MONITORING REPORT FORM (CDM-MR)
Version 01 - in effect as of: 28/09/2010

CONTENTS

MONITORING REPORT
Version 01 07/02/2012
Jincheng Sihe Coal Mine CMM Generation Project
Reference No. 1896
Monitoring Period #5 (01/01/2011 – 30/06/2011[1])

SECTION A. General description of the project activity

A.1. Brief description of the project activity: >>

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Jincheng Sihe Coal Mine CMM Generation Project (hereafter the project) is utilizing the coal mine methane (CMM), that otherwise would be released to the atmosphere, to generate electricity and displace the electricity generated by North China power grid.

The project comprises of internal combined cycle combustion engines using the CMM as a fuel, as well as waste heat boilers and steam turbines for power generation. The gas extracted is pumped to the gas tank at the power plant and mixed, stirred, and dehydrated. The gas is delivered to the compressing station for compression and then injected to the gas engines for power generation. The waste heat from the gas engines is directed into the waste heat boiler to heat the steam which is driving the steam turbine to generate electricity. There are 4 power houses in the power plant. Each power house consists of 15 gas engines (of 1.8 MW each), 3 waste heat boilers (6 t/h), and 1 steam turbine (3 MW each). Thus, the total installed capacity of the power plant is 120 MW.

The project has been registered by the CDM Executive Board since 22/04/09. The crediting period started on 22/04/09 and is a fixed period of 10 years. The project started construction on 25/01/07. After the completion of construction, the project started commissioning and received the inspection approval on 16/02/09. The expected operational lifetime of the project activity is 25 years.

The start date of the fifth monitoring period described in this monitoring report is 01/01/2011 and the end date is 30/06/2011. In this 6-month monitoring period, the achieved emission reductions of the project are 1,591,750 tCO_2e.

A.2. Project Participants

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Name of Party involved	Project participants	The Party involved wishes to be considered as project participant (Yes/No)
China (Host)	Shanxi Jincheng Anthracite Mining Group Co., Ltd.	No
Netherlands	International Bank for Reconstruction and Development as the Trustee of the Prototype Carbon Fund (PCF) and the Trustee of the IBRD-Netherlands Clean Development Mechanism Facility (NCDMF); Netherlands' Ministry of Infrastructure and the Environment (IenM) ; Electrabel S.A; Netherlands' Ministry of Economic Affairs, Agriculture and Innovation (EL&I)	Yes
Japan	Japan Carbon Finance, Ltd.; Kyushu Electric Power Co., Inc. ; Japan International Cooperation Agency (JICA) ; The Chugoku Electric Power Co., Inc. ; Chubu Electric Power Co., Inc. ; Mitsubishi Corporation ; MIT Carbon Fund Co., Ltd. ; Shikoku	No

[1] Both the starting and end dates are included in monitoring period #5.

	Electric Power Company, Incorporated ; Tohoku Electric Power Co., Inc. ; The Tokyo Electric Power Co., Inc; Mitsui & Co., Ltd.	
UK	BP Alternative Energy International Ltd. ; Deutsche Bank AG ; ICECAP Carbon Trading Ltd.	No
Sweden	Government of Sweden - Swedish Energy Agency	Yes
Norway	Norsk Hydro ASA ; Government of Norway - Ministry of Foreign Affairs ; Statoil ASA	Yes
Finland	Fortum Corporation ; Government of Finland - Ministry of Foreign Affairs	Yes
France	GDF SUEZ	No
Canada	Government of Canada - Ministry of Foreign Affairs and International Trade	Yes
Germany	RWE Power AG	No

A.3. Location of the project activity:

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This project is located within Sihe Coal Mine, located in Jiafeng Town, Qinshui County, Jincheng City, Shanxi Province of the People's Republic of China.

GPS coordinates of the project activity are as follows:

- Longitude: +112.5194 (112° 31'10" E);
- Latitude: +35.5875 (35° 35'15" N)

A.4. Technical description of the project

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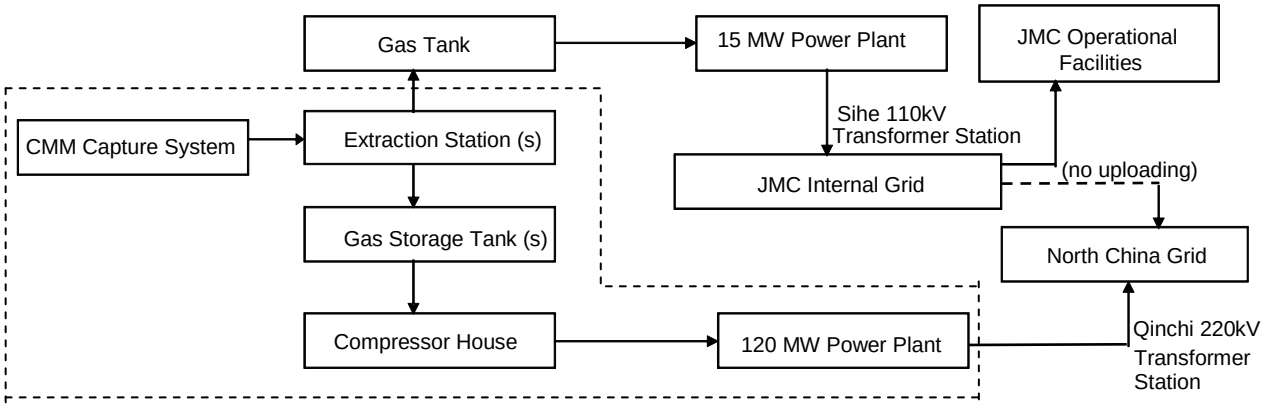
Combined cycle power generation technology is employed in the project which is composed of internal combustion engines using the CMM as fuel, waste heat boilers and steam turbines. There are four power houses in the power plant. Each power house consists of 15 gas engines (of 1.8 MW each), 3 waste heat boilers (6 t/h), and 1 steam turbine (3 MW).[2] The flow diagram of the project activity is shown in Figure 1. (JMC is the acronym of Shanxi Jincheng Anthracite Mining Group Co., Ltd.)

Figure 1: Flow diagram of the power generation by the project.

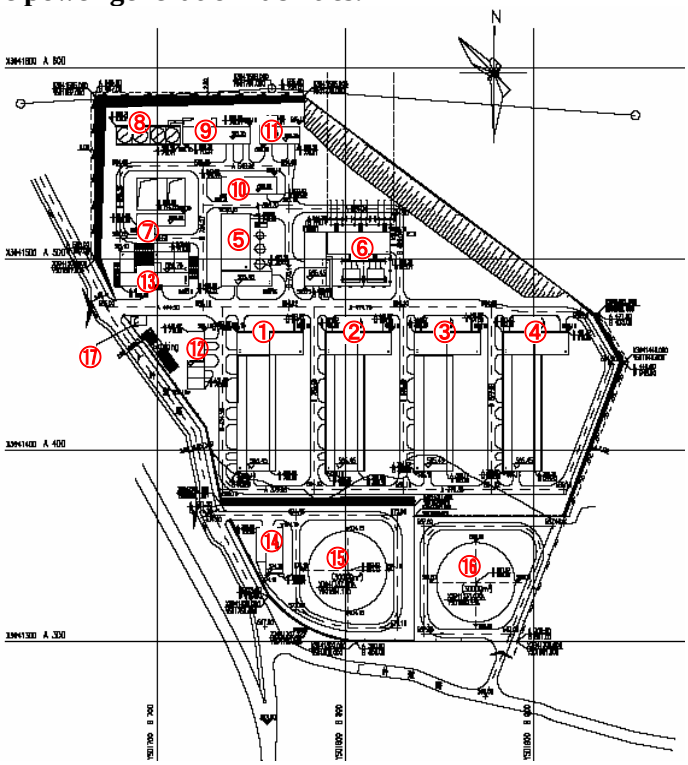


[2] For detailed information of equipments, please refer to PDD page 5-7.

The CMM is captured by the capture system[3]. The captured CMM is then pumped through the extraction stations to the gas storage tanks where it is mixed, stirred, and dehydrated. After that the gas is delivered to the compressing station for compression and then injected to the gas engines for power generation. The waste heat from the gas engines is led into the waste heat boiler to heat the steam which will drive the steam turbine to generate electricity.

The Figure 2 below illustrates the surface layout of the power generation part of this project activity.

Figure 2. Layout of the power generation facilities.



1	No.1 power house	10	Maintenance room
2	No.2 power house	11	Material storage
3	No.3 power house	12	Heat supply station
4	No.4 power house	13	Administration building
5	Chemical water treating	14	CMM compressing station
6	220KV substation	15	No.1 gas storage tank
7	Comprehensive pump house	16	No.2 gas storage tank
8	Mechanical draft cooling tower	17	Gate office
9	Circulation water pump room		

A.5. Title, reference and version of the baseline and monitoring methodology applied to the project activity:

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The approved consolidated methodology ACM0008 (Version 03): "*Consolidated methodology for coal bed methane and coal mine methane capture and use for power (electrical or motive) and heat and/or destruction by flaring"* is applied to the Project.

In accordance with the ACM0008 (Version 03), approved consolidated methodology ACM0002 (Version 06*) "Consolidated methodology for grid-connected electricity generation from renewable sources"* is adopted to calculate the emission factor of the North China Grid.

[3] Capture system in general refers to the drilling system as well as the gas collection pipeline.

A.6. Registration date of the project activity:

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The project has been registered by the CDM Executive Board since 22/04/09.

A.7. Crediting period of the project activity and related information (start date and choice of crediting period):

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The crediting period started on 22/04/09 and a 10-year fixed crediting period is adopted.

A.8. Name of responsible person(s)/entity(ies):

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Ms. Sun Biao
Project Manager
CDM Project Management Office
Shanxi Jincheng Anthracite Mining Group Co., Ltd (JMC)
Beishidian, Jincheng City, Shanxi, China, Postal Code 048006
Telephone: 86-356-3669562
Email: jmjtcdm@163.com

SECTION B. Implementation of the project activity

B.1. Implementation status of the project activity

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The project was fully commissioned on February 16, 2009. All the four power houses were put into operation at the same time. The 120MW power plant has been operated normally and consistently with the project design. The power plant was operated by the Qinshui Jinmei Methane Power Generation Co., Ltd., a full investment subsidiary company of JMC. The previous name of the company was Sihe Coal Mine Methane Power Plant and the name changed to Qinshui Jinmei Methane Power Generation Co., Ltd. in January 2010. Despite the change in name, the company remains owned by Shanxi Jincheng Anthracite Mining Group Co., Ltd (JMC).

The Monitoring Plan and the "CDM Project Management and Operations Manual" for this project has been developed based on which the monitoring activities are carried out. The on-site assessment of the initial verification was conducted on August 5-7, 2009 and received positive outcome. The on-site assessment of the first periodic verification was conducted on January 9-10, 2010. The on-site assessment of the second periodic verification was conducted on August 11-13, 2010. The on-site assessment of the third and fourth periodic verification was conducted jointly on October 19-21, 2011.

During this monitoring period (01/01/2011 to 30/06/2011), the 120MW power plant operated well and all the equipments and monitoring instruments had no malfunctions. The power plant had 6 scheduled outages due to the annual spring inspection. The annual spring inspection is mainly to inspect and test the operating equipments in order to remove any potential defects and prepare the equipments for the peak season in the summer. The inspection normally covers routine check, cleaning, fastening, preventive experiment for the equipments, protective equipment inspection, monitoring, control and communication test, etc. The details of the scheduled outages in this monitoring period are shown in the table below. From the table, every power house was shut down once for equipment checking and maintenance in January, respectively. No. 1 power house was shut down for a second time in January for upgrading the remote cooling fan switch cabinets. No. 2 and No.3 power house also upgraded their remote cooling fan switch cabinets during the shutdown, respectively. The whole power plant was shut

down at 5:40 April 6, 2011 for power plant staff to check main transformers, 220 kV high-voltage switching and lines, etc. No. 1-3 power house resumed electricity production at 22:50 April 9, 2011 while No. 4 power house resumed later at 8:00 April 10, 2011.

During the scheduled outages, the corresponding volume of gas consumption and power generation for each power house decreased accordingly.

The details of scheduled outages

Shutdown Schedule	Power house	Comments
8:10 January 1, 2011-15:10 January 2, 2011	No.1 power house	Spring inspection
16:00 January 2, 2011-14:00 January 4, 2011	No.4 power house	Spring inspection
9:00 January 18, 2011-13:30 January 19, 2011	No.2 power house	Spring inspection and upgrade of the remote cooling fan switch cabinets
8:30 January 20, 2011-14:00 January 21, 2011	No.3 power house	Spring inspection and upgrade of the remote cooling fan switch cabinets
7:00 January 22, 2011-10:00 January 23, 2011	No.1 power house	Upgrade of the remote cooling fan switch cabinets
5:40 April 6, 2011-22:50 April 9, 2011	No.1-No.3 power house	Checking transmission facility
5:40 April 6,2011-8:00 April 10, 2011	No.4 power house	Checking transmission facility

No special event which may impact the applicability of the methodology occurred during the monitoring period.

B.2. Revision of the monitoring plan

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The monitoring plan has been revised once. The revised monitoring plan was approved on 15/03/2011 and the present monitoring report has been prepared as per the approved monitoring plan.
Please refer to the web-link below for further details on the approved revision to the monitoring plan.
http://cdm.unfccc.int/Projects/DB/DNV-CUK1214826895.32/view

B.3. Request for deviation applied to this monitoring period

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Not applicable.

B.4. Notification or request of approval of changes

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Not applicable.

SECTION C. Description of the monitoring system

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The Figure 3 below represents the diagram of flows and monitoring points of the new 120MW power plant and the existing 15MW experimental power plant. The Table 1 delineates all the monitoring meters, the corresponding parameters measured and the installed location in accordance with the requirements of the latest approved monitoring plan as of 15/03/2011. The Table 1 separately indicates the meters providing data used for calculation of emission reductions and other meters providing data not used for emission reduction calculation (e.g. used for cross-checking purposes).

Figure 3: Flow diagram and monitoring points at Sihe mining site

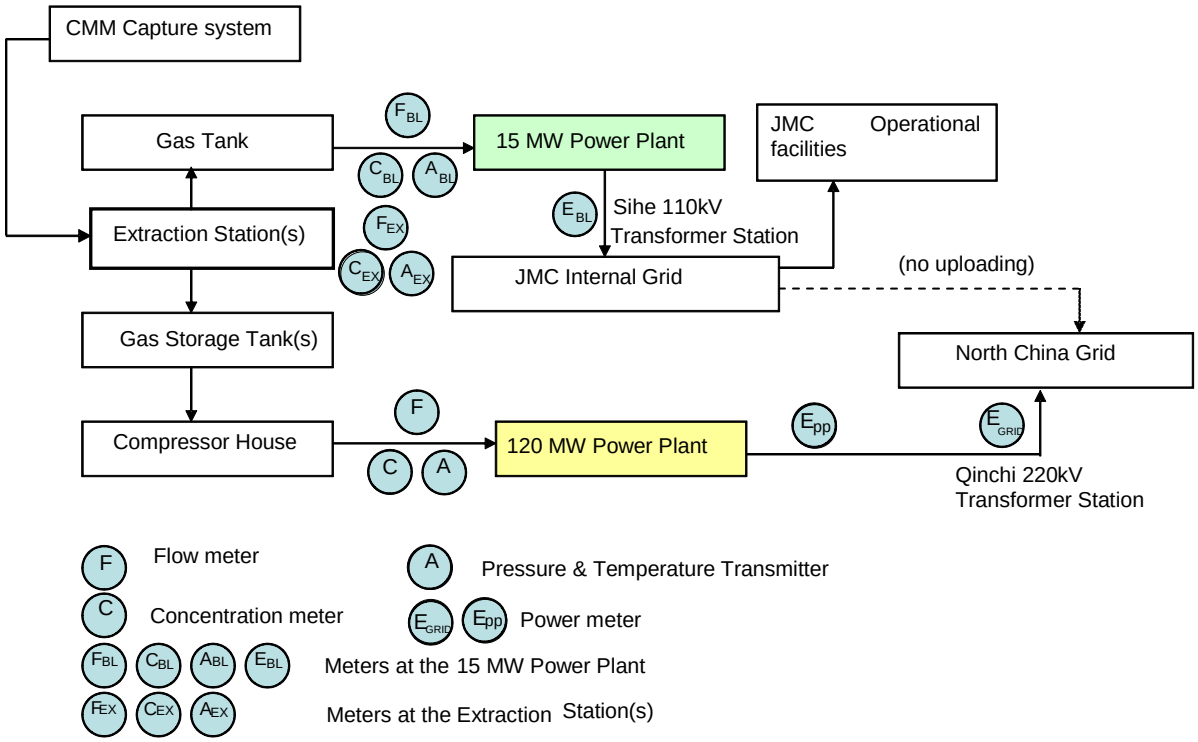


Table 1: Monitoring meters and parameters.

Symbol	Description	Monitored parameter	Installed location
Main meters used for calculation of emission reductions			
F	Gas Flow Meters	MM_{ELEC}	120MW power plant
A	Pressure & Temperature Transmitters	MM_{ELEC}	120MW power plant
C	Concentration Meters	MM_{ELEC} & $PC_{CH4,y}$	120MW power plant
E_{GRID}	Power Meters (main and backup meter)	$GEN_{1,y}$ $GEN_{2,y}$	Grid Company Qinchi 220kv transformer station
Monitoring meters not used for calculation of emission reductions			
E_{PP}	Power Meters (main and backup meter) (used for cross-checking)	$GEN_{1,y}$ $GEN_{2,y}$	120MW power plant
F_{EX}, C_{EX}, A_{EX}	Gas Flow Meters, Concentration Meters, Pressure & Temperature Transmitters	$MM_{total,y}$ $MM_{release,y}$	Extraction Station (s)
F_{BL}, C_{BL}, A_{BL}	Gas Flow Meters, Concentration Meters, Pressure & Temperature Transmitters	$MM_{BL,y}$	15MW Power Plant
E_{BL}	Power Meters	$GEN_{BL,y}$	15MW Power Plant

Monitoring equipments have been installed on all monitoring sites, including:

- No.1 and No.2 CMM Extraction Stations
- Compressor House of 120MW CMM Power Plant
- Central Controlling Room of 120MW CMM Power Plant
- 15MW CMM Power Plant

All instruments installed are in compliance with relevant national/sectoral standards and are calibrated and maintained in accordance with the manufacturers' instructions and relevant national/sectoral standards by the accredited third party and by the trained monitoring staff at each site, supervised by the site manager. The electricity meters are calibrated by authorized entities and inspected by the local grid company. All relevant records have been archived and will be kept for the longer of two years longer than the crediting period or two years after the last issuance of CERs.

The Table 2 indicates the main metering equipments that are used for calculation of emission reductions from the project (e.g., the meters installed at the 120MW power plant only). The number of installed meters is not including backup meters. More detailed information on the metering equipment listed in the Table 1 is provided in the Section D.

Table 2: Meters Installed at the Jincheng Sihe 120MW CMM Power Plant.

Type of metering equipment	Range	Accuracy level	Calibration frequency	No. of installed meters
Gas Flow Meter (differential pressure transmitter)	0～6.0KPa	0.20%	Annual	4
Pressure Transmitter	0～100KPa	0.20%	Annual	4
Temperature Transmitter	-200-500℃	±(0.30+0.005|t|)	Annual	4
Concentration Meter (methane concentration analyzer)	0-100%	±2.0%	Annual	4
Power Meter	0-99999.999	0.2S	Annual	2

Data collection

Each monitoring spot is equipped with the monitoring system including all kinds of instruments (as listed in the tables above) and computer system, and also the 120MW power plant is equipped with DCS (distributed control system). The data of the monitoring instruments are generated, collected and archived automatically by DCS. A spreadsheet with the data of each hour is generated automatically and can be printed out daily. The operators on duty will record the data manually per hour for cross-checking.

Data collection procedures for MM_{ELEC}, $MM_{total,y}$, $MM_{release,y}$, $MM_{BL,y}$ and $PC_{CH4,y}$

The data collection procedures for MM_{ELEC}, $MM_{total,y}$, $MM_{release,y}$ and $MM_{BL,y}$ are almost identical. The monitoring of $PC_{CH4,y}$ is integrated in the monitoring of $MM_{ELEC.}$

Gas mixture flow, methane concentration, gas pressure and gas temperature are continuously measured at each CMM monitoring spot using electronic equipment and archived in computer. Mass of methane is then calculated from those measurements. A spreadsheet is generated automatically to record the amount of methane, methane concentration, gas pressure and temperature values per hour. Also, these values are recorded manually per hour. The daily aggregation of methane can be obtained by the spreadsheet record or the manual record. These records are checked by the shift leader or the site manager and then copied for the CDM Office of JMC periodically. The Monitoring Team of the CDM Office check the records, sum up the amount of methane ($MM_{ELEC,}$ $MM_{total,y}$ $MM_{release,y,}$ $MM_{BL,y}$) respectively. $PC_{CH4,y}$, the concentration of methane in extracted gas is measured, read and recorded continuously. The concentration data recorded at 11AM of the first day of each month has been presented on section D.2 for illustration purpose only. MM_{ELEC} is used in the emission reductions calculation. $MM_{total,y,}$ $MM_{release,y}$ and $MM_{BL,y}$ are not used in the emission reductions calculation.

Data collection procedures for $GEN_{1,y}$ $GEN_{2,y}$ and $GEN_{BL,y}$

$GEN_{1,y}$ and $GEN_{2,y}$ are continuously measured both in 120MW Power Plant and Grid Company by bidirectional electricity meters. The Power Plant's personnel on duty record the readings hourly and sum up the daily electricity amount. The record is then checked by the shift leader or site manager and copied for the CDM Office periodically. The settlement notices are issued by the Grid Company monthly. The Monitoring Team of the CDM Office check and sum up the electricity amount data from the Power Plant monthly to crosscheck the electricity amount from the settlement notices. The differences between them are mostly small line loss. The electricity amount from the settlement notices is more conservative and therefore used in the emission reductions calculation.

$GEN_{BL,y}$ is continuously measured in 15MW power station by electricity meter. The 15MW Power Station's personnel on duty record the electricity amount hourly and sum up the daily electricity amount. The record is then checked by the shift leader or site manager and copied for the CDM Office periodically. The Monitoring Team of the CDM Office checks and sum up the electricity data monthly. $GEN_{BL,y}$ is not used in the emission reductions calculation.

Data collection procedures for $PC_{NMHC,y}$ and CEF_{NMHC}

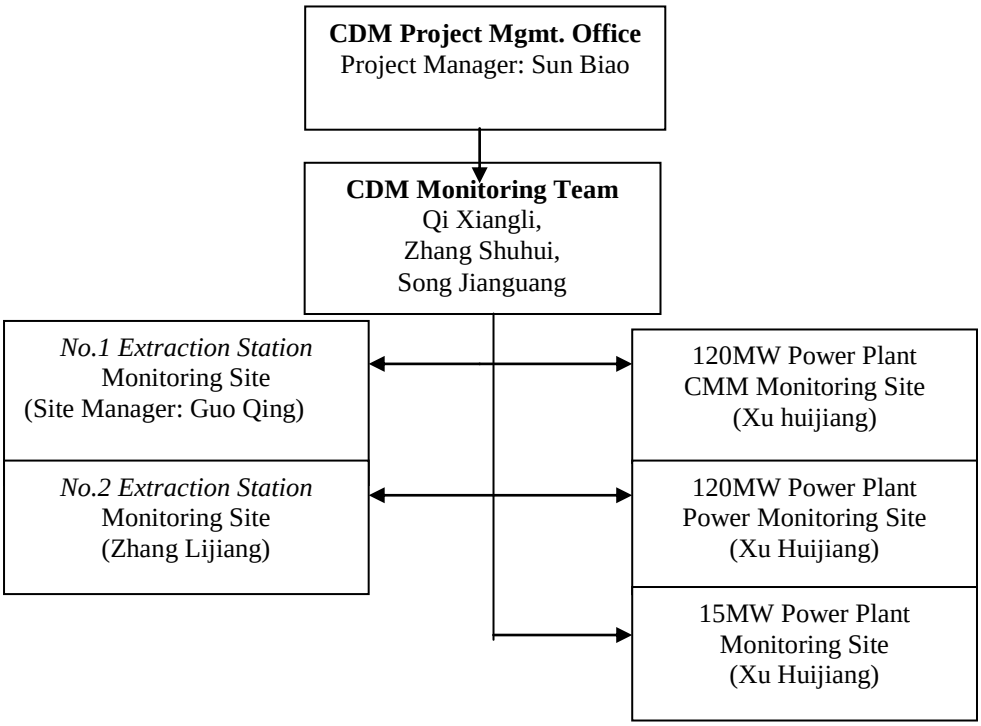
Samples of coal mine gas are taken annually, and analysed at a qualified laboratory. The testing result of NMHC is kept both in the 120MW power plant and the CDM Office. **$PC_{NMHC,y}$** will not be used in the Emission reductions calculation if the NMHC concentration is less than 1%. **CEF_{NMHC}** will be monitored only if $PC_{NMHC,y}$ >1% (PDD, page 35).

All the data are properly kept by the site managers and the CDM Office and will be kept for at least 2 years after the end of the crediting period.

Organizational structure, roles and responsibilities

The JMC has established a CDM Project Management Office and appointed Ms. Sun Biao as the project manager, who oversees the Office and is responsible for the overall CDM monitoring activities at JMC, supervising the implementation of the Monitoring Plan, checking and reviewing related data, reviewing and issuing the monitoring report. The organization structure of the monitoring is presented in Figure 4 with indication of the names of the personnel responsible for monitoring activities.

Figure 4: Organizational Structure of Monitoring.



Under the CDM Project Management Office, a Monitoring Team, consisting of Qi Xiangli, Zhang Shuhui and Song Jianguang has been established. The Monitoring team is responsible for coordinating the monitoring issues of each monitoring site, supervising the regular checking and maintenance of the related meters, data recording, data handling and report preparations. The monitoring staffs have all received specific technical training before assuming their responsibilities.

At each monitoring site, a monitoring group has been established, including a site manager and several monitoring staffs (see Figure 4):

- For the No.1 CMM Extraction Station, the site manager is Guo Qing;
- For No.2 CMM Extraction Station, the site manager is Zhang Lijiang; and
- For the 120MW CMM Power Plant and the experimental 15MW CMM Power Plant, the site manager isXu Huijiang.

The monitoring group is responsible for operations, maintenance and calibration of the monitoring meters and timely and accurately recording the data in accordance with the "CDM Project Management and Operating Manual" for this project. Each site manager is responsible for regular checks of the data recorded in order to verify if the values are accurate and complete.

The CDM Project Management Office also checks and verifies the data values when reviewing and consolidating the data collected from each site. In case there is a potential data issue, the site manager should inform the CDM Project Manager and attempt to solve the problem. If the issue relates to the equipment, the site manager should immediately contact the supplier and inform the CDM Project Manager. The site manager and monitoring staffs have all received necessary training.

Training

The training and professional education provided to the staffs includes:

1) The monitoring equipment suppliers provide training to the site managers and staff on how to operate the equipment and read meters so that the staff can undertake the tasks of data recording and equipment maintenance required by the monitoring plan;

2) The CDM experts provide specific CDM training to all personnel involved in the monitoring tasks;

3) Internal trainings are conducted periodically on how to comply with the rules and requirements in the "CDM Project Management and Operating Manual" for this project.

Emergency procedures for the monitoring system

In case of the malfunction of on-site digital systems or significant difference between automatic and manual records, site manager should analyze the discrepancy with the assistance of technical staffs based on historic records, technical standard of the equipment and the operational parameters. The site manager should contact the CDM Project Manager and make record of any malfunction or significant discrepancy.

In case of instrument malfunction, and after verification by the CDM Project Manager, the emissions reductions generated during the period of malfunction would not be counted in order to ensure integrity and quality of the emission reductions.

The monitoring team is responsible for the timely replacement of the failed equipment. All the measures taken to address the problem and correct the error should be reported to the CDM Project Manager. The CDM Project Manager needs to validate and sign on the report. The report should be archived according to the "CDM Project Management and Operating Manual".

In addition, backup meters are prepared, calibrated and ready for use in case of malfunction. Manual records are undertaken for crosschecking and backup.

SECTION D. Data and parameters

D.1. Data and parameters determined at registration and not monitored during the monitoring period, including default values and factors

Data / Parameter:	$F_{i,j,y}$
Data unit:	Mt, Mm^3
Description:	the amount of fuel *i* (in a mass or volume unit) consumed by relevant power sources j in year(s) *y*
Source of data used:	China Energy Statistical Yearbook (2000~2005)
Value(s) :	See Annex 3 of PDD for details
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Official statistical data
Additional comment:	

Data / Parameter:	NCV_i
Data unit:	*TJ/ mass or volume unit of a fuel*
Description:	the net calorific value (energy content) per mass or volume unit of a fuel *i*
Source of data used:	China Energy Statistical Yearbook (2005)
Value(s) :	See Annex 3 of PDD for details
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	National and official data
Additional comment:	

Data / Parameter:	$OXID_i$
Data unit:	%
Description:	the oxidation factor of the fuel *i*
Source of data used:	*Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*
Value(s) :	see Annex 3 of PDD for details
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	National data not available, so IPCC default values are used.
Additional comment:	

Data / Parameter:	$EF_{CO2,i}$
Data unit:	tCO_2e/TJ
Description:	the CO_2 emission factor per unit of energy of the fuel *i*
Source of data used:	*Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*
Value(s) :	see Annex 3 of PDD for details
Indicate what the data are used for (Baseline/ Project/	National data not available, so IPCC default values are used.

Leakage emission calculations)	
Additional comment:	

Data / Parameter:	$G_{j,y}$
Data unit:	MWh
Description:	the amount of electricity generation by source *j* in year *y*
Source of data used:	China Electric Power Yearbook (2000~2005)
Value(s) :	See Annex 3 of PDD for details
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Official statistical data
Additional comment:	

Data / Parameter:	$e_{j,y}$
Data unit:	%
Description:	station service power consumption rate of source *j* in year *y*
Source of data used:	See Annex 3 for details
Value(s) :	Official statistical data
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	China Energy Statistical Yearbook (2000~2005)
Additional comment:	

Data / Parameter:	$EE_{coal,adv}$
Data unit:	%
Description:	Efficiency of most advanced coal-fired power technology that is commercially available
Source of data used:	Notice on the determination of emission factors of regional power grids by Chinese CDM DNA
Value(s) :	36.53
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Official statistics of state power authority
Additional comment:	

Data / Parameter:	$EE_{oil,adv}$
Data unit:	%
Description:	Efficiency of most advanced oil-fired power technology that is commercially available
Source of data used:	Notice on the determination of emission factors of regional power grids by Chinese CDM DNA
Value(s) :	45.87
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Official statistics of state power authority
Additional comment:	

Data / Parameter:	$EE_{gas,adv}$

Data unit:	%
Description:	Efficiency of most advanced gas-fired power technology that is commercially available
Source of data used:	Notice on the determination of emission factors of regional power grids by Chinese CDM DNA
Value(s) :	45.87
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Official statistics of state power authority
Additional comment:	

Data / Parameter:	$CAP_{j,y}$
Data unit:	MW
Description:	Installed capacity of source *j* in year *y* in Northwest Power Grid
Source of data used:	China Energy Statistical Yearbook (2000~2005)
Value(s) :	See Annex 3 of PDD for details
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Official statistical data
Additional comment:	

Data / Parameter:	EF_{ELEC}
Data unit:	tCO_2e/MWh
Description:	Emissions factor of North China Grid
Source of data used:	Calculated according to ACM0002 (Version 6). The calculation details are provided in Annex 3 of the PDD.
Value(s) :	0.98255
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	The data are used to calculate the baseline emissions from power generation replaced by the project.
Additional comment:	

Data / Parameter:	CEF_{ELEC}
Data unit:	tCO_2e/MWh
Description:	Carbon emission factor of electricity used by coal mine (= EF_{ELEC})
Source of data used:	See EF_{ELEC}
Value(s) :	0.98255
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	The data are used to calculate the project emissions due to the power consumption by the project.
Additional comment:	Not applicable since the net electricity delivered to the grid is used for the calculation of emission reductions.

Data / Parameter:	GWP_{CH4}
Data unit:	tCO_2e / tCH_4
Description:	Global Warming Potential (GWP) of methane, valid for the relevant commitment period
Source of data used:	Decisions under UNFCCC and the Kyoto Protocol (a value of 21 is to be applied for the first commitment period of the Kyoto Protocol)
Value(s) :	21

Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	The data are used for the calculation of the project emissions from un-combusted methane.
Additional comment:	Please also refer to the section B.6.1 of the registered PDD.

Data / Parameter:	Eff_{ELEC}
Data unit:	%
Description:	Efficiency of methane destruction/oxidation in power plant
Source of data used:	IPCC default value
Value(s) :	99.5
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	The data are used for calculation of project emissions from methane destroyed through power generation.
Additional comment:	Please also refer to the section B.6.1 of the registered PDD.

Data / Parameter:	CEF_{CH4}
Data unit:	tCO_2e/tCH_4
Description:	Carbon emission factor for combusted methane
Source of data used:	According to the applied methodology
Value(s) :	2.75
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	The data are used for calculation of project emissions from methane destroyed through power generation.
Additional comment:	Please also refer to the section B.6.1 of the registered PDD.

Data / Parameter:	ρ
Data unit:	t/m^3
Description:	Density of CH_4 under normal conditions
Source of data used:	IPCC default value
Value(s) :	0.00067
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	The data are used for calculation of project emissions from methane delivered to the power plant.
Additional comment:	Please also refer to the section B.6.1 of the registered PDD.

Data / Parameter:	$\mathbf{MM_{BL}}$
Data unit:	tCH_4
Description:	Amount of methane consumed by the 15MW power plant
Source of data used:	Measured in m^3 and recorded in the log sheets and converted into tCH_4 using IPCC value of $0.00067t/m^3$
Value(s) :	24,139.73
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Maximum annual value of the four years period prior to project implementation (year 2005-2008) is taken.
Additional comment:	

Data / Parameter:	$\mathbf{GEN_{BL}}$
Data unit:	MWh
Description:	Electricity generated by the 15MW power plant

Source of data used:	Measured
Value(s) :	86,089.234
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Maximum annual value of the four years period prior to project implementation (year 2005-2008) is taken.
Additional comment:	

D.2. Data and parameters monitored

Data / Parameter:	MM_{ELEC}
Data unit:	tCH_4
Description:	Methane measured delivered to the 120MW power plant during the monitoring period
Measured /Calculated /Default:	Measured
Source of data:	Measurements by project participants using gas flow meters, temperature & pressure transmitters and gas concentration meters.
Value(s) of monitored parameter:	67,560.62
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project emissions: - from methane destroyed MD_{ELEC} (Formula 3 & 5 in the PDD); - from un-combusted methane P_{UM} (Formula 6 in the PDD); Baseline emissions: - for release of methane into atmosphere that is voided by the project BE_{MR} (Formula 10 in the PDD)

Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)

<u>Gas flow meters (differential pressure transmitter)</u>
Accuracy class: 0.20%

Serial numbers		Service time in this monitoring period	Date of last calibration	Validity of calibration
No.1 power house	01A0716338	Jan.1, 2011	04/02/2010	03/02/2011
	09052891	Jan.1-June 30, 2011	15/11/2010	14/11/2011
No.2 power house	01A0716339	Jan. 1-Jan. 18, 2011	04/02/2010	03/02/2011
	09052892	Jan. 18-June 30, 2011	15/11/2010	14/11/2011
No.3 power house	01A0716337	Jan.1-April 9, 2011	06/05/2010	05/05/2011
	01A0716338	April 9-June 30, 2011	08/04/2011	07/04/2012
No.4 power house	01A0716336	Jan. 1-April 9, 2011	06/05/2010	05/05/2011
	01A0716339	April 9-June 30, 2011	08/04/2011	07/04/2012

Calibration frequency: annual
Model: 1151DP3E22M1B1ED
Location: refer to meter F in Figure 3
Note: The interim replacement of gas flow meters for all 4 power houses is due to the calibration activities which require the meters to be delivered to the certified inspection institution.

<u>Pressure Transmitters</u>
Accuracy class: 0.20%

Serial numbers		Service time in this monitoring period	Date of last calibration	Validity of calibration
No.1 power house	01A0643195	Jan. 1-Jan. 1, 2011	04/02/2010	03/02/2011
	09052889	Jan. 1-June 30, 2011	15/11/2010	14/11/2011
No.2 power house	01A0643194	Jan.1-Jan. 18, 2011	04/02/2010	03/02/2011
	09052890	Jan.18-June 30, 2011	15/11/2010	14/11/2011

No.3 power house	01A0643196	Jan.1-April 9, 2011	06/05/2010	05/05/2011
	01A0643195	April 9-June 30, 2011	08/04/2011	07/04/2012
No.4 power house	01A0643193	Jan.1-April 9, 2011	06/05/2010	05/05/2011
	01A0643194	April 9-June 30, 2011	08/04/2011	07/04/2012

Calibration frequency: annual
Model: 1151GP5E22M1B1ED
Location: refer to meter A in Figure 3
Note: The interim replacement of pressure transmitters for all 4 power houses is due to the calibration activities which require the meters to be delivered to the certified inspection institution.

Temperature Transmitters
Accuracy class: ±(0.30+0.005|t|)

Serial numbers		Service time in this monitoring period	Date of last calibration	Validity of calibration
No.1 power house	090615002	Jan. 1-Jan. 1, 2011	05/02/2010	04/02/2011
	7040214	Jan.1-June 30, 2011	08/11/2010	07/11/2011
No.2 power house	0906 5004	Jan. 1-Jan. 18, 2011	05/02/2010	04/02/2011
	7040213	Jan. 18-June 30, 2011	08/11/2010	07/11/2011
No.3 power house	090615001	Jan.1-Jan. 20, 2011	05/02/2010	04/02/2011
	7040216	Jan. 20- June 30, 2011	08/11/2010	07/11/2011
No.4 power house	090615005	Jan. 1-Jan. 3, 2011	05/02/2010	04/02/2011
	7040215	Jan. 3-June 30, 2011	08/11/2010	07/11/2011

Calibration frequency: annual
Model: WZP-24SA
Location: refer to meter A in Figure 3

Concentration meters (methane concentration analyzer)
Accuracy class: ±2.0%

Serial numbers		Service time in this monitoring period	Date of last calibration	Validity of calibration
No.1 power house	29559	Jan. 1-April 6, 2011	28/05/2010	27/05/2011
	29562	April 9-June 30, 2011	08/04/2011	07/04/2012
No.2 power house	29562	Jan. 1-April 6, 2011	28/05/2010	27/05/2011
	30105	April 9-June 30, 2011	08/04/2011	07/04/2012
No.3 power house	30105	Jan. 1-April 6, 2011	28/05/2010	27/05/2011
	25940	April 9-June 30, 2011	08/04/2011	07/04/2012
No.4 power house	30106	Jan. 1-April 6, 2011	28/05/2010	27/05/2011
	29559	April 9-June 30, 2011	08/04/2011	07/04/2012

Note: All the 4 power houses were shut down from 5:40 April 6 to 22:50 April 9, 2011[4] (see details in Section B.1). The meters were sent for calibration during this period.
Calibration frequency: annual
Model: 97460
Location: refer to meter C in Figure 3

Measuring/ Reading/ Recording frequency:	Continuous/Continuous/Continuous (system) + Hourly (manual) Continuous monitoring, meters in compliance with relevant standards and requirements are used, and gas volumes, pressure, temperature and methane concentration are read and consolidated by a digital control system.
Calculation method (if	Not applicable

[4] No.4 power house was shut down from 5:40AM April 6 to 8:00AM April 10, 2011.

applicable):	
QA/QC procedures applied:	Flow meters, pressure & temperature transmitters and gas concentration meters are checked monthly and calibrated annually. Data are manually recorded hourly (on the hour ±5 minutes) for cross-checking and used as a backup in case the automatic recording system is under abnormal condition.

Data / Parameter:	$GEN_{1,y}$
Data unit:	MWh
Description:	Electricity supplied by project activity to North China Grid during the monitoring period
Measured /Calculated /Default:	Measured
Source of data:	1. Monitored with power meter installed by the electric grid company and recorded in the form of Settlement Notice issued by the electric grid company (monthly); 2. Manually recorded by JMC hourly for cross-checking and backup.
Value(s) of monitored parameter:	406,445.952 (settlement notice for ER calculation) 408,293.952 (manual record for cross-check)
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emissions from power generation replaced by the project $BE_{Use,y}$ (Formula 11 in the PDD)
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Bidirectional electricity meters (JMC, used for cross-checking and backup) Accuracy class: 0.2S

Serial numbers	Date of calibration	Validity of calibration
86384895	09/06/2010	08/06/2011
	06/06/2011	05/06/2012
86384896	09/06/2010	08/06/2011
	06/06/2011	05/06/2012

Calibration frequency: annual
Model: ZMQ202C
Location: refer to meter E_{pp} in figure 3

Bidirectional electricity meters (Grid, used for emission reduction calculations)
Accuracy class: 0.2S

Serial numbers	Date of calibration	Validity of calibration
507003703	02/06/2010	01/06/2011
	10/05/2011	09/05/2012
507003731	02/06/2010	01/06/2011
	10/05/2011	09/05/2012

Calibration frequency: annual
Model: DTSD718
Location: refer to meter E_{GRID} in figure 3

Measuring/ Reading/ Recording frequency:	Continuous/Continuous/Hourly
Calculation method (if applicable):	Not applicable
QA/QC procedures applied:	The electricity delivered to the grid are recorded in the power settlement notice issued by the grid company based on the readings of the power meters installed at the Qinchi transformer station in

	accordance with relevant national and sectoral standards (indicated as point E_{GRID} on Figure 3). The amount of electricity delivered to the grid is double-checked by the readings of the power meters installed at the project 120MW power plant (indicated as point E_{PP} on Figure 3). All the power meters are calibrated annually.

Data / Parameter:	$GEN_{2,y}$
Data unit:	MWh
Description:	Electricity consumed by the project during the monitoring period which is supplied by North China Grid in case of emergency
Measured /Calculated /Default:	Measured
Source of data:	1. Monitored with power meter installed by the electric grid company and recorded in the form of Settlement Notice issued by the electric grid company (monthly); 2. Manually recorded by JMC hourly for cross-checking and backup.
Value(s) of monitored parameter:	4.752(settlement notice for ER calculation) 4.752(manual record for cross-check)
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emissions from power generation replaced by the project $BE_{Use,y}$ (Formula 11 in the PDD)
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Bidirectional electricity meters (JMC, used for cross-checking and backup) Accuracy class: 0.2S

Serial numbers	Date of calibration	Validity of calibration
86384895	09/06/2010	08/06/2011
	06/06/2011	05/06/2012
86384896	09/06/2010	08/06/2011
	06/06/2011	05/06/2012

Calibration frequency: annual
Model: ZMQ202C
Location: refer to meter E_{pp} in figure 3

Bidirectional electricity meters (Grid, used for emission reduction calculations)
Accuracy class: 0.2S

Serial numbers	Date of calibration	Validity of calibration
507003703	02/06/2010	01/06/2011
	10/05/2011	09/05/2012
507003731	02/06/2010	01/06/2011
	10/05/2011	09/05/2012

Calibration frequency: annual
Model: DTSD718
Location: refer to meter E_{GRID} in figure 3

Measuring/ Reading/ Recording frequency:	Continuous/Continuous/Hourly
Calculation method (if applicable):	Nor applicable
QA/QC procedures applied:	The electricity imported from the grid are recorded in the power settlement notice issued by the grid company based on the readings of the power meters installed at the Qinchi transformer station in accordance with relevant national and sectoral standards (indicated as

	point E_{GRID} on Figure 3). The amount of electricity imported from the grid is double-checked by the readings of the power meters installed at the project 120 MW power plant (indicated as point E_{PP} on Figure 3). All the power meters are calibrated annually.

Data / Parameter:	$PC_{CH4,y}$
Data unit:	**%**
Description:	Concentration of methane (in mass) in extracted gas (%), measured on wet basis
Measured /Calculated /Default:	Measured
Source of data:	Daily monitoring by JMC. Meter readings transferred through digital (DCS) system and recorded automatically.
Value(s) of monitored parameter:	

Date and time	No.1 Power House	No.2 Power House	No.3 Power House	No.4 Power House
1/1/2011 11:00AM	0.00※	38.62	39.65	39.00
1/2/2011 11:00AM	40.75	40.89	39.95	40.01
1/3/2011 11:00AM	41.97	40.95	4 .54	41.96
1/4/2011 11:00AM	45.46	46.36	45.96	46.19
1/5/2011 11:00AM	43.33	42.82	42.58	43.13
1/6/2011 11:00AM	45.34	44.73	45.74	45.65

Note: The concentration of methane in extracted gas is measured, read and recorded continuously in compliance with the monitoring requirement. The data recorded at 11AM of the first day of each month has been presented above for illustration purpose only.

※The No.1 power house was shut down from 8:10 January 1 to 15:10 January 2, 2011 (see details in Section B.1). Therefore, there was no extracted gas supplied to No.1 power house during this period. Zero is thus applied for the concentration of methane.

Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Integrated with the monitoring of MM_{ELEC} (methane delivered to the power plant)
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Concentration meters (methane concentration analyzer) Accuracy class: ±2.0%

Serial numbers		Service time in this monitoring period	Date of last calibration	Validity of calibration
No.1 power house	29559	Jan. 1-April 6, 2011	28/05/2010	27/05/2011
	29562	April 9-June 30, 2011	08/04/2011	07/04/2012
No.2 power house	29562	Jan. 1-April 6, 2011	28/05/2010	27/05/2011
	30105	April 9-June 30, 2011	08/04/2011	07/04/2012
No.3 power house	30105	Jan. 1-April 6, 2011	28/05/2010	27/05/2011
	25940	April 9-June 30, 2011	08/04/2011	07/04/2012
No.4 power house	30106	Jan. 1-April 6, 2011	28/05/2010	27/05/2011
	29559	April 9-June 30, 2011	08/04/2011	07/04/2012

Calibration frequency: annual
Model: 97460
Location: refer to meter C in figure 3

Measuring/ Reading/ Recording frequency:	Continuous/Continuous/Continuous (system) + Hourly (manual)

	Concentration meters, optical and calorific, with accuracy in compliance with relevant national standards.
Calculation method (if applicable):	Not applicable
QA/QC procedures applied:	Concentration meters are checked monthly and calibrated annually to ensure accuracy.

Data / Parameter:	$PC_{NMHC,y}$
Data unit:	%
Description:	NMHC concentration in coal mine gas
Measured /Calculated /Default:	Measured
Source of data:	Testing report by Shanxi Coal Industry Bureau Comprehensive Testing Center on May 19, 2011
Value(s) of monitored parameter:	0(C_2H_6=0.00%, C_3H_8=0.00%, C_4H_{10}(N- butane)=0.00%, C_4H_{10}(Isobutane)=0.00%)
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Verifying whether $PC_{NMHC,y}$ is below 1%
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Owned and operated by Shanxi Coal Industry Bureau Comprehensive Testing Center
Measuring/ Reading/ Recording frequency:	Annual sampling The gas to be tested is sampled on site annually in accordance with relevant industry standards and procedures. The samples are analyzed by a qualified laboratory.
Calculation method (if applicable):	Not applicable
QA/QC procedures applied:	The test is implemented by Shanxi Coal Industry Bureau Comprehensive Testing Center. A minimum of 3 samples is collected in secure gas sample vessels, suitable for storage and transport to the laboratory. If one sample is found to be faulty (i.e. gas leakage), the replacement sample will be taken.

Data / Parameter:	CEF_{NMHC}
Data unit:	tCO_2e/t NMHC
Description:	Carbon emission factor for combusted non methane hydrocarbons
Measured /Calculated /Default:	Measured (only if $PC_{NMHC,y}$ >1%)
Source of data:	Testing report by Shanxi Coal Industry Bureau Comprehensive Testing Center on May 19, 2011
Value(s) of monitored parameter:	Not applicable since the $PC_{NMHC,y}$ =0
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project emissions from combustion of NMHC (Formula 3 in the PDD)
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last	Owned and operated by Shanxi Coal Industry Bureau Comprehensive Testing Center

calibration, validity)	
Measuring/ Reading/ Recording frequency:	To be measured only when NMHC concentration (in mass) in coal mine gas is higher than 1%
Calculation method (if applicable):	Not applicable
QA/QC procedures applied:	In the gas composition test report issued by Shanxi Coal Industry Bureau Comprehensive Testing Center on May 19, 2011, the concentration of non methane hydrocarbons was 0, therefore, it is not required to measure $CEF_{NMHC.}$

Data / Parameter:	$MM_{BL,y}$
Data unit:	tCH_4
Description:	Amount of methane consumed by the 15MW power plant during the monitoring period.
Measured /Calculated /Default:	Measured
Source of data:	Digital and manual recording in log sheets
Value(s) of monitored parameter:	11,462.08
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	The readings of these meters are not used for ER calculation, but for crosschecking only. $MM_{BL,y}$ value are compared against MM_{BL} to ensure no leakage ($MM_{BL,y}$>= MM_{BL}). In case $MM_{BL,y}$< MM_{BL}, the difference will be calculated in terms of the contributing emission reductions, which will be deducted from the total claimed emission reductions. $MM_{BL,y}$ is lower than MM_{BL} in terms of monthly average , therefore the leakage is deducted from the total claimed ERs (please refer to section E.3 and CER calculation sheet).
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	<u>Gas flow meters</u> Accuracy class: ±0.5%

Serial numbers		Service time in this monitoring period	Date of last calibration	Validity of calibration
Pipe DN150	9050704	Jan. 1-May 2, 2011	19/05/2010	18/05/2011
	9050705	May 2-June 30, 2011	28/04/2011	27/04/2012
Pipe DN200	9050705	Jan. 1-April 10, 2011	19/05/2010	18/05/2011
	10060801	April 10-June 30, 2011	20/02/2011	19/02/2012

Calibration frequency: annual
Model: KVS08 Ⅱ KC23FSN ,KVS08 Ⅱ KF23FSN
Location: refer to meter F_{BL} in figure 3

<u>Pressure transmitters</u>
Accuracy class: 0.1 grade

Serial numbers		Service time in this monitoring period	Date of last calibration	Validity of calibration
Pipe DN150	1794993	Jan. 1-April 15, 2011	18/05/2010	17/05/2011
	1794992	April 15-May 5, 2011	18/05/2010	17/05/2011
	1794993	May 5-June 30, 2011	26/04/2011	25/04/2012
Pipe DN200	1794992	Jan. 1-April 1, 2011	18/05/2010	17/05/2011
	5570927	April 1-June 30, 2011	15/11/2010	14/11/2011

Calibration frequency: annual
Model: 3051TG3A2B21AB4E5Q4M5; 3051TG3A2B21AB4E5M5
Location: refer to meter A_{BL} in figure 3

<u>Temperature transmitters</u>
Accuracy class: 0.5

<table>
<tr><td></td><td>
<table>
<tr><th colspan="2">Serial numbers</th><th>Service time in this monitoring period</th><th>Date of last calibration</th><th>Validity of calibration</th></tr>
<tr><td rowspan="3">Pipe DN150</td><td>4018</td><td>Jan. 1-April 1, 2011</td><td>18/05/2010</td><td>17/05/2011</td></tr>
<tr><td>b119045737</td><td>April 1-May 5, 2011</td><td>14/03/2011</td><td>13/03/2012</td></tr>
<tr><td>30757178-001</td><td>May 5-June 30, 2011</td><td>03/05/2011</td><td>02/05/2012</td></tr>
<tr><td rowspan="2">Pipe DN200</td><td>4005</td><td>Jan.1-May 5, 2011</td><td>18/05/2010</td><td>17/05/2011</td></tr>
<tr><td>b119045737</td><td>May 5-June 30, 2011</td><td>14/03/2011</td><td>13/03/2012</td></tr>
</table>
Calibration frequency: annual
Model: FIX64972 ;STT25M
Location: refer to meter A_{BL} in figure 3

<u>Heat resistance</u>
Accuracy class: B
<table>
<tr><th colspan="2">Serial numbers</th><th>Service time in this monitoring period</th><th>Date of last calibration</th><th>Validity of calibration</th></tr>
<tr><td rowspan="3">Pipe DN150</td><td>2009062417</td><td>Jan. 1-April 1, 2011</td><td>18/05/2010</td><td>17/05/2011</td></tr>
<tr><td>0811383</td><td>April 1-May 5, 2011</td><td>14/03/2011</td><td>13/03/2012</td></tr>
<tr><td>2009062417</td><td>May 5-June 30, 2011</td><td>03/05/2011</td><td>02/05/2012</td></tr>
<tr><td rowspan="2">Pipe DN200</td><td>2009062416</td><td>Jan. 1-May 5, 2011</td><td>18/05/2010</td><td>17/05/2011</td></tr>
<tr><td>0811383</td><td>May 5-June 30, 2011</td><td>14/03/2011</td><td>13/03/2012</td></tr>
</table>
Calibration frequency: annual
Model: N-WZPK-210/Pt100
Location: refer to meter A_{BL} in figure 3

<u>Methane concentration analyzer</u>
Accuracy class: ±2.0%
<table>
<tr><th colspan="2">Serial numbers</th><th>Service time in this monitoring period</th><th>Date of last calibration</th><th>Validity of calibration</th></tr>
<tr><td rowspan="2">Pipe DN150</td><td>29554</td><td>Jan. 1-Feb. 10, 2011</td><td>19/05/2010</td><td>18/05/2011</td></tr>
<tr><td>29561</td><td>Feb. 12-June 30, 2011</td><td>11/02/2011</td><td>10/02/2012</td></tr>
<tr><td rowspan="2">Pipe DN200</td><td>29561</td><td>Jan. 1-Feb. 10, 2011</td><td>19/05/2010</td><td>18/05/2011</td></tr>
<tr><td>29554</td><td>Feb. 12-June 30, 2011</td><td>11/02/2011</td><td>10/02/2012</td></tr>
</table>
Note: The 15MW power plant was shut down for spring inspection from 8:00 Feb. 10, to 18:50 Feb. 12, 2011. The meters were sent for calibration during this period.
Calibration frequency: annual
Model: 97460
Location: refer to meter C_{BL} in figure 3</td></tr>
<tr><td>Measuring/ Reading/ Recording frequency:</td><td>Continuous/Continuous/Hourly

Continuous monitoring, flow meters in compliance with relevant standards and requirement s are used. Gas volumes, pressure, temperature and concentration are read and consolidated by a digital control system</td></tr>
<tr><td>Calculation method (if applicable):</td><td>Not applicable</td></tr>
<tr><td>QA/QC procedures applied:</td><td>All the meters/sensors are checked monthly and calibrated annually to ensure accuracy.</td></tr>
</table>

Data / Parameter:	$GEN_{BL,y}$
Data unit:	MWh
Description:	Electricity generated by the 15MW power plant during the monitoring period.
Measured /Calculated /Default:	Measured

Source of data:	Meter readings and manual records (hourly) for cross-checking
Value(s) of monitored parameter:	36,191.23
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	The readings of the meter are not used for ER calculation, but for reference only. $GEN_{BL,y}$ value will be compared against GEN_{BL} to ensure no leakage ($GEN_{BL,y} >= GEN_{BL}$). In case $GEN_{BL,y} < GEN_{BL}$, the difference will be calculated in terms of the contributing emission reductions, which will be deducted from the total claimed emission reductions. $GEN_{BL,y}$ is lower than GEN_{BL} in terms of monthly average , therefore the leakage is deducted from the total claimed ER for the monitoring period (details please refer to section E.3 and CER calculation sheet).
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Electricity meter Accuracy class: 0.5S Serial number: 200301428A0117 Calibration frequency: every 5 years Date of last calibration: 10/03/2010 Validity of calibration: 09/03/2015 Model: DSSD331 Location: refer to meter E_{BL} in figure 3
Measuring/ Reading/ Recording frequency:	Continuous/Continuous/Hourly
Calculation method (if applicable):	Not applicable
QA/QC procedures applied:	The power meter is calibrated in accordance with relevant national standard.

Monitored parameters that are not used for calculation of ER

Data / Parameter:	$MM_{total,y}$
Data unit:	tCH_4
Description:	Total amount of methane extracted in Sihe Coal Mine during the monitoring period.
Measured /Calculated /Default:	Measured
Source of data:	Measurements by project participants using gas flow meters, temperature & pressure transmitters and gas concentration meters.
Value(s) of monitored parameter:	137,271.67
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	For cross-checking
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	**Extraction station No.1** Wind velocity sensors (Pipe flow sensors) Accuracy class: ±0.3m/s; ±0.4m/s

Serial numbers		Service time in this monitoring period	Date of last calibration	Validity of calibration
720 system	509100026	Jan. 1-Mar. 29, 2011	01/04/2010	31/03/2011
	L1011069	Mar. 29-June 30, 2011	25/03/2011	24/03/2012
1m system	509050144	Jan. 1-Mar. 29, 2011	01/04/2010	31/03/2011
	L1011084	Mar. 29-June 30, 2011	25/03/2011	24/03/2012
530 system	509050178	Jan. 1-Mar. 29, 2011	01/04/2010	31/03/2011
	L1011089	Mar. 29-June 30, 2011	25/03/2011	24/03/2012
Pre-extraction	509100212	Jan. 1-Mar. 29, 2011	01/04/2010	31/03/2011

system	L1011098	Mar. 29-June 30, 2011	25/03/2011	24/03/2012
mined-area system	509050142	Jan. 1-Mar. 29, 2011	01/04/2010	31/03/2011
	L1011070	Mar. 29-June 30, 2011	25/03/2011	24/03/2012
Xiao dong shan	L10110104	Jan. 1-Mar. 29, 2011	01/04/2010	31/03/2011
	L1011080	Mar. 29-June 30, 2011	25/03/2011	24/03/2012

Calibration frequency: annual
Model: GFD15 ; GLY30
Location: refer to meter F_{EX} in figure 3

Temperature transmitters/sensors
Accuracy class: 1 grade; ≤1℃

Serial numbers		Service time in this monitoring period	Date of last calibration	Va idity of calibrat on
720 s stem	30612160	Jan. 1-Mar. 29, 2011	01/04/2 10	31/03/2011
	W1011378	Mar. 29-June 30, 2011	25/03/2011	24/03/2012
1m system	30903024	Jan. 1-Mar. 29, 2011	01/04/2010	31/03/2011
	W1011365	Mar. 29-June 30, 2011	25/03/2011	24/03/2012
530 system	30702011	Jan. 1-Mar. 29, 2011	01/04/2010	31/03/2011
	W1011368	Mar. 29-June 30, 2011	25/03/2011	24/03/2012
Pre-extraction system	30903032	Jan. 1-Mar. 29, 2011	01/04/2010	31/03/2011
	W1011364	Mar. 29-June 30, 2011	25/03/2011	24/03/2012
mined-area system	3070100127	Jan. 1-Mar. 29, 2011	01/04/2010	31/03/2011
	W1011369	Mar. 29-June 30, 2011	25/03/2011	24/03/2012
Xiao dong shan	30612157	Jan. 1-Mar. 29, 2011	01/04/2010	31/03/2011
	W1011371	Mar. 29-June 30, 2011	25/03/2011	24/03/2012

Calibration frequency: annual
Model: KGW200A(G) ; GWD100(A)
Location: refer to meter A_{EX} in figure 3

Pressure transmitters/ sensors
Accuracy class: 0.5 grade ; ±1%

Serial numbers		Service time in this monitoring period	Date of last calibration	Validity of calibration
720 system	40906092	Jan. 1-Mar. 29, 2011	01/04/2010	31/03/2011
	Y1011122	Mar. 29-June 30, 2011	25/03/2011	24/03/2012
1m system	Y1011136	Jan. 1-Mar. 29, 2011	01/04/2010	31/03/2011
	Y1011139	Mar. 29-June 30, 2011	25/03/2011	24/03/2012
530 system	40906090	Jan. 1-Mar. 29, 2011	01/04/2010	31/03/2011
	Y1011141	Mar. 29-June 30, 2011	25/03/2011	24/03/2012
Pre-extraction system	40906093	Jan. 1-Mar. 29, 2011	01/04/2010	31/03/2011
	Y1011135	Mar. 29-June 30, 2011	25/03/2011	24/03/2012
mined-area system	40906091	Jan. 1-Mar. 29, 2011	01/04/2010	31/03/2011
	Y1011129	Mar. 29-June 30, 2011	25/03/2011	24/03/2012
Xiao dong shan	40906085	Jan. 1-Mar. 29, 2011	01/04/2010	31/03/2011
	Y1011125	Mar. 29-June 30, 2011	25/03/2011	24/03/2012

Calibration frequency: annual
Model: KGY200A(G) ; GPD100
Location: refer to meter A_{EX} in figure 3

Methane sensors
Accuracy class: ＜±10% of true value

Serial numbers	Service time in this monitoring period	Date of last calibration	Validity of calibration

720 system	209050326	Jan. 1-Mar. 29, 2011	01/04/2010	31/03/2011
	21011881	Mar. 29-June 30, 2011	25/03/2011	24/03/2012
1m system	2 9050324	Jan. 1-Mar. 29, 2011	01/04/2010	31/03/2011
	21011887	Mar. 29-June 30, 2011	25/03/2011	24/03/2012
530 system	209050339	Jan. 1-Mar. 29, 2011	01/04/2010	31/03/2011
	21011883	Mar. 29-June 30, 2011	25/03/2011	24/03/2012
Pre-extraction system	20702002	Jan. 1-Mar. 29, 2011	01/04/2010	31/03/2011
	21011853	Mar. 29-June 30, 2011	25/03/2011	24/03/2012
mined-area system	208080148	Jan. 1-Mar. 29, 2011	01/04/2010	31/03/2011
	21011860	Mar. 29-June 30, 2011	25/03/2011	24/03/2012
Xiao dong shan	209050313	Jan. 1-Mar. 29, 2011	01/04/2010	31/03/2011
	21011888	Mar. 29-June 30, 2011	25/03/2011	24/03/2012

Calibration frequency: annual
Model: GJC100(A)
Location: refer to meter C_{EX} in figure 3

Extraction station No.2

V cone gas flow sensors

Accuracy class: ±1.5% for pressure and flow;
±2.5% for temperature;

Serial numbers		Service time in this monitoring period	Date of last calibration	Validity of calibration
Intake pipe (Upper)	09225	Jan. 1-June 10, 2011	11/06/2010	10/06/2011
	09228	June 10-June 16, 2011	22/06/2010	21/06/2011
	09225	June 16-June 30, 2011	13/06/2011	12/06/2012
Intake pipe (Lower)	09224	Jan. 1-June 10, 2011	11/06/2010	10/06/2011
	09229	June 10-June 16, 2011	22/06/2010	21/06/2011
	09224	June 16-June 30, 2011	13/06/2011	12/06/2012

Calibration frequency: annual
Model: GLY500
Location: refer to meter F_{EX} in figure 3

Methane concentration sensors

Accuracy class: ⩽±7% of true value

Serial numbers		Service time in this monitoring period	Date of last calibration	Validity of calibration
Intake pipe (Upper)	2845	Jan. 1-June 20, 2011	21/06/2010	20/06/2011
	1429	June 20-June 30, 2011	18/06/2011	17/06/2012
Intake pipe (Lower)	2538	Jan. 1-June 20, 2011	21/06/2010	20/06/2011
	3423	June 20-June 30, 2011	18/06/2011	17/06/2012

Calibration frequency: annual
Model: GJG100H(B)
Location: refer to meter C_{EX} in figure 3

Measuring/ Reading/ Recording frequency:	Continuous/Continuous/Hourly Continuous monitoring, flow meters in compliance with relevant standards and requirement s are used. Gas volumes, pressure, temperature and concentration are read and consolidated by a digital control system (DCS).
Calculation method (if applicable):	Not applicable

QA/QC procedures applied:	All the meters/sensors are checked monthly and calibrated annually to ensure accuracy.

Data / Parameter:	$MM_{release,y}$
Data unit:	tCH_4
Description:	Total amount of methane still released to the atmosphere during the monitoring period
Measured /Calculated /Default:	Measured
Source of data:	Measurements by project participants using gas flow meters, temperature & pressure transmitters and gas concentration meters.
Value(s) of monitored parameter:	14,215.70
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	For cross-checking
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	**Extraction station No.1** V cone gas flow sensor Accuracy class: ±1.5% for pressure and flow; ±2.5% for temperature;

Serial number	Service time in this monitoring period	Date of last calibration	Validity of calibration
101300	Jan. 1-May 19, 2011	25/05/2010	24/05/2011
09096	May 19-June 30, 2011	15/05/2011	14/05/2012

Calibration frequency: annual
Model: GLY500
Location: refer to meter F_{EX} in figure 3

Methane concentration sensors
Accuracy class: ⩽±7% of true value

Serial number	Service time in this monitoring period	Date of last calibration	Validity of calibration
2877	Jan. 1-May 19,2011	25/05/2010	24/05/2011
2890	May 19-June 30, 2011	15/05/2011	14/05/2012

Calibration frequency: annual
Model: GJG100H(B)
Location: refer to meter C_{EX} in figure 3

Extraction station No.2
V cone gas flow sensor
Accuracy class: ±1.5% for pressure and flow;
±2.5% for temperature;

Serial numbers		Service time in this monitoring period	Date of last calibration	Validity of calibration
Venting pipe (Left)	09226	Jan. 1-June 4, 2011	05/06/2010	04/06/2011
	09228	June 4-10, 2011	22/06/2010	21/06/2011
	09226	June 10-30, 2011	07/06/2011	06/06/2012
Venting pipe (Right)	09227	Jan. 1-June 16, 2011	17/06/2010	16/06/2011
	09228	June 16-21, 2011	22/06/2010	21/06/2011
	09227	June 21-30, 2011	19/06/2011	18/06/2012
Pressuring pump venting pipe	09173	Jan. 1-June 4, 2011	05/06/2010	04/06/2011
	09229	June 4-10, 2011	22/06/2010	21/06/2011

<table>
<tr><td></td><td>
<table>
<tr><td></td><td>09173</td><td>June 10-30, 2011</td><td>07/06/2011</td><td>06/06/2012</td></tr>
</table>
Calibration frequency: annual
Model: GLY500
Location: refer to meter F_{EX} in figure 3

<u>Methane concentration sensors</u>
Accuracy class: ⩽±7% of true value
<table>
<tr><th colspan="2">Serial numbers</th><th>Service time in this monitoring period</th><th>Date of last calibration</th><th>Validity of calibration</th></tr>
<tr><td rowspan="2">Venting pipe (left)</td><td>2776</td><td>Jan. 1-June 20, 2011</td><td>21/06/2010</td><td>20/06/2011</td></tr>
<tr><td>3430</td><td>June 20-30, 2011</td><td>18/06/2011</td><td>17/06/2012</td></tr>
<tr><td rowspan="2">Venting pipe (rig t)</td><td>2574</td><td>Jan. 1-June 20, 2011</td><td>21/06/2010</td><td>20/06/2011</td></tr>
<tr><td>2855</td><td>June 20-30, 2011</td><td>18/06/2011</td><td>17/06/2012</td></tr>
<tr><td rowspan="2">Pressuring pump venting pipe</td><td>2808</td><td>Jan. 1-June 20, 2011</td><td>21/06/2010</td><td>20/06/2011</td></tr>
<tr><td>1398</td><td>June 20-30, 2011</td><td>18/06/2011</td><td>17/06/2012</td></tr>
</table>
Calibration frequency: annual
Model: GJG100H(B)
Location: refer to meter C_{EX} in figure 3</td></tr>
<tr><td>Measuring/ Reading/ Recording frequency:</td><td>Continuous/Continuous/ Hourly

Continuous monitoring, flow meters in compliance with relevant standards and requirement s are used. Gas volumes, pressure, temperature and concentration are read and consolidated by a digital control system (DCS).</td></tr>
<tr><td>Calculation method (if applicable):</td><td>Not applicable</td></tr>
<tr><td>QA/QC procedures applied:</td><td>All the meters/sensors are checked monthly and calibrated annually to ensure accuracy.</td></tr>
</table>

SECTION E. Emission reductions calculation

E.1. Baseline emissions calculation

>>

Baseline emissions can be calculated using the formulae below in accordance with the registered PDD:

$$BE = BE_{MD} + BE_{MR} + BE_{Use} \quad (7)$$

Where:

BE	Baseline emissions (tCO_2e)
BE_{MD}	Baseline emissions from destruction of methane in the baseline scenario (tCO_2e)
BE_{MR}	Baseline emissions from release of methane into the atmosphere that is avoided by the project activity (tCO_2e)
BE_{Use}	Baseline emissions from power generation replaced by this project (tCO_2e)

And:

$$BE_{MD}^{5} = 0$$

$$BE_{MR} = 21 \times MM_{ELEC} \quad (10)$$

$$BE_{Use} = (GEN_{1,y} - GEN_{2,y}) \times EF_{ELEC} \quad (11)$$

[5] See PDD page 25-26.

Where:

$GEN_{1,y}$	Electricity supplied by project activity to North China Grid (MWh)
$GEN_{2,y}$	Electricity consumed by project activity which is supplied by North China Grid in case of emergency (MWh)
EF_{ELEC}	Emission factors of North China Grid (0.98255 tCO_2e/MWh)

GEN_1 and GEN_2 are continuously measured both in 120MW Power Plant and Grid Company by bidirectional electricity meters. The recordings in the form of Settlement Notice issued by the Grid Company (monthly) are used for calculation and the data manually recorded by JMC hourly are used for cross-checking and backup.

Using the measured data, the results of baseline emissions during monitoring period are shown below:

Table 3: Calculation of baseline emissions

Monitoring Period	**MM_{ELEC}** (tCH_4)	**GEN_1** (MWh)	**GEN_2** (MWh)	**BE_{MD} (tCO_2e)**	**BE_{MR} (tCO_2e)**	**BE_{Use} (tCO_2e)**	**BE (tCO_2e)**
	Measured values			**A**	**B**	**C**	**D = A+B+C**
01/01/2011-31/01/2011	9,544.58	52,578.768	0	0	200,436.18	51,661.27	252,097.44
01/02/2011-28/02/2011	10,483.40	62,834.640	0	0	220,151.40	61,738.18	281,889.57
01/03/2011-31/03/2011	12,801.15	76,165.056	0	0	268,824.15	74,835.98	343,660.12
01/04/2011-30/04/2011	10,241.92	63,214.800	4.752	0	215,080.32	62,107.03	277,187.35
01/05/2011-31/05/2011	12,457.76	77,947.584	0	0	261,612.96	76,587.40	338,200.35
01/06/2011-30/06/2011	12,031.81	73,705.104	0	0	252,668.01	72,418.95	325,086.95
Total	**67,560.62**	**406,445.952**	**4.752**	**0**	**1,418,773.02**	**399,348.80**	**1,818,121.78**

Therefore, the total baseline emissions during the monitoring period are **1,818,121.78**tCO_2e.

E.2. Project emissions calculation

>>

Project emissions are calculated with formulae below in accordance with the registered PDD**.**

$$PE = PE_{ME} + PE_{MD} + PE_{UM} \quad (1)$$

Where:

PE	Project emissions (tCO_2e)
PE_{ME}	Project emissions from energy use to capture and use methane (tCO_2e)
PE_{MD}	Project emissions from methane destroyed (tCO_2e)
PE_{UM}	Project emissions from un-combusted methane (tCO_2e)

And:

$$PE_{ME}=CONS_{ELEC,PJ}\times CEF_{ELEC}=0 \quad (2)^{6}$$

$$PE_{MD}=MD_{ELEC}\times (CEF_{CH4}+r\times CEF_{NMHC}) \quad (3)$$

As the NMHC concentration is less than 1% of the coalmine gas throughout the monitoring period, thus the combustion emissions from non-methane hydrocarbons can be ignored[7] (r=0).

Therefore,

$$PE_{MD}=MD_{ELEC}\times CEF_{CH4}=(MM_{ELEC}\times Eff_{ELEC})\times CEF_{CH4}=(MM_{ELEC}\times 0.995)\times 2.75$$

$$PE_{UM}=GWP_{CH4}\times MM_{ELEC}\times (1-Eff_{ELEC})=21\times MM_{ELEC}\times (1-0.995) \quad (6)$$

Where:

$CONS_{ELEC}$	Additional electricity consumption for use of methane (MWh)
MD_{ELEC}	Methane destroyed through power generation (tCH_4)
MM_{ELEC}	Methane measured delivered to power plant (tCH_4)
CEF_{CH4}	Carbon emission factor for combusted methane (tCO_2e/tCH_4)
Eff_{ELEC}	Efficiency of methane destruction /oxidation in power plant

The results of project emissions calculation during monitoring period are shown in the Table 4.

Table 4: Calculation of project emissions

Monitoring Period	PE_{ME} (tCO_2e)	PE_{MD} (tCO_2e)	PE_{UM} (tCO_2e)	PE (tCO_2e)
	A	B	C	D=A+B+C
01/01/2011-31/01/2011	0	26,116.36	1,002.18	27,118.54
01/02/2011-28/02/2011	0	28,685.20	1,100.76	29,785.97
01/03/2011-31/03/2011	0	35,027.15	1,344.12	36,371.27
01/04/2011-30/04/2011	0	28,024.45	1,075.40	29,099.86
01/05/2011-31/05/2011	0	34,087.55	1,308.06	35,395.62
01/06/2011-30/06/2011	0	32,922.04	1,263.34	34,185.39
Total	**0**	**184,862.75**	**7,093.87**	**191,956.65**

Therefore, the total project emissions during the monitoring period are **191,956.65** tCO_2e.

E.3. Leakage calculation

>>

As described in the PDD (page 29), the leakage of this project is 0.

In addition, for the experimental 15MW power plant, $GEN_{BL,y}$, the electricity generated by the 15MW power plant has been monitored and the volume during this monitoring period is 36,191.23 MWh. The monthly average is 6,031.87 MWh. $MM_{BL,y}$, the volume of methane sent to the 15MW power plant has been monitored and the value for this monitoring period is 11,462.08 tCH_4. The monthly average is 1,910.35tCH_4.

[6] When calculating the ER, the net electricity delivered to the grid is used (as per PDD, page 22).

[7] The NMHC concentration will continue being monitored annually to check whether its concentration is below or above 1% to determine if the NMHC combustion be included in the project emissions.

Table 5 shows that the monthly average values of both the electricity generation and methane consumption of 15 MW power plant for this monitoring period are lower than the monthly average values in year 2008[8], respectively. The decrease in both electricity generation and methane consumption is mainly due to the malfunction of the equipment and production shutdown for repair and maintenance.

Table 5: Experimental 15MW power plant data comparison

Parameter **Period**	**$MM_{BL,y}$ (tCH_4)** **01/01/2011-30/06/2011**	**MM_{BL} (tCH_4)** **01/01/2008-31/12/2008**	**$GEN_{BL,y}$ (MWh)** **01/01/2011-30/06/2011**	**GEN_{BL} (MWh)** **01/01/2008-31/12/2008**
Total	11,462.08	24,139.73	36,191.23	86,089.23
Monthly Average	1,910.35	2,011.64	6,031.87	7,174.10

According to the description of section D.2, In case $MM_{BL,y} < MM_{BL}$, the difference will be calculated in terms of the contributing emission reductions, which will be deducted from the total claimed emission reductions. In case $GEN_{BL,y} < GEN_{BL}$, the difference will be calculated in terms of the contributing emission reductions, which will be deducted from the total claimed emission reductions. The contributing emission reductions can be calculated through the same formula adopted in section E.1, E.2 and E.4 for regular emission reductions calculations. There are only 2 differences: Where MM_{ELEC} appears in the formulae, it is replaced by (MM_{BL}-$MM_{BL,y}$); where ($GEN_{1,y} - GEN_{2,y}$) appears, it is replaced by (GEN_{BL}-$GEN_{BL,y}$). To differentiate, the replaced variables in formula in section E.1 E.2 and E.4 were asterisked in the following Table 6, 7 and 8.

Table 6: Calculation of contributing Baseline Emissions

Monitoring Period	**$MM_{BL,y}$ (tCH_4)**	**MM_{BL} (tCH_4)**	**$GEN_{BL,y}$ (MWh)**	**GEN_{BL} (MWh)**	***BE_{MD} (tCO_2e)**	***BE_{MR} (tCO_2e)**	***BE_{Use} (tCO_2e)**	***BE (tCO_2e)**
	Measured values	Monthly Average in year 2008	Measured values	Monthly Average in year 2008	**A**	**B**	**C**	**D = A+B+C**
01/01/2011-31/01/2011	2,624.45	2,011.64	8,862.00	7,174.10	0	0.00	0.00	0.00
01/02/2011-28/02/2011	2,123.67	2,011.64	7,334.32	7,174.10	0	0.00	0.00	0.00
01/03/2011-31/03/2011	2,103.39	2,011.64	6,987.96	7,174.10	0	0.00	182.89	182.89
01/04/2011-30/04/2011	1,527.74	2,011.64	4,397.58	7,174.10	0	10,161.99	2,728.07	12,890.06
01/05/2011-31/05/2011	1,370.98	2,011.64	3,380.58	7,174.10	0	13,453.95	3,727.33	17,181.27
01/06/2011-30/06/2011	1,711.85	2,011.64	5,228.79	7,174.10	0	6,295.68	1,911.37	8,207.04
Total	**11,462.08**		**36,191.23**		**0**	**29,911.61**	**8,549.66**	**38,461.27**

Table 7: Calculation of contributing Project Emissions

Monitoring Period	***PE_{ME} (tCO_2e)**	***PE_{MD} (tCO_2e)**	***PE_{UM} (tCO_2e)**	***PE (tCO_2e)**
	A	**B**	**C**	**D=A+B+C**

[8] Year 2008 was the year with the highest annual values for both MM_{BL} and GEN_{BL} during the period (year 2005-2008) before this project activity was commissioned in 2009. Applying the highest annual values for both MM_{BL} and GEN_{BL} ensure the conservativeness of the CER results. Please also refer to section D.2 of the MR.

01/01/2011-31/01/2011	0	0.00	0.00	0.00
01/02/2011-28/02/2011	0	0.00	0.00	0.00
01/03/2011-31/03/2011	0	0.00	0.00	0.00
01/04/2011-30/04/2011	0	1,324.08	50.81	1,374.89
01/05/2011-31/05/2011	0	1,753.02	67.27	1,820.29
01/06/2011-30/06/2011	0	820.31	31.48	851.79
Total	**0**	**3,897.41**	**149.56**	**4,046.97**

Table 8: Total contributing Emission Reductions

Monitoring Period	*PE (tCO_2e)	*BE (tCO_2e)	*ER (tCO_2e)
	A	**B**	**D = B-A**
01/01/2011-31/01/2011	0.00	0.00	0
01/02/2011-28/02/2011	0.00	0.00	0
01/03/2011-31/03/2011	0.00	182.89	182.90
01/04/2011-30/04/2011	1,374.89	12,890.06	11,515.17
01/05/2011-31/05/2011	1,820.29	17,181.27	15,360.99
01/06/2011-30/06/2011	851.79	8,207.04	7,355.26
Total	**4,046.97**	**38,461.27**	**34,414.32**

For details of calculation of contributing ERs, please see the worksheet "Project Leakage" in the CER calculation spreadsheet.

E.4. Emission reductions calculation / table

>>

Total emission reductions are calculated as:

$$ER = BE - PE \quad (16)$$

Where:

ER	Emissions reductions of the project activity (tCO_2e)
BE	Baseline emissions (tCO_2e)
PE	Project emissions (tCO_2e)

In addition, the total contributing emission reductions which have been calculated in section E.3 should be deducted as leakage from the total emission reductions as per the description of section D.2. Therefore, the formulae for total emission reductions is further modified as:

$$ER = BE - PE - LE \quad (17)$$

Where:

ER	Emissions reductions of the project activity (tCO_2e)
BE	Baseline emissions (tCO_2e)
PE	Project emissions (tCO_2e)
LE	Leakage (tCO_2e)

The results of emission reduction calculation for the monitoring period are shown in the Table 9.

Table 9: Total Emission Reductions

Monitoring Period	BE (tCO_2e)	PE (tCO_2e)	LE (tCO_2e)	ER (tCO_2e)
	A	**B**	**C**	**D = A-B-C**
01/01/2011-31/01/2011	252,097.44	27,118.54	0.00	224,979

01/02/2011-28/02/2011	281,889.57	29,785.97	0.00	252,104
01/03/2011-31/03/2011	343,660.12	36,371.27	182.90	307,106
01/04/2011-30/04/2011	277,187.35	29,099.86	11,515.17	236,572
01/05/2011-31/05/2011	338,200.35	35,395.62	15,360.99	287,444
01/06/2011-30/06/2011	325,086.95	34,185.39	7,355.26	283,546
Total	**1,818,121.78**	**191,956.65**	**34,414.32**	**1,591,750**

The emission reductions resulting from the actually measured values are **1,591,750** tCO_2e.

E.5. Comparison of actual emission reductions with estimates in the CDM-PDD

>>

Item	Values applied in ex-ante calculation of the registered CDM-PDD	Actual values reached during the monitoring period
Emission reductions[9] (tCO_2e)	**1,495,960**	**1,591,750**

E.6. Remarks on difference from estimated value in the PDD

>>

The ER volume based on the actual monitored values is 1,591,750 tCO_2e, or 6.4% higher than the ex-ante estimation according to the registered PDD. The major factor which leads to the increase in the actual emission reductions during the current monitoring period is the gas consumption ratio (gas consumption per electricity generation). The table 10 below shows that the actual project operation resulted in lower power generation but higher gas consumption when compared to the PDD estimation. The gas consumption ratio normally fluctuates, reflecting the ever-changing working conditions[10] (i.e. load factor, ambient temperature, etc) of the gas engine. The average of the actual gas consumption ratio is higher than the gas consumption ratio estimated in the PDD. More gases were consumed and it consequently resulted in the slight increase of the ER volume. On the other hand, the gas consumption ratio adopted in the registered PDD was underestimated. At the time of project design, there were no other projects that employed the same advanced and imported technology. The gas consumption is estimated based on the experimental data provided by the equipment supplier, Caterpillar.

In reality, according to the data from Caterpillar's technical specification provided years later (which was not available at the time of project design, the gas consumption ratio is $0.175tCH_4/MWh$[11], which is close to the actual gas consumption ratio: $0.166tCH_4/MWh$ during this monitoring period. It has demonstrated that the value in the PDD (0.148 tCH_4/MWh) was markedly underestimated.

Table 10: Comparison of actual result with ex ante PDD estimate

	ER Volume (tCO2e) (181 days)[12]	Power Generation (MWh) (181 days)	Gas Consumption (tCH4) (181 days)

[9] The ex ante amount is calculated taking into account the number of days covered by the monitoring period (181) as follows: [3,016,714 tCO_2e * 181 days/ 365 days], assuming that the ER generation is evenly distributed throughout the year. (3,016,714 is the estimated annual ER amount as per the PDD).

[10] Technical specification of the generation unit provided by the manufacturer indicates the gas consumption ratio (gas consumption per electricity generation) is dependent on the load factor, temperature and other parameters.

[11] Gas consumption ratio (tCH_4/MWh) = Heat consumption (MJ/MWh) / lower heat value of CH_4 (35.16 MJ/m^3)* density of CH_4 0.67 kg/m^3)

[12] The PDD estimated ER Volume, Power Generation and Gas Consumption values shown in Table 10 have already been proportionate to the number of days for the fifth monitoring period (181 days).

Actual	1,591,751	406,441.20	67,560.62
PDD Estimate	1,495,960	408,216.99	60,294.32
% increase	6.40%	-0.44%	12.05%

In spite of the increase of gas consumption, there is no impact on the additionality of the project and the applicability of the methodology as demonstrated below.

1. Impact on the project additionality

In the registered PDD, the project additionality was justified mainly based on the investment analysis. In the investment analysis, the calculated project IRR was used to compare with the benchmark project IRR of 15%[13]. In the subsequent sensitivity analysis in the PDD, Annual amount of electricity delivered to the grid was identified as a sensitive parameter to the result of project IRR. According to the sensitivity analysis, only when the annual amount of electricity delivered to the grid increases over 17.9%[14] of its base case, the project IRR would come across the benchmark project IRR which is 15%, hence causing the project not additional. As clearly indicated in Table 10 above, the project's actual annual electricity delivered to the grid is 0.44% lower than the PDD estimation. Therefore, the financial additionality of project does not change. On the other hand, provided that the gas consumption was not included as a component in the project IRR calculation, the increase of gas consumption will not influence the financial additionality. Therefore, the additionality of the project stands.

Besides the financial aspect, the conclusion from common practice analysis in the PDD still holds as the project's size remains 120 MW power plant fuelled by coal mine methane (The largest CMM power generation project in China[15] at the time of submission for registration).

In conclusion, the increase of power generation and CMM gas consumption does not affect the project's additionality upon reassessing the investment analysis and common practice analysis.

2. Impact on the applicability of the methodology

The project has been validated that it met all the applicability criteria of the baseline methodologies ACM0008-version 3 as the project a) extracts CMM by ventilation, pre-mining and post-mining b) utilizes the captured CMM to generate and export electricity c) The extracted CMM is from an underground working coal mine and there is no CBM drainage involved in the project[16].

The actual project operation during this monitoring period (01/01/2011-30/06/2011) does not change any of the aforementioned dimensions and therefore still meets all the applicability criteria of the baseline methodology. As a result, the baseline methodology remains applicable.

- - - - -

[13] Source: "Methods and Parameters for Economic Evaluation of Construction Project (Edition 2)", published by the China National Planning Commission and Ministry of Construction, China Planning Press, July 1993.

[14] Please refer to page 22 of the registered PDD of the project dated 20/04/2009.

[15] Please refer to page 23 of the registered PDD of the project dated 20/04/2009.

[16] Please refer to page 7 of the Validation Report by DNV dated 22/10/2006.

Revision History of Monitoring Report

Version	Date	Nature of revision
01	07/02/2012	For publishing