CER Monitoring Report

Waste gases utilisation for Combined Cycle Power Plant in Handan Iron & Steel Group Co., Ltd

(Registration Reference No. 1262)

Monitoring period

15/10/2007 ~ 29/02/2008

(first periodic verification)

Date of monitoring report: 20/08/2008

Contents

SECTION A. General Project Activity Information

A.1. Title of the project activity:

Waste gases utilisation for Combined Cycle Power Plant in Handan Iron & Steel Group Co., Ltd

A.2. Project Category

The project activity falls into sectoral scope1 – Energy Industries (renewable/non-renewable sources).

A.3. Geographic Location

The project is located within the Handan Iron & Steel Group Co., Ltd. The site is at distance of 2 km northwest of Handan city, Hebei Province, People's Republic of China. The project's geographical co-ordinates are east longitude 114º26' 34″and northern latitude 36º36'28″.

Figure 1 Map of Hebei Province Showing Project Activity Location

A.4. Short description of the project activity:

The project activity is located within Handan Iron & Steel Group Co., Ltd in Handan City, Hebei Province, People's Republic of China. The objective of the project activity is to capture waste gases from the steel-making process and to utilize the waste gases in a new combined cycle power plant (CCPP) specifically designed and installed for this purpose. The power generated by the project activity is supplied to Handan Iron & Steel Group Co., Ltd –which otherwise would have been met by power from North China Power Grid which the project is connected to.

The project activity adopts CCPP technology to generate electricity through combusting waste excess blast furnace gas (BFG) and coke oven gas (COG), which were previously flared and vented to the atmosphere. The power generated by this project activity will replace the major quantity of electricity that could have been generated by greenhouse gas (GHG) intensive fossil fuel power plant, thus GHG emission reductions could be achieved.

A.5. Methodology applied to the project activity for the current period:

The project activity uses the approved Consolidated methodology ACM0004 titled "**Consolidated baseline methodology for waste gas and/or heat and/or pressure for power generation**" and "**Consolidated monitoring methodology for waste gas and/or heat and/or pressure for power generation**"(version 2, March 2006)

This methodology also refers to ACM0002 (version 6) "**Consolidated baseline methodology for grid-connected electricity generation from renewable sources**" and the latest version of the "**Tool for the demonstration and assessment of additionality**" (version 3).

A.6. Calculation Methodology (Including Secondary Effects/Leakage)

Project Emissions

Project Emissions are applicable only if auxiliary fuels are fired for generation startup, in emergencies, or to provide additional heat gain before entering the Waste Heat Recovery Boiler.

Project Emissions are given as:

$$PE_y = \sum_i Q_i \times NCV_i \times EF_i \times \frac{44}{12} \times OXID_i \quad (1)$$

Where:

PE_y Project emissions in year y (tCO_2)

Q_i Mass or volume unit of fuel *i* consumed (m^3)

NCV_i Net calorific value per mass or volume unit of fuel *i* (TJ/ m^3)

EF_i Carbon emissions factor per unit of energy of the fuel *i* (tC/TJ)

$OXID_i$ Oxidation factor of the fuel *i* (%)

In this project activity, the auxiliary fuel is waste coke oven gas(COG). The COG used in the project activity is in small amount and they are excess waste gas. If they were not used in the project acitivity as auxiliary fuel, they would be flared to the atmosphere. Therefore the project emission is not considered.

Baseline Emissions

Baseline emissions are given as:

$$BE_{electricity,y} = EG_y \times EF_{electricity,y} \quad (2)$$

Where:

EG_y Net quantity of electricity supplied to the manufacturing facility by the project during the year *y* in MWh;

$EF_{electricity,y}$ CO_2 baseline emission factor for the electricity displaced due to the project activity during the year *y* (tCO_2/MWh).

In determining the *net* quantity of electricity supplied, project participants shall subtract the quantity of electricity required for the operation of the power plant.

If the baseline scenario is determined to be grid power supply, the Emissions Factor for displaced electricity is calculated as in ACM0002. In order to give facilities for the project owner to develop the CDM project, the DNA has confirmed the baseline emission factor (EF_y) of the regional power grid of China. Data and parameters (e.g. emission factors) that are available at validation are included in the registered PDD

Leakage Emissions

These are not considered.

Estimation of emission reduction:

The project activity mainly reduces carbon dioxide through substitution of grid electricity generation with fossil fuel fired power plants. The emission reduction ER_y by the project activity

during a given year *y* is the difference between the baseline emissions though substitution of electricity generation with fossil fuels *(BE_y)* and project emissions *(PE_y)*, as follows:

$$ER_y = BE_y - PE_y \quad (3)$$

Where:

ER_y the emissions reductions of the project activity during the year *y* in tons of CO_2, and

BE_y the baseline emissions due to displacement of electricity during the year *y* in tons of CO_2, and

PE_y the project emissions during the year *y* in tons of CO_2

SECTION B. Key monitoring activities

B.1. Parameters Monitored

Data / Parameter:	EG_{GEN}
Data unit:	MWh/yr
Description:	Total Electricity Generated
Source of data to be used:	Measured
Value of data applied for the purpose of calculating expected emission reductions in section B.5	705,600
Description of measurement methods and procedures to be applied:	Once the project is fully operational, the Total Electricity Generated by the project is measured at a total of four meters (M1,M2,M3,M4). A line diagram of this Project showing each generation block, metering points, bus bar and connections to each (named) substation is provided in CDM Monitoring & Quality Control Manual. The meters will measure power generated on a continuous basis. The Total Electricity Generated shall be the sum of all metered generation. EG_{GEN} = M1 + M2 +M3 +M4. The Energy Power plant Division shall be responsible for record keeping relating to on site data collection and keeping.
QA/QC procedures to be applied:	The meter(s) used to measure the electricity generated by the project is in accordance with the National Guidelines for accuracy and reliability. The meters accuracy rate shall be 0.2s. Power meters must be calibrated by certified Party at least once per year in accordance with manufacturer's recommendations and National Regulations for ensuring reliability of the system. Calibrations shall be evidenced with certificates of calibration for the relevant meter(s) issued by a qualified body. In case there are errors found in calibration or during the regular checks, the malfunctioning meter or component shall be repaired or replaced immediately in accordance with the manufacturers instructions, and all data recorded since the last recorded successful check or calibration shall be declared void. Back up third party meters and data have been identified as alternative sources in case the first data set is not within specified error limits.
Any comment:	This data is used for the calculation of the baseline emissions.

Data / Parameter:	EG_{AUX}

Data unit:	MWh/yr
Description:	Auxiliary Electricity
Source of data to be used:	Measured
Value of data applied for the purpose of calculating expected emission reductions in section B.5	28,200
Description of measurement methods and procedures to be applied:	Once the project is fully operational, the electrical energy utilized by the power generating equipment in the project boundary is measured at a total of twenty meters (M7,M8,M9…….M26). The meters will measure auxiliary electricity on a continuous basis. The auxiliary electricity shall be the sum of all metered generation. EG_{AUX} = M7 + M8 +M9+……. +M26 The Energy Power plant Division shall be responsible for record keeping relating to on site data collection and keeping.
QA/QC procedures to be applied:	The meter(s) used to measure the electricity generated by the project is in accordance with the National Guidelines for accuracy and reliability. The meters accuracy rate shall be 0.2s. Power meters must be calibrated by certified Party at least once per year in accordance with manufacturer's recommendations and National Regulations （Verification Regulation of Electrical Energy Meters with Electronics JJG596-1999)for ensuring reliability of the system. Calibrations shall be evidenced with certificates of calibration for the relevant meter(s) issued by a qualified body. In case there are errors found in calibration or during the regular checks, the malfunctioning meter or component shall be repaired or replaced immediately in accordance with the manufacturers instructions, and all data recorded since the last recorded successful check or calibration shall be declared void. Back up third party meters and data have been identified as alternative sources in case the first data set is not within specified error limits.
Any comment:	This data is used for the calculation of the baseline emissions.

Data / Parameter:	EG_y
Data unit:	MWh/yr
Description:	Net Electricity supplied to facility
Source of data to be used:	Calculated ($EG_{GEN} - EG_{AUX}$)
Value of data applied for the purpose of calculating expected emission reductions in section B.5	677,400
Description of measurement methods and	Once the project is fully operational, the net electrical supplied to facility by the project is calculated based on the EG_{GEN} and EG_{AUX} measured.

procedures to be applied:	$EG_y = EG_{GEN} - EG_{AUX}$ The Energy Power plant division shall be responsible for record keeping relating to onsite data collection, keeping and calculating.
QA/QC procedures to be applied:	In the event that any of the onsite meters has operated outside its error limit, then the data from the respective meter (M5 and M6) shall be used to monitor the net electricity supplied to facility for the period since the last successful calibration of the onsite meter. EG=(M5+M6) Where M5 is the net electricity supply measured on First Block, and M6 is the net electricity supply measured on Second Block.
Any comment:	This data is used for the calculation of the baseline emissions.

B.2.Description of the monitoring plan

1. The purpose of the monitoring plan

In order to achieve the real, credible certified emission reduction (CERs) of the project design document has calculated, it needs the managers of the Handan Iron & Steel Group Co., Ltd to ensure the safe operation of the power plant, to satisfy the information need of the DOE for verifying project as part of verification and certification process, to establish and maintain the appropriate monitoring system.

2. The user of the monitoring plan

This monitoring plan is implemented by the project entity, Handan Iron & Steel Group Co., Ltd

3. The duration of the monitoring report

The monitoring duration is from October 15, 2007 to February 29, 2008.

4. Metering system

The main content of metering:

- Total Electricity Generated is monitored and recorded hourly.
- Auxiliary Electricity is monitored and recorded hourly.

The meter(s) used to measure the Electricity Generated and Auxiliary Electricity by the project is in accordance with the National Guidelines for accuracy and reliability. The meters accuracy rate is 0.2s. Power

meters were calibrated by eligible entity once a year in accordance with manufacturer's recommendations and National Regulations （Verification Regulation of Electrical Energy Meters with Electronics JJG596-1999） for ensuring reliability of the system.

Total Electricity Generated by the project is measured at a total of four meters (M1, M2,M3,M4). The meters measure power generated on a continuous basis. The Total Electricity Generated shall be the sum of all metered generation.

EG_{GEN} = M1 + M2 +M3 +M4.

The electrical energy utilized by the power generating equipment in the project boundary is measured at a total of twenty meters (M7, M8, M9…….M26).

The meters measure auxiliary electricity on a continuous basis. The auxiliary electricity shall be the sum of all metered generation.

EG_{AUX} = M7 + M8 +M9+……. +M26

The Net Electricity supplied to facility by the project is calculated based on the EG_{GEN} and EG_{AUX} measured.

EG_y= EG_{GEN} -EG_{AUX}

In the event that any of the onsite meters has operated outside its error limit, then the data from the respective meter (M5 and M6) shall be used to monitor the Net Electricity supplied to facility for the period since the last successful calibration of the onsite meter.

EGy = (M5 + M6)

Where M5 is the net electricity supply measured on First Block, and M6 is the net electricity supply measured on Second Block.

During the monitoring period (October 15, 2007 to February 29, 2008), all the meters operate well. So the Emission Reduction shall be calculated using the first calculation method, namely, the difference of EG_{GEN} and EG_{AUX}

5. Information collection and management

All data is collected by the energy technology research department.

Physical document is stored by the project owner and kept at least one copy in order to facilitate the verification of DOE.

6. Management operation

The energy technology research department is requested to be responsible for all interrelated CDM activity.

This is on going process that ensured by the CDM mechanism in terms of need for verification emission on the annual basis.

Figure 3 outlines the operational and management structure of the project owner is implement for the project activity and for the monitoring of emissions reductions generated by the project activity.

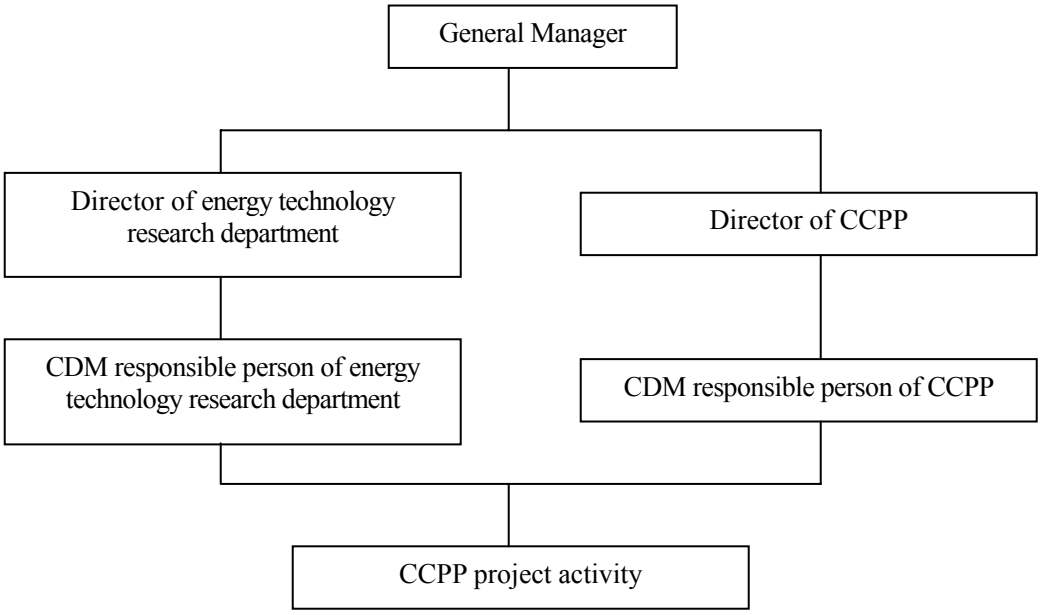


Figure 3. Operational and Management Structure for Monitoring the Project Activity

SECTION C. Quality assurance and quality control measures

C.1. Documented procedures and management plan:

1. Roles and responsibilities:

The operational and management structure (as shown in below the Table) and the responsibilities of the principals are as follows:
Ultimate responsibility for the project rests with Mr Liu Rujun, Chairman of Handan Iron & Steel Group Co., Ltd.
Mrs. Zhang Rui, The Deputy Director of Technology Center and Mr. Jia Quanru, The Deputy Manager of the Iron Making Division in Handan Iron & Steel Group Co., Ltd will exercise oversight on behalf of the Chairman.
The nominated CDM responsible person for the project is Mr. Ma Yongqiang who is responsible for monitoring plan implementation.
Responsibilities for specific activities within this monitoring plan are as follows:

Activity	**Responsible Division**	**Responsible Person**
Overall Management -Preparation of External Reports -CER Calculation -Third party metered data	Technology Center	Mr. Ma Yongqiang
-On site electricity meter maintenance -Maintaining meter logs -Data aggregation and record keeping	Energy Power Plant Division	Li Jianjun
-Recording and keeping of metered power generation	Energy Power Plant Division	Niu Shexia

-Third Party Power Generation Invoices	Financial Division	Xu Dongmei

C.2. Internal audits and control measures:

Power meters were calibrated by eligible entity once per year in accordance with manufacturer's recommendations and National Regulations for ensuring reliability of the system. Calibrations is evidenced with certificates of calibration for the relevant meter.

The Director of the Metering Management Division shall be responsible for the management of the meter maintenance procedures.

Table 2: Uncertainty Levels and QA/QC Procedures

Data	Uncertainty level of data (High/Medium/Low)	QA/QC procedures planned for these data (or why such procedures are not necessary)
EG_{GEN}	Low	Regular checks on proper functioning of measuring equipment and calibrations of meters by qualified parties is carried out in line with manufacturer's specifications.
EG_{AUX}	Low	Regular checks on proper functioning of measuring equipment and calibrations of meters by qualified parties is carried out in line with manufacturer's specifications.
EG_y	Low	Derived from EG_{GEN} and EG_{AUX}

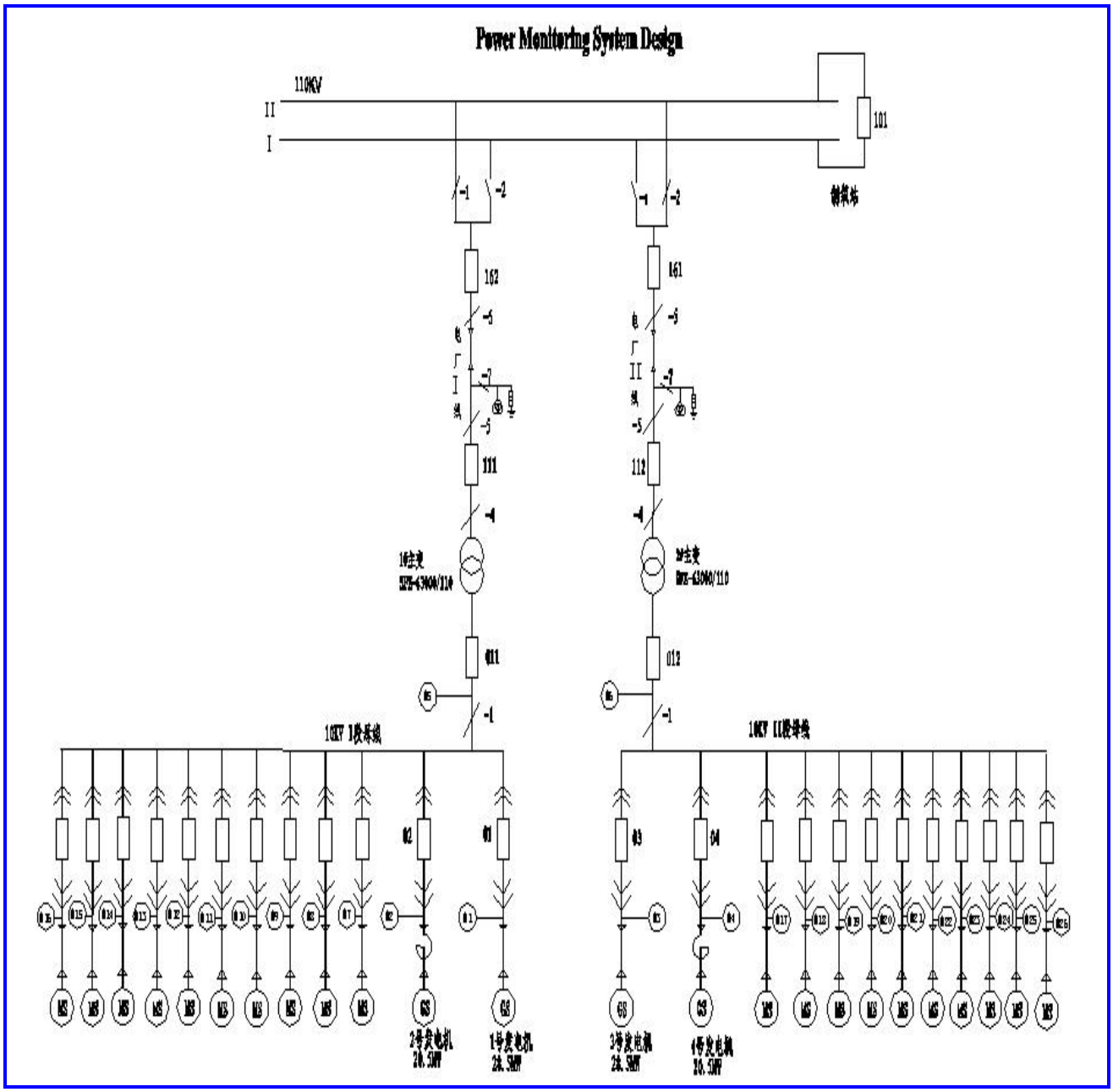
SECTION D. Calculation of GHG emission reductions

Summary of the emissions reductions during the monitoring period:

Meter reading (MWh)	15/10/2007 00：00 to 31/10/2007 24：00	Nov-07	Dec-07	Jan-08	Feb-08
M1	8628.35	11874.8	13189.45	11958.65	7872.45
M2	7147.44	9320.12	10621	9393.48	6886.12
M3	7914.85	11729.4	12800.75	11090.35	7770.7
M4	6353.2	8842.16	10533.56	8562.72	6817.4
A：Subtotal electricity generation EG_{GEN} = M1 + M2 + M3 + M4	30043.84	41766.48	47144.76	41005.2	29346.67
M7	233.252	412.18	449.556	419.996	315.656
M8	55.26	81.092	73.7	111.264	96.72
M9	0.004	6.34	11.064	4.648	5.856
M10	194.508	277.364	332.528	299.292	250.2
M11	134.796	169.376	17.26	218.692	94.388
M12	1.116	13.848	189.712	20.548	72.024
M13	175.512	81.08	51.956	21.252	3.992
M14	0.004	236.336	44.744	22.58	271.388
M15	183.02	232.5	99.4	21.62	288.22
M16	0	0	0	0	0
M17	283.852	409.64	402.576	377.152	418.568
M18	109.772	183.5	137.06	122.308	104.02
M19	3.256	11.712	6.596	6.444	5.624
M20	190.424	310.216	336.932	265.26	237.536
M21	105.628	174.268	47.108	155.052	150.6
M22	17.56	0.564	154.948	19.112	28.696
M23	184.176	261.876	282.144	304.336	272.8
M24	0	0	84.52	295.868	2.62
M25	182.696	196.652	262.82	301.004	0.008
M26	0.008	0.024	0.012	0.012	0.012
B：Auxiliary Electricity Consumption EG_{AUG} = M7+… + M26	2054.844	3058.568	2984.636	2986.44	2618.928
Net electricity supply A - B = EG_y= EG_{GEN}- EG_{AUG}	27988.996	38707.912	44160.124	38018.76	26727.742

EF (tCO_2e/MWh) in the registered PDD	0.9825	0.9825	0.9825	0.9825	0.9825
Emission reductions (t CO_2 e.)	27499.1886	38030.52354	43387.322	37353.432	26260.007
Total Emission reductions (t CO_2 e.)	172530.4722				

Annex 1: Power Monitoring System Design



Annex2: Details of metering instruments

Meter	Operator	Electronic recording	Manual recording	Reporting	Calibration	Accuracy	Documentation
M1	Project entity	Hourly	Daily	Monthly	Project entity* (Annually)	Accuracy Class 0.2s	Print out of electronic record, paper log and monthly record
M2	Project entity	Hourly	Daily	Monthly	Project entity* (Annually)	Accuracy Class 0.2s	Print out of electronic record, paper log and monthly record
M3	Project entity	Hourly	Daily	Monthly	Power Bureau (Annually)	Accuracy Class 0.2s	Print out of electronic record, paper log and monthly record
…..							
…..							
M26	Project entity	Hourly	Daily	Monthly	Power Bureau (Annually)	Accuracy Class 0.2s	Print out of electronic record, paper log and monthly record

*) “Whereas the staff of the project entity is responsible for organizing the calibration in a timely manner, calibration itself is carried out by a certified third party”.