$EF_{BL,fossil,y}$	tCO ₂ e/MWh	0.8129	Calculated
$EF_{coal,Adv,y}$	tCO ₂ e/MWh	0.8249	The DNA of China
$EF_{oil,Adv,y}$	tCO ₂ e/MWh	0.5437	
$EF_{gas,Adv,y}$	tCO ₂ e/MWh	0.3910	
λ_{coal}	--	96.97%	Appendix 06
λ_{oil}	--	0.72%	Appendix 06
λ_{gas}	--	2.31%	Appendix 06

Note: <http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File2332.doc>

7.2 Calculation of BE_y in this monitoring period

According to the PDD, this parameter can be calculated as below:

$$BE_y = EG_y * EF_{BL,CO_2,y} = EG_y * EF_{BM,y}$$

Where:

BE_y	Baseline emissions in year y
EG_y	Net electricity to the grid by the project plant in year y .
$EF_{BL,CO_2,y}$	The baseline CO ₂ emission factor in year y

In this monitoring period,

$$BE_y = EG_y * EF_{BM,y} = 8,852,514.85 \times 0.6826 = 6,042,467 \text{ tCO}_2\text{e}$$

Details as follows:

Parameter	Data unit	Value	Reference
BE_y	tCO ₂ e	6,042,467	Calculated
EG_y	MWh	8,852,514.85	Appendix04
$EF_{BM,y}$	tCO ₂ /MWh	0.6826	Section 7.1 of this MR

7.3 Calculation of PE_y in this monitoring period

As per the PDD, PE_y can be calculated as below:

$$PE_y = FC_y \times COEF_y$$

Where:

PE_y	The project emissions in year y
FC_y	Quantity of natural gas combusted in the proposed project plant in year y .
$COEF_y$	The CO ₂ emission coefficient for natural gas in year y .

In this monitoring period,

$$PE_y = FC_y \times COEF_y = 1,762,729,420 \times 0.001891 = 3,334,595 \text{ tCO}_2\text{e}$$

Details as follows:

Parameter	Data unit	Value	Reference
PE_y	tCO ₂ e	3,334,595	Calculated
FC_y	Nm ³	1,762,729,420	Appendix 01
$COEF_y$	tCO ₂ /m ³	0.001891	Calculated

As per the PDD, $COEF_y$ can be calculated as below:

$$COEF_y = NCV_y \times EF_{CO_2,y} \times OXID_{NG}$$

Where,

$COEF_y$	The CO ₂ emission coefficient for natural gas in year y .
NCV_y	The net calorific value per volume unit of natural gas in year y
$OXID_{NG}$	The oxidation factor of natural gas
$EF_{CO_2,y}$	The CO ₂ emission factor per unit of energy of natural gas in year y

In this monitoring period,

$$COEF_y = NCV_y \times EF_{CO_2,y} \times OXID_{NG} = 33.7179 \times 56100 \times 1/10^9 = 0.001891 \text{ tCO}_2/\text{m}^3$$

Details as follows:

Parameter	Data unit	Value	Reference
$COEF_y$	tCO ₂ /Nm ³	0.001831	Calculated
NCV_y	MJ/Nm ³	33.7179	Appendix 02
$OXID_{NG}$	--	1	Appendix 03
$EF_{CO_2,y}$	tCO ₂ /PJ	56100	Appendix 03

7.4 Calculation of L_y in this monitoring period

As per PDD, leakage can be calculated as below:

$$L_y = (FC_y \times NCV_y \times EF_{NG,upstream,CH4} - EG_y * EF_{BL,upstream,CH4}) \times GWP_{CH4}$$

Where:

LE_y	Leakage emissions during the year y
FC_y	Quantity of natural gas combusted in the proposed project plant during the year y
NCV_y	Net calorific value of the natural gas combusted during the year y
$EF_{NG,upstream,CH4}$	Emission factor for upstream fugitive methane emissions of natural gas from production, transportation and distribution in tCH ₄ per GJ fuel supplied to final consumers.
EG_y	Electricity generation in the proposed project plant during the year y
GWP_{CH4}	Global warming potential of methane valid for the relevant commitment period.
$EF_{BL,upstream,CH4}$	Emission factor for upstream fugitive methane emissions occurring in the absence of the proposed project activity in tCH ₄ per MWh electricity generation in the proposed project plant.

In this monitoring period,

$$L_y = (FC_y \times NCV_y \times EF_{NG,upstream,CH4} - EG_y * EF_{BL,upstream,CH4}) \times GWP_{CH4}$$

$$= (1,762,729,420 \times 33.7179 \times 296 / 10^9 - 8,852,514.85 \times 0.004927) \times 21 = -546,440 \text{ tCO}_2\text{e}$$

According to the methodology, if calculated $LE_y < 0$, then should be assumed $LE_y = 0$

Details as follows:

Parameter	Data unit	Value	Reference
LE_y	t-CO ₂ e	-546,440	Calculated
FC_y	Nm ³	1,762,729,420	Appendix 01
NCV_y	MJ/Nm ³	33.7179	Appendix 02
$EF_{NG,upstream,CH4}$	tCH ₄ /PJ	296	IPCC 2006
EG_y	MWh	8,852,514.85	Appendix 04
GWP_{CH4}	tCO ₂ e/tCH ₄	21	IPCC 2006
$EF_{BL,upstream,CH4}$	tCH ₄ /MWh	0.004927	Calculated

As per the PDD, $COEF_y$ can be calculated as below:

$$EF_{BL,upstream,CH4} = \frac{\sum CAP_{fossil,y-s}}{\sum CAP_{y-s}} \times \lambda_{coal} \times CC_{coal,Adv} \times EF_{Coal,upstream,CH4} \times \frac{NCV_{coal}}{NCV_{Raw\ coal}}$$

Where,

$\frac{\sum CAP_{fossil,y-s}}{\sum CAP_{y-s}}$	The share of the incremental installed capacity of coal-fired power in the recent 20% incremental installed capacity of all type powers in ECPG.
λ_{coal}	The proportion of solid fuel emission account for total Emissions in ECPG.
$CC_{coal\ Adv}$	The standard coal consumption of the best technology commercially available

	of coal-fired power generation within the grid boundary
$EF_{coal,upstream,CH4}$	The emission factor for fugitive upstream emissions for raw coal underground mining.
$\frac{NCV_{coal}}{NCV_{rawcoal}}$	The net caloric value of standard coal/ the net caloric value of raw coal.

In this monitoring period,

$$EF_{BL,upstream,CH4} = \frac{\sum CAP_{fossil,y-s}}{\sum CAP_{y-s}} \times \lambda_{coal} \times CC_{coal,Adv} \times EF_{Coal,upstream,CH4} \times \frac{NCV_{coal}}{NCV_{Raw coal}}$$

$$= 83.97\% \times 96.97\% \times 322.5 \times 13.4 \times 1.4/10^6 = 0.004927 \text{ tCH}_4/\text{MWh}$$

Details as follows:

Parameter	Data unit	Value	Reference
$EF_{BL,upstream,CH4}$	tCH ₄ /MWh	0.004927	Calculated
$\frac{\sum CAP_{fossil,y-s}}{\sum CAP_{y-s}}$	--	83.97%	Appendix 07
λ_{coal}	--	96.97%	Appendix 06
$CC_{coal Adv}$	gce/kWh	322.5	The DNA of China
$EF_{coal,upstream,CH4}$	tCH ₄ /kt	13.4	AM0029
$\frac{NCV_{coal}}{NCV_{rawcoal}}$	--	1.4	The PDD

Note: <http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File2332.doc>

7.5 Calculation of ER_y in this monitoring period

As per PDD, ER_y can be calculated as below:

$$ER_y = BE_y - PE_y - L_y$$

In this monitoring period,

$$ER_y = BE_y - PE_y - L_y = 6,042,467 - 3,334,595 - 0 = 2,707,872 \text{ tCO}_2\text{e}$$

Details as follows:

Parameter	Data unit	Value	Reference
ER_y	tCO ₂ e	2,707,872	Calculated
BE_y	tCO ₂ e	6,042,467	Section 7.2 of this MR
PE_y	tCO ₂ e	3,334,595	Section 7.3 of this MR
L_y	tCO ₂ e	0	Section 7.4 of this MR

8. VCS requirement

According to Policy Announcement from the VCS Association, when a project has been validated under the CDM, a further validation shall be completed of clauses 1.12, 1.13, 1.14, 8.1 and 8.2 of the VCS Project Description template, Hereby, the project against to these requirements can be done as follows:

Clause 1.12: Demonstration to confirm that the project was not implemented to create GHG emissions primarily for the purpose of its subsequent removal or destruction.

According to the FSR Approval of the project (Decree No. 1525 of Fagaishenpi [2003]) which issued by the NDRC on 20/10/2003, the project was implemented to provide electricity and peak regulation service to ECPG mainly, other than implemented to create GHG emissions primarily for the purpose of its subsequent removal or destruction.

Clause 1.13: Demonstration that the project has not created another form of environmental credit (for example renewable energy certificates)

The project has been registered as the CDM project in UNFCCC on 11/09/2009 and the crediting starting date is 11/09/2009, which means the credit which be issued after 11/09/2009 shall be used as a CDM credit. However, the project proponent chose a clear VCS crediting period from 08/06/2005 to 10/09/2009 which is not created another form of environment credit.

Clause 1.14: Project rejected under other GHG programs (if applicable)

Not applicable.

Clause 8.1: Proof of Title

Zhangjiagang Huaxing Power Co., Ltd., a power generation company based in Zhangjiagang City of Jiangsu Province of P.R. China, which is the owner of the project power plant, the equipment or process that grants all reductions/removals to the proponent, this can be evidenced by the LOA of the project (Decree No. 3585 of Fagaiqihou [2007]) which issued by the DNA of China on 20/12/2007, the FSR Approval of the project (Decree No. 1525 of Fagaishenpi [2003]) which issued by the NDRC on 20/10/2003 and the EIA Approval of the project (Decree No. 229 of Huanshen [2002]) which issued by the State Environmental Protection Administration of China on 24/08/2002.

Clause 8.2: Projects that reduce GHG emissions from activities that participate in an emissions trading program (if applicable)

The project has been registered as the CDM project in UNFCCC on 11/09/2009 and the crediting starting date is 11/09/2009, which means the credit which be issued after 11/09/2009 shall be used as a CDM credit. The project owner has issued a claiming letter that they ensure that the emission reductions generated from the beginning of trial production of the project (08/06/2005) to the date before the CDM registration of the project (11/09/2009) shall be only exchanged in VCS Market, and the emission reductions generated after the registration date (11/09/2009) shall be only exchanged in CDM Market.

Appendix 01

Name of item	FC_y
Description	Quantity of natural gas combusted in the project plant
Value in period	1,762,729,420 Nm³
Method of monitoring	Metered by gas flow meters
Accuracy of meter	±0.2%
Recording frequency	Hourly
Background data	Log sheet record

In this monitoring period, quantity of natural gas is summed as follows:

Date/Month/Year	Data unit	Value
From 08/06/2005 to 31/12/2005	Nm ³	73,217,200
From 01/01/2006 to 31/12/2006	Nm ³	418,280,270
From 01/01/2007 to 31/12/2007	Nm ³	483,647,820
From 01/01/2008 to 31/12/2008	Nm ³	428,956,790
From 01/01/2009 to 10/09/2009	Nm ³	358,627,340
total in this monitoring period	Nm ³	1,762,729,420

The weekly summed data for the quantity of natural gas is consistent with the corresponding issued invoices.

Appendix 02

Name of item	NCV_y
Description	Net calorific value of natural gas used by the project
Value in period	33.7179 MJ/Nm³
Recording frequency	daily
Background data	Daily report provided by the natural gas supplier
Calculation method	Weighted average based on fortnightly data

In this monitoring period, weighted average NCV of natural gas can be calculated as follows:

Date/Month/Year	Fortnightly Fuel consumption (Nm ³)	Fortnight NCV value (MJ/Nm ³)	FC*NCV(MJ)
08/06/2005 to 18/06/2005	5,207,750	33.4100	173,990,927.50
19/06/2005 to 02/07/2005	14,916,130	33.7580	503,538,716.54
03/07/2005 to 16/07/2005	2,543,780	34.1705	86,922,234.49
17/07/2005 to 30/07/2005	3,786,740	34.1926	129,478,486.12
31/07/2005 to 13/08/2005	5,035,440	34.1713	172,067,530.87
14/08/2005 to 27/08/2005	2,298,760	34.0949	78,375,992.32
28/08/2005 to 10/09/2005	9,457,670	33.9237	320,839,159.78
11/09/2005 to 24/09/2005	3,397,510	34.5159	117,268,115.41
25/09/2005 to 08/10/2005	1,198,180	34.6977	41,574,090.19
09/10/2005 to 22/10/2005	999,650	34.8332	34,821,008.38
23/10/2005 to 05/11/2005	8,250,960	34.7020	286,324,813.92
06/11/2005 to 19/11/2005	9,064,350	33.5640	304,235,843.40
20/11/2005 to 03/12/2005	3,163,260	33.2689	105,238,180.61
04/12/2005 to 17/12/2005	1,997,380	33.3282	66,569,080.12
18/12/2005 to 31/12/2005	1,899,640	33.3149	63,286,316.64
Subtotal and weighted average in 2005	73,217,200	33.9337	2,484,530,496.29
01/01/2006 to 14/01/2006	15,589,960	33.4600	521,640,061.60
15/01/2006 to 28/01/2006	11,414,180	33.4134	381,386,562.01
29/01/2006 to 11/02/2006	9,853,800	33.4308	329,420,417.04
12/02/2006 to 25/02/2006	13,821,040	33.5291	463,407,032.26
26/02/2006 to 11/03/2006	21,575,600	33.5775	724,454,709.00
12/03/2006 to 25/03/2006	16,411,980	33.5154	550,054,074.49
26/03/2006 to 08/04/2006	16,536,600	33.7277	557,741,483.82
09/04/2006 to 22/04/2006	16,065,000	33.4408	537,226,452.00
23/04/2006 to 06/05/2006	17,644,530	33.4166	589,620,201.20
07/05/2006 to 20/05/2006	18,694,360	33.4251	624,860,852.44
21/05/2006 to 03/06/2006	15,548,870	33.4436	520,010,188.73
04/06/2006 to 17/06/2006	20,358,800	33.4680	681,368,318.40
18/06/2006 to 01/07/2006	22,758,830	33.5090	762,625,634.47

02/07/2006 to 15/07/2006	18,517,900	33.4729	619,847,814.91
16/07/2006 to 29/07/2006	21,929,540	33.4741	734,071,614.91
30/07/2006 to 12/08/2006	27,850,400	33.4901	932,712,681.04
13/08/2006 to 26/08/2006	23,022,900	33.7094	776,088,145.26
27/08/2006 to 09/09/2006	10,952,470	33.6656	368,721,474.03
10/09/2006 to 23/09/2006	21,291,510	33.4946	713,150,610.85
24/09/2006 to 07/10/2006	23,972,170	33.2207	796,372,267.92
08/10/2006 to 21/10/2006	22,352,430	33.4448	747,572,550.86
22/10/2006 to 04/11/2006	20,689,870	33.4667	692,421,672.33
05/11/2006 to 18/11/2006	9,634,490	33.4160	321,946,117.84
19/11/2006 to 02/12/2006	598,250	33.4396	20,005,240.70
03/12/2006 to 16/12/2006	597,540	33.5626	20,054,996.00
17/12/2006 to 31/12/2006	597,250	33.4392	19,971,562.20
Subtotal and weighted average in 2006	418,280,270	33.4865	14,006,752,736.32
01/01/2007 to 13/01/2007	597,010	33.3838	19,930,462.44
14/01/2007 to 27/01/2007	597,940	33.3779	19,957,981.53
28/01/2007 to 10/02/2007	11,483,450	33.3796	383,312,967.62
11/01/2007 to 24/02/2007	20,198,660	33.3792	674,215,111.87
25/02/2007 to 10/03/2007	22,665,130	33.1767	751,954,218.47
11/03/2007 to 24/03/2007	16,835,260	33.4048	562,378,493.25
25/03/2007 to 07/04/2007	23,461,810	33.3945	783,495,414.05
08/04/2007 to 21/04/2007	20,863,180	33.4392	697,648,048.66
22/04/2007 to 05/05/2007	22,572,190	33.4529	755,105,214.85
06/05/2007 to 19/05/2007	19,786,420	33.5916	664,657,506.07
20/05/2007 to 02/06/2007	17,155,520	33.5305	575,233,163.36
03/06/2007 to 16/06/2007	19,991,010	33.6403	672,503,573.70
17/06/2007 to 30/06/2007	21,800,670	33.7169	735,051,010.32
01/07/2007 to 14/07/2007	28,894,190	33.7936	976,438,699.18
15/07/2007 to 28/07/2007	29,704,850	33.8240	1,004,736,846.40
29/07/2007 to 11/08/2007	32,806,380	33.8938	1,111,932,882.44
12/08/2007 to 25/08/2007	29,749,440	33.8082	1,005,775,017.41
26/08/2007 to 08/09/2007	26,302,040	33.7847	888,606,530.79
09/09/2007 to 22/09/2007	16,033,190	33.9281	543,975,673.64
23/09/2007 to 06/10/2007	5,424,540	33.7634	183,150,913.84
07/10/2007 to 20/10/2007	12,781,250	33.6859	430,547,909.38
21/10/2007 to 03/11/2007	10,771,940	33.7055	363,073,623.67
04/11/2007 to 17/11/2007	18,441,420	33.7263	621,960,863.35
18/11/2007 to 01/12/2007	15,399,050	33.7612	519,890,406.86
02/12/2007 to 15/12/2007	16,520,090	33.7389	557,369,664.50
16/12/2007 to 29/12/2007	19,112,820	33.8307	646,600,079.57
30/12/2007 to 31/12/2007	3,698,370	33.7622	124,865,107.61
Subtotal and weighted average in 2007	483,647,820	33.6588	16,278,996,292
01/01/2008 to 12/01/2008	12,243,760	33.7622	413,376,273.87

13/01/2008 to 26/01/2008	7,442,850	33.8266	251,766,309.81
27/01/2008 to 09/02/2008	3,540,210	33.8471	119,825,841.89
10/02/2008 to 23/02/2008	12,211,270	33.8098	412,860,596.45
24/02/2008 to 08/03/2008	22,424,540	33.8284	758,586,308.94
09/03/2008 to 22/03/2008	18,763,160	33.7320	632,918,913.12
23/03/2008 to 05/04/2008	18,620,630	33.7786	628,978,812.52
06/04/2008 to 19/04/2008	17,043,620	33.7999	576,072,651.64
20/04/2008 to 03/05/2008	9,365,190	33.8069	316,608,041.81
04/05/2008 to 17/05/2008	22,613,650	33.7783	763,850,653.80
18/05/2008 to 31/05/2008	32,858,450	33.6785	1,106,623,308.33
01/06/2008 to 14/06/2008	16,314,860	33.7066	549,918,460.08
15/06/2008 to 28/06/2008	19,513,970	33.7476	658,549,653.97
29/06/2008 to 12/07/2008	19,952,760	33.8444	675,289,190.54
13/07/2008 to 26/07/2008	18,736,830	33.8527	634,292,284.94
27/07/2008 to 09/08/2008	18,109,360	33.8793	613,532,440.25
10/08/2008 to 23/08/2008	17,242,470	33.8740	584,071,428.78
24/08/2008 to 06/09/2008	19,010,170	33.9075	644,587,339.28
07/09/2008 to 20/09/2008	18,451,560	33.8853	625,236,646.07
21/09/2008 to 04/10/2008	10,665,310	33.9152	361,716,121.71
05/10/2008 to 18/10/2008	24,711,090	34.1438	843,730,514.74
19/10/2008 to 01/11/2008	22,159,860	33.9977	753,384,272.32
02/11/2008 to 15/11/2008	19,496,710	33.8847	660,640,169.34
16/11/2008 to 29/11/2008	5,788,560	33.7835	195,557,816.76
30/11/2008 to 13/12/2008	10,136,560	33.8723	343,348,601.29
14/12/2008 to 27/12/2008	8,051,230	33.8339	272,404,510.70
28/12/2008 to 31/12/2008	3,488,160	33.8595	118,107,353.52
Subtotal and weighted average in 2008	428,956,790	33.8399	14,515,834,516.44
01/01/2009 to 10/01/2009	8,156,680	33.8595	276,181,106.46
11/01/2009 to 24/01/2009	9,091,500	33.7930	307,229,059.50
25/01/2009 to 07/02/2009	11,790,290	33.8290	398,853,720.41
08/02/2009 to 21/02/2009	16,381,340	33.8625	554,713,125.75
22/02/2009 to 07/03/2009	19,583,400	33.8608	663,109,590.72
08/03/2009 to 21/03/2009	21,038,300	33.8769	712,712,385.27
22/03/2009 to 04/04/2009	21,237,930	33.8424	718,742,522.23
05/04/2009 to 18/04/2009	26,730,240	33.8007	903,500,823.17
19/04/2009 to 02/05/2009	23,286,570	33.8079	787,270,029.90
03/05/2009 to 16/05/2009	22,976,510	33.8209	777,086,247.06
17/05/2009 to 30/05/2009	26,519,310	33.8533	897,766,157.22
31/05/2009 to 13/06/2009	31,675,180	33.9409	1,075,084,116.86
14/06/2009 to 27/06/2009	32,230,390	33.9079	1,092,864,841.08
28/06/2009 to 11/07/2009	21,983,400	33.9663	746,694,759.42
12/07/2009 to 25/07/2009	24,381,510	33.9996	828,961,587.40
26/07/2009 to 08/08/2009	17,517,230	33.9765	595,174,165.10

09/08/2009 to 22/08/2009	11,729,950	34.0182	399,031,785.09
23/08/2009 to 05/09/2009	10,689,400	34.0344	363,807,315.36
06/09/2009 to 10/09/2009	1,628,210	33.9667	55,304,920.61
subtotal and weighted average in 2009	358,627,340	33.8906	12,154,088,258.61
Total	1,762,729,420		59,435,490,219
NCV_y for weighted average (MJ/Nm³)	$NCV = Total_FC * NCV / Total_FC$		33.7179

Appendix 03

Name of item	$OXID_{NG}$ and $EF_{CO_2,y}$
Description	The oxidation factor and emission factor of natural gas
Value in period	1 and 56100 tCO₂/PJ
Recording frequency	Annually
Background data	IPCC 2006

In this monitoring period, the oxidation factor of natural gas used for calculation is chosen to be 1, the same as the value in the PDD.

In this monitoring period, the emission factor of natural gas used for calculation is chosen to be 56100 tCO₂/PJ as per the PDD.

The above values are all sourced from table 1.4 of 2006 IPCC Guidelines for National Greenhouse Gas Inventories” Volume 2 Energy.

Appendix 04

Name of item	EG_y
Description	Net electricity to the grid by the project plant
Value in period	8,852,514.85 MWh
Method of monitoring	Metered by the electricity meters
Accuracy of meter	0.2S
Recording frequency	Daily
Background data	Log sheet record

In this monitoring period, EG_y is summed as follows:

Date/Month/Year	Data unit	To Grid	From Grid	Net Electricity to Grid
08/06/2005 - 30/06/2005	MWh	89,984.400	2,135.100	87,849.300
01/07/2005 - 31/07/2005	MWh	25,357.200	999.900	24,357.300
01/08/2005 - 31/08/2005	MWh	45,279.300	1,098.900	44,180.400
01/09/2005 - 30/09/2005	MWh	54,106.800	900.900	53,205.900
01/10/2005 - 31/10/2005	MWh	37778.400	1,032.900	36,745.500
01/11/2005 - 30/11/2005	MWh	73,580.100	1,128.600	72,451.500
01/12/2005 - 31/12/2005	MWh	15,427.500	1,280.400	14,147.100
Subtotal in 2005	MWh			332,937.000
01/01/2006 - 31/01/2006	MWh	141,682.200	891.000	140,791.200
01/02/2006 - 28/02/2006	MWh	140,461.200	891.000	139,570.200
01/03/2006 - 31/03/2006	MWh	202,326.300	478.500	201,847.800
01/04/2006 - 30/04/2006	MWh	181,331.700	178.200	181,153.500
01/05/2006 - 31/05/2006	MWh	179,609.100	46.200	179,562.900
01/06/2006 - 30/06/2006	MWh	236,893.800	23.100	236,870.700
01/07/2006 - 31/07/2006	MWh	222,878.700	323.400	222,555.300
01/08/2006 - 31/08/2006	MWh	266,871.000	29.700	266,841.300
01/09/2006 - 30/09/2006	MWh	182,519.700	46.200	182,473.500
01/10/2006 - 31/10/2006	MWh	258,545.100	29.700	258,515.400
01/11/2006 - 30/11/2006	MWh	78,239.700	99.000	78,140.700
01/12/2006 - 31/12/2006	MWh	4,973.100	112.200	4,860.900
Subtotal in 2006	MWh			2,093,183.400
01/01/2007 - 31/01/2007	MWh	15,067.800	62.700	15,005.100
01/02/2007 - 28/02/2007	MWh	196,383.000	112.200	196,270.800
01/03/2007 - 31/03/2007	MWh	209,312.400	250.800	209,061.600
01/04/2007 - 30/04/2007	MWh	244,767.600	66.000	244,701.600
01/05/2007 - 31/05/2007	MWh	209,691.900	19.800	209,672.100
01/06/2007 - 30/06/2007	MWh	227,528.400	23.100	227,505.300
01/07/2007 - 31/07/2007	MWh	319,397.100	39.600	319,357.500
01/08/2007 - 31/08/2007	MWh	362,607.300	0	362,607.300

01/09/2007 - 30/09/2007	MWh	164,112.300	125.400	163,986.900
01/10/2007 - 31/10/2007	MWh	117,318.300	531.300	116,787.000
01/11/2007 - 30/11/2007	MWh	184,060.800	211.200	183,849.600
01/12/2007 - 31/12/2007	MWh	202,019.400	369.600	201,649.800
Subtotal in 2007	MWh			2,450,454.600
01/01/2008 - 31/01/2008	MWh	108,093.480	1,053.756	107,039.724
01/02/2008 - 29/02/2008	MWh	104,747.000	761.100	103,985.900
01/03/2008 - 31/03/2008	MWh	227,008.056	522.720	226,485.336
01/04/2008 - 30/04/2008	MWh	153,585.564	195.360	153,390.204
01/05/2008 - 31/05/2008	MWh	301,840.656	0.924	301,839.732
01/06/2008 - 30/06/2008	MWh	197,417.350	101.772	197,315.578
01/07/2008 - 31/07/2008	MWh	214,696.290	51.480	214,644.810
01/08/2008 - 31/08/2008	MWh	195,037.524	92.004	194,945.520
01/09/2008 - 30/09/2008	MWh	176,491.524	78.012	176,413.512
01/10/2008 - 31/10/2008	MWh	244,023.65	45.804	243,977.846
01/11/2008 - 30/11/2008	MWh	139,640.600	152.700	139,487.900
01/12/2008 - 31/12/2008	MWh	111,062.950	119.460	110,943.490
Subtotal in 2008	MWh			2,170,469.552
01/01/2009 - 31/01/2009	MWh	103,930.900	345.000	103,585.900
01/02/2009 - 28/02/2009	MWh	174,118.164	346.236	173,771.928
01/03/2009 - 31/03/2009	MWh	237,530.832	195.800	237,335.032
01/04/2009 - 30/04/2009	MWh	275,059.752	114.576	274,945.176
01/05/2009 - 31/05/2009	MWh	268,918.584	138.468	268,780.116
01/06/2009 - 30/06/2009	MWh	331,342.170	0	331,342.170
01/07/2009 - 31/07/2009	MWh	249,489.240	266.376	249,222.864
01/08/2009 - 31/08/2009	MWh	147,364.800	772.332	146,592.468
01/09/2009 - 10/09/2009	MWh	20,260.812	366.168	19,894.644
Subtotal in 2009	MWh			1,805,470.298
Total EG _y provided by the grid	MWh			8,852,514.850

The monthly summed data for the quantity of electricity from or to the grid is consistent with the corresponding issued invoices.

Appendix 05

Name of item	$COEF_{ij}$
Description	Emission coefficient of fuel i consumed by province j in ECPG
Recording frequency	Annually
Background data	China Energy Statistics Yearbook 2008 and IPCC 2006
Calculation method	The emission coefficient is calculated as multiplying of the net calorific value, the emission factor and the oxidation factor:

$$COEF_{ij} = NCV_{ij} \times EF_{CO_2,ij} \times OXID_{ij}$$

In this monitoring period, Emission coefficient of fuels can be calculated as below:

Fuel	NCV		Emission factor (kgCO ₂ /TJ)	Oxidation factor	$COEF_{ij}$ (kgCO ₂ /kg or m ³)
	Unit	value			
Raw Coal	kJ/kg	20,908	87,300	1	1825268400
Cleaned Coal	kJ/kg	26,344	87,300	1	2299831200
Other Washed Coal	kJ/kg	8,363	87,300	1	730089900
Briquette Coal	kJ/kg	20,908	87,300	1	1825268400
Coke	kJ/kg	28,435	95,700	1	2721229500
Crude Oil	kJ/kg	41,816	71,100	1	2973117600
Gasoline	kJ/kg	43,070	67,500	1	2907225000
Diesel Oil	kJ/kg	42,652	72,600	1	3096535200
Fuel Oil	kJ/kg	41,816	75,500	1	3157108000
Other oil products	kJ/kg	41,816	75,500	1	3157108000
Natural Gas	kJ/m ³	38,931	54,300	1	2113953300
Coke Oven Gas	kJ/m ³	16,726	37,300	1	623879800
Other Coal Gas	kJ/m ³	5,227	37,300	1	194967100
LPG	kJ/kg	50,179	61,600	1	3091026400
Refinery Gas	kJ/kg	46,055	48,200	1	2219851000
Data source:					
NCV of fuels are sourced from page 238 of <i>China Energy Statistics Yearbook 2008</i>					
Emission factor and oxidation factor of fuels are sourced from table 1.4 of <i>2006 IPCC Guidelines for National Greenhouse Gas Inventories" Volume 2 Energy</i> , in particular, emission factor of fuels are chosen to be lower of 95% confidence interval.					

Appendix 06

Name of item	$F_{i,j,y}$
Description	The amount of fuel i consumed by province j in ECPG
Recording frequency	Annually
Background data	<i>China Energy Statistics Yearbook 2008</i>

In this monitoring period, the amount of fuel i consumed by province j in ECPG as below:

Fuel	Data unit	Shanghai	Jiangsu	Zhejiang	Anhui	Fujian	Total	$COEF_{ij}$	Emissions
Raw Coal	10 ⁴ tonne	2,754.04	11,060.80	7,350	3,929.90	3,097.87	28,192.61	1,825,268,400	514,590,801
Cleaned Coal	10 ⁴ tonne	0	0	0	0	0	0.00	2,299,831,200	0
Other Washed Coal	10 ⁴ tonne	0	459.17	0	29.32	0	488.49	730,089,900	3,566,416
Briquette Coal	10 ⁴ tonne	0	0	0	0	0	0.00	1,825,268,400	0
Coke	10 ⁴ tonne	0	0	35.06	0	0	35.06	2,721,229,500	954,063
Sum up for solid fuels									519,111,281
Crude Oil	10 ⁴ tonne	0	0	15.15	0	0	15.15	2,973,117,600	450,427
Gasoline	10 ⁴ tonne	0	0	0	0	0	0.00	2,907,225,000	0
Diesel Oil	10 ⁴ tonne	1.23	5.37	2.76	0	1.01	10.37	3,096,535,200	321,111
Fuel Oil	10 ⁴ tonne	40.76	1.55	29.52	0	2.04	73.87	3,157,108,000	2,332,156
Other petroleum products	10 ⁴ tonne	20.39	2.78	0	0	0	23.17	3,157,108,000	731,502
Sum of liquid fuels									3,835,196
Natural Gas	10 ⁸ m ³	46.1	191.7	110.1	0	0	347.90	2,113,953,300	7,354,444
Coke Oven Gas	10 ⁸ m ³	8.9	97.3	2.2	15.6	7.5	131.50	623,879,800	820,402
Other Coal Gas	10 ⁸ m ³	989.2	704.5	34.1	363	17.1	2,107.90	194,967,100	4,109,712
LPG	10 ⁴ tonne	0	0	0	0	0	0.00	3,091,026,400	0
Refinery Gas	10 ⁴ tonne	0.2	0.63	0	2.55	0	3.38	2,219,851,000	75,031
Sum of gaseous fuels									12,359,588
Total									535,305,699

Data source: *China Electric Power Yearbook 2008*

Based on data stated in the above tableA, the share of CO₂ emissions from solid, liquid and gaseous fuels can be calculated as follows:

$$\lambda_{coal} = 519,111,281/535,306,064 = 96.97\%$$

$$\lambda_{oil} = 3,835,196/535,306,064 = 0.72\%$$

$$\lambda_{gas} = 12,359,588/535,306,064 = 2.31\%$$

Appendix 07

Name of item	$CAP_{fossil,y}$ and CAP_y
Description	The installed capacity of all fossil fuel fired power units and all types power units within ECPG
Recording frequency	Annually
Background data	China Electric Power Yearbook 2006--2008

In this monitoring period, the installed capacity of all types power units within ECPG as below:

Installed capacity in 2007	Unit	Shanghai	Jiangsu	Zhejiang	Anhui	Fujian	Total
Fossil-fired power	MW	14,150	53,340	39,490	17,760	13,910	138,650
Hydro power	MW	0	140	8,520	1,510	9,800	19,970
Nuclear power	MW	0	2,000	3,070	0	0	5,070
Wind power and others	MW	268.8	517.8	40	0	269	1,095.60
Sum up	MW	14,418.80	55,997.80	51,120	19,270	23,979	164,785.60
Data source: <i>China Electric Power Yearbook 2008</i>							

Installed capacity in 2006	Unit	Shanghai	Jiangsu	Zhejiang	Anhui	Fujian	Total
Fossil-fired power	MW	14,526	51,776	35,391	14,134	13,001	128,828
Hydro power	MW	0	136	8,369	1,001	8,957	18,463
Nuclear power	MW	0	0	3,066	0	0	3,066
Wind power and others	MW	253	162	43	0	89	547
Sum up	MW	14,779	52,074	46,869	15,135	22,047	150,904
Data source: <i>China Electric Power Yearbook 2007</i>							

Installed capacity in 2005	Unit	Shanghai	Jiangsu	Zhejiang	Anhui	Fujian	Total
Fossil-fired power	MW	13,113.50	42,506.40	27,688.10	11,423.20	9,345.40	104,076.60
Hydro power	MW	0	142.6	6,952.10	749.8	8,224.90	16,069.40
Nuclear power	MW	0	0	3,066	0	0	3,066
Wind power and others	MW	253.3	58.8	37.2	0	52	401.3
Sum up	MW	13,366.80	42,707.80	37,743.40	12,173	17,622.30	123,613.30
Data source: <i>China Electric Power Yearbook 2006</i>							

Type of Power generation	Installed capacity in 2005	Installed capacity in 2006	Installed capacity in 2007	Addition installed capacity from 2005 to 2007	Percentage for power generation
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Fossil-fired power	104,076.60	128,828.00	138,650.00	34,573.40	83.97%
Hydro power	16,069.40	18,463.00	19,970.00	3,900.60	9.47%
Nuclear power	3,066.00	3,066.00	5,070.00	2,004.00	4.87%
Wind power and others	401.30	547.00	1,095.60	694.30	1.69%
Sum up	123,613.30	150,904.00	164,785.60	41,172.30	100%

Appendix 08

The yearly emission reductions within pre-CDM monitoring period

The pre-CDM monitoring period of the project covers 2005, 2006, 2007, 2008 and 2009, and based on the yearly subtotal data stated in appendix01, appendix 02 and appendix03, the yearly emission reductions from 2005 to 2009 can be calculated as follows:

2005		Emission reductions by project activity (tCO ₂ e)			
Start date	End date	BE	PE	Leakage	ER
08/06/2005	31/12/2005	227,253	139,382	0	87,870

2006		Emission reductions by project activity (tCO ₂ e)			
Start date	End date	BE	PE	Leakage	ER
01/01/2006	31/01/2006	1,428,746	785,779	0	642,967

2007		Emission reductions by project activity (tCO ₂ e)			
Start date	End date	BE	PE	Leakage	ER
01/01/2007	31/12/2007	1,672,608	913,252	0	759,357

2008		Emission reductions by project activity (tCO ₂ e)			
Start date	End date	BE	PE	Leakage	ER
01/01/2008	31/12/2008	1,481,499	814,338	0	667,161

2009		Emission reductions by project activity (tCO ₂ e)			
Start date	End date	BE	PE	Leakage	ER
01/01/2009	10/09/2009	1,232,361	681,844	0	550,517