MONITORING REPORT FORM (F-CDM-MR)
Version 02.0

MONITORING REPORT

Title of the project activity	Southern District Heating Network in Urumqi City
Reference number of the project activity	4295
Version number of the monitoring report	1.0
Completion date of the monitoring report	08/10/2012
Registration date of the project activity	20/06/2011
Monitoring period number and duration of this monitoring period	The second monitoring period First and last days included (01/01/2012-15/04/2012)
Project participant(s)	Urumqi Heating Supply Co., Ltd. Carbon Resource Management Ltd. Carbon Resource Management S.A.
Host Party(ies)	China
Sectoral scope(s) and applied methodology(ies)	Sectoral scope 1 : Energy industries (renewable - / non-renewable sources) Applied methodology: AM0058 “Introduction of a new primary district heating system”, version 03.1
Estimated amount of GHG emission reductions or net anthropogenic GHG removals by sinks for this monitoring period in the registered PDD	924,532tCO_2e
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period	355,197tCO_2e

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

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Southern District Heating Network project (referred to as the project activity hereafter) is located in Urumqi City, Capital of Xinjiang Uygur Autonomous Region. The project activity was constructed and implemented by Urumqi Heating Supply Co., Ltd (referred to as the project owner hereafter). The purpose of the project activity is to supply space heat for 17,490,000 m^2 of buildings. The total heating supply capacity is 1,445 MW. The measures taken by the project activity to reduce greenhouse gas emissions is the introduction of a new primary district heating system to replace the existing isolated small heating systems, improving the thermal energy efficiency for space heating in the target area.

The project activity introduces a new primary district heating system, using heat extracted from the existing Xinjiang Huadian Hongyanchi Power Plant, three existing and one new heat-only boilers (HOB).

Project timeline

Date of CDM registration	20/06/2011
Crediting period	Fixed crediting period
Starting date of crediting period	15/10/2011
End date of crediting period	14/10/2021
Construction start date	01/05/2005
Commissioning start date	15/10/2005

This monitoring period starts from 01/01/2012 and is ended on 15/04/2012, first and last days inclusive.

The total emission reductions achieved in this monitoring period are 355,197tCO_2e.

A.2. Location of project activity

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Host country	People's Republic of China
Province	Xinjiang
City	Urumqi
GPS coordinates	Latitude 43°43'56" to 43°49'31" North Longitude 87°36'20" to 87°39'25" East
Area description	North of Hongshan Road, west of Hetan Road, East of Eastern Cross-border Road, and south of the Xinjiang Huadian Hongyanchi Power Plant railway line.

A.3. Parties and project participant(s)

Party involved ((host) indicates a host Party)	Private and/or public entity(ies) project participants (as applicable)	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
P.R. China (host)	Urumqi Heating Supply Co., Ltd.	No
United Kingdom of Great Britain and Northern Ireland	Carbon Resource Management Ltd.	No
Switzerland	Carbon Resource Management S.A.	No

A.4. Reference of applied methodology

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Methodology:
AM0058 "Introduction of a new primary district heating system", version 03.1

Tools:
"Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion", version 02.

A.5. Crediting period of project activity
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15/10/2011 to 14/10/2021 (fixed)

SECTION B. Implementation of project activity
B.1. Description of implemented registered project activity
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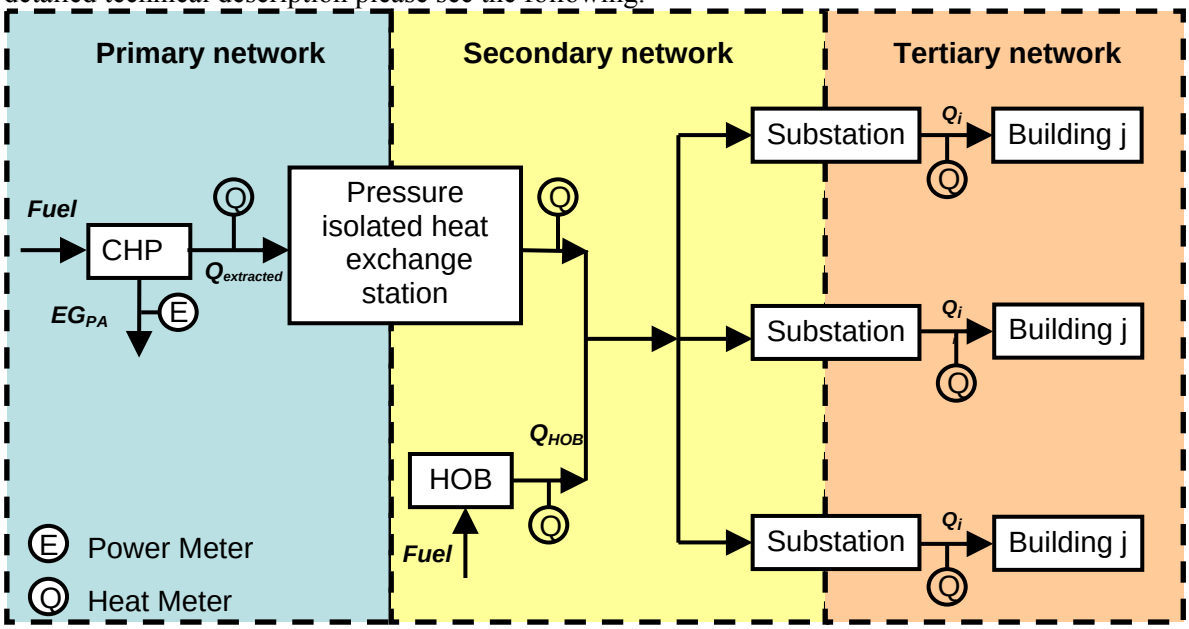
The project activity started commissioning on 15/10/2005. According to the designation, this project consists of one CHP plant working as the main heat resource, four other heat only boiler houses (HOB) working as the supplementary heat resource, one isolated heat exchange station and 193 substations through which the heat from the above heat resources could enter into the heat network and then supplied to the heat users. The CHP plant, isolated heat exchange station and the substations would work through the whole heat supply season (from Oct 15 to next Apr 15) and the HOBs only would work according to the dispatching from the network based on the status of local weather.

Till the end of this monitoring period, the CHP plant, four HOBs, isolated heat exchange station and 174 substations have been built up and could be put into operation. The other 19 substations would be built in the next two years.

Figure below illustrates the structure of the primary heating network and the heating energy flows, and detailed technical description please see the following.



In this project, three-level heating network was employed according to the complex geographical conditions and locations of the heat users.

The project consists of boiler thermal power system, heat supply and distribution network system, heat pipeline network monitoring and control system. The major equipment includes the primary station (primary heat exchange station), the steam extraction device and pipeline, the pressure isolated heat exchange station, substations, frequency variable and speed adjusted monitoring and control system.

1. Primary network

The primary network includes the heat supply source of Xinjiang Huadian Hongyanchi Power Plant Co. Ltd. which is the main heat source working through the whole heat supply season[1]and the pipeline to the pressure isolated heat exchange station. The other four HOBs are the supplementary heat source for the heat network only working in the coolest days such as Jan and Feb.

In the CHP plant, steam is extracted from steam turbine by the steam devices and then the extracted steam is supplied to a primary heat exchange station installed in the CHP plant which is equipped with steam-water heat exchanger, and the heat is supplied to the heat network with heat water through a 3.7 km long DN1200 pipeline.

All the boilers installed in the HOBs are heat water boilers, so the heat from HOBs is supplied to the heat network with heat water through DN 150 up to DN1200 pipeline.

2. Secondary network

The pressure isolated heat exchange station, HOBs and the secondary network system from the pressure isolated heat exchange station to substations compose of the secondary network. Reason for adopting such two level heat supply mode is. DN 150 up to DN1200 pipelines were employed in the secondary network.

To isolate the adverse impact of static water pressure due to high altitude difference (163 m) between the primary heat exchange station of CHP and the end users on the distribution pipeline and substations, the pressure isolated heat exchange station consisting of 12 plated heat exchangers has to be employed. It is installed in such a way so that their altitude difference from the CHP to the pressure isolated heat exchange station is 86 m and the rest altitude difference from the heat exchange station to the substation is 77 m accordingly.

This project is planned to install 193 substations, with total heat supply capacity 1445 MW. Within each substation, heat exchangers would be equipped in parallel. And 174 substations were put into operation till this monitoring period.

3. Tertiary network

The third level network includes pipelines from substation to end users and the monitoring system. The monitoring system is established for the heat pipeline network monitoring and control system, i.e. the main control center (MCC) had been set up at the dispatching center at the Company level; And the sub control center (SCC) was set up at the pressure isolated heat exchange station; While the local control and monitor station (LCM) is set up at the key branch point of the district heating network and at the substations. The computerized heating monitoring and control system (SCADA) was installed to implement on-line heat transmission and regulatory, based on off-door ambient temperature and users demand.

As the heat supply network is hot water system and the limit from the business scope of the project owner, only municipal heat users could be connect to the project and no industrial heat users.

The following lists the char actors of the key equipments

Table B-1: Equipment information of the CHP plant

Parameters	Unit	Indicators
Boiler		
Type	-	WGZ670/13.7-10 DG670/13.7-21
Manufacturer	-	Wuhan Boiler Co.,Ltd Dong Fang Boiler Group Co., Ltd
Number	-	4
Installed capacity	tonne steam/h	670

[1] According to local regulation, the heat supply season of Urumqi City starts from Oct 15th to Apr 15th of next year

Efficiency of heating generation	%	91.2
Load factor	%	68.5
Age	year	5
Lifetime	year	30
Steam Turbines		
Type	-	N(C)200/160－12.75/535/535 C135/N200－12.7/535/535
Manufacturer	-	Harbin Turbine Co., Ltd Beijing Heavy Electric Machinery Works
Number	-	4
Power rating	MW	200
Heat output	tonne steam/h	613
Efficiency of electricity generation	%	43.94
Load factor	%	68.5
Age	year	5
Lifetime	year	30
Generator		
Type	-	QFSN-200-2
Manufacturer	-	Harbin Electric Machinery Co., Ltd Beijing Heavy Electric Machinery Works
Number	-	4
Power rating	MW	200
Rated speed of rotation	r/min	3,000
Efficiency of electricity generation	%	39.27
Load factor	%	68.5
Age	year	5
Lifetime	year	30

Table B-2: Heat only boilers information

Name	**Total heating capacity**	**Type**	**Installed capacity of boiler**	**Number of boilers**	**Manufacture**
Xingfu Road boiler house	174MW	DHL29-1.57/130//70-AIII	29MW	6	Shanghai Si Fang Boiler Works
Guangming Road boiler house	259MW	DHL29-1.57/130//70-AIII	29MW	1	Shanghai Si Fang Boiler Works
		DHL46-1.6/130//70-AIII	46MW	5	
Xinsheng boiler house	72MW	QXL29-1.25/130/70-AII	29MW	2	Shenyang Boiler Works
		DZL14-1.0/130/90-AII	14MW	1	Shanghai Si Fang Boiler Works
Weihuliang boiler house	186MW	DHL70-1.6/130//	70MW	2	Shanghai Si Fang Boiler

		70-AIII			Works
		DHL46-1.6/130// 70-AIII	46MW	1	

Table B-3: Equipment information of pressure isolated heat exchange station

Name	Type	Number	Manufacturer
Plated heat exchanger	S188-IS20-345	12	SONDEX

According to the implemented status, no more than 1% of diesel was consumed as the start-up fuel for this project, so this methodology could be applied to this project.

No events or situations occurred during the monitoring period, which may impact the applicability of the methodology.

B.2. Post registration changes

B.2.1. Temporary deviations from registered monitoring plan or applied methodology

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No deviation applied to this monitoring period.

B.2.2. Corrections

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No corrections applied to this monitoring period.

B.2.3. Permanent changes from registered monitoring plan or applied methodology

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The project is implemented as the revised PDD and no other changes applied to this monitoring period.

B.2.4. Changes to project design of registered project activity

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The project has no other changes.

B.2.5. Changes to start date of crediting period

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N/A

B.2.6. Types of changes specific to afforestation or reforestation project activity

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N/A

SECTION C. Description of monitoring system

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1. Data collection procedure

The following data and parameters are monitored:

i) Coal consumption of the CHP boilers $FC_{PA,CHP,y}$ and those by the four HOB boilers $FC_{PA,HOB,,y}$. The data are monitored continuously and reported monthly at 24:00 of the last day of the month. $FC_{PA,CHP,y}$ and $FC_{PA,HOB}$ are monitored through the use of on site strap balance.

ii) Quantity of heat supply during the project implementation, including the quantity of heat extracted from CHP plant $\boldsymbol{Q}_{extracted}$, the quantity of heat delivered from the HOB boilers $\boldsymbol{Q}_{HOB,y}$

and the quantity of heat supplied by substation *i* $\boldsymbol{Q}_{i,y}$; The heat is monitored continuously by the on site heat meters and reported monthly at 24:00 of the last day of the month by trained staff of Project owner.

iii) Quantity of electricity delivered to the grid during the project implementation from CHP EG_{PAy}. As the CHP plant would import electricity from the grid, the EG_{PA} is calculated as net electricity delivered to the grid by subtracting electricity imported. The electricity is monitored continuously by the power meters installed at the on site substation. The report and invoices are issued monthly by the trained staff of CHP at 24:00 of the last day of the month.

iv) $NCV_{i,y}$, weighted average net calorific value of fuel coal combusted in the CHP plant and the HOB boilers in year y. The value is provided by CHP.

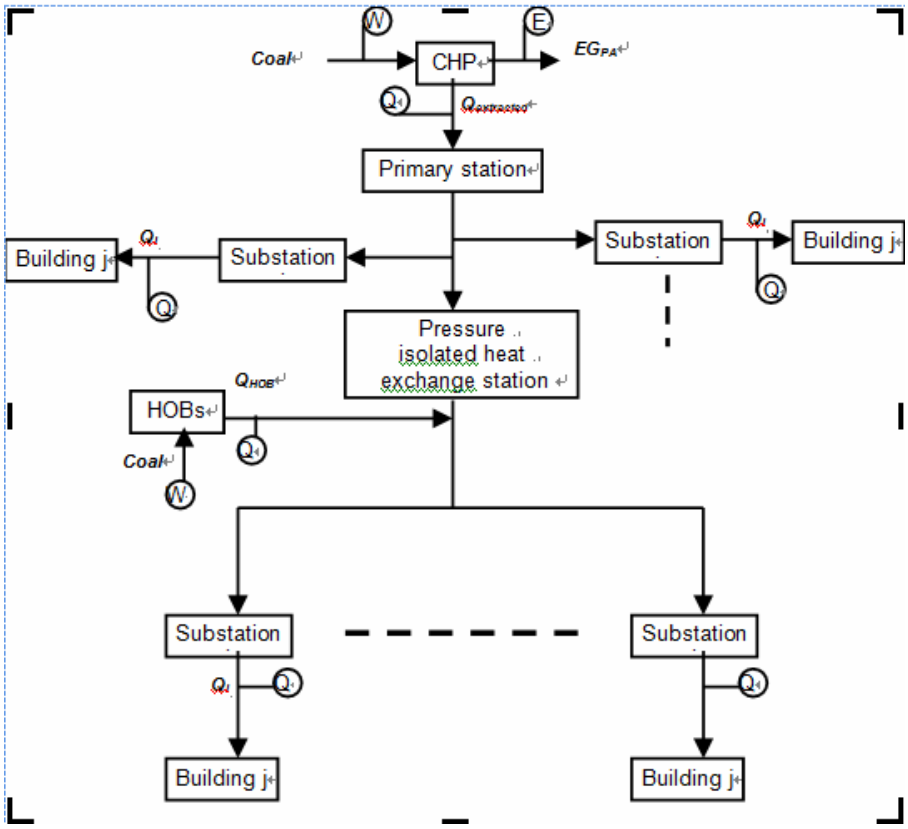
v) $\boldsymbol{A}_{j,i}$, total carpet area of all the building in category j supplied by substation *i,* obtaining from estimations available from actual measurement or local authorities referred to the table1 and table3 of Annex3 in the registered PDD.

vi) Status of the district heating system and capacity: the status are sourced from the Schematic-plan diagrams of the southern district heating system obtained at Urumqi Heating Supply Co., Ltd. and the map of the southern district heating system planning provided in FSR based on the urban construction plan by the responsible Urumqi Urban Planning Bureau.

vii) $EF_{CO2,i,y}$, *i*=coal: this parameter is an IPCC 2006 default value at the upper limit of the uncertainty at a 95% confidence interval of 2006 IPCC Guidelines on National GHG Inventories

viii) $\eta_{BL,\,EL}$ During the monitoring period, CHP would give evidence to show whether there is technical measure was taken to improve the efficiency of the CHP plant, and even since the commissioning of the CHP plant, no such measure was taken. So according to the applied methodology and the registered PDD, the same value of PDD is adopted in the monitoring report.

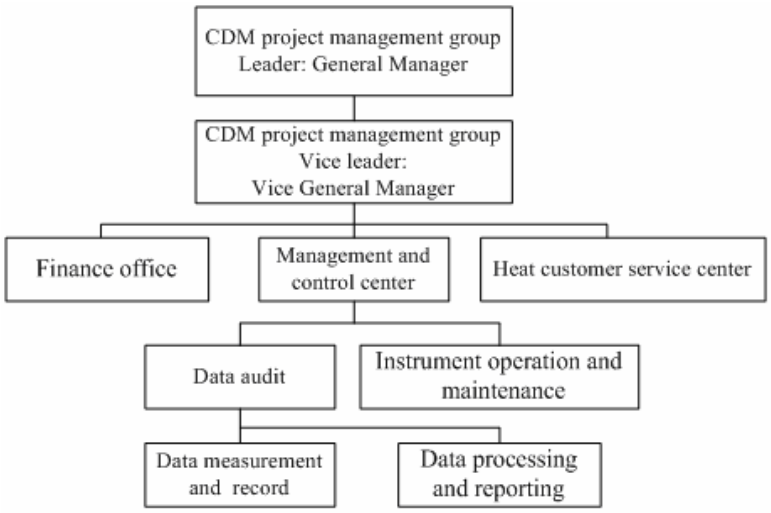
The detailed layout of the installation of the monitoring instruments is as the following figure.



Ⓔpower meterⓆheat meter Ⓦ strap balance

2. Organizational structure, Roles and responsibilities of personnel

Urumqi Heating Supply Co., Ltd. is the project entity, operator, and is also responsible for the monitoring plan and its implementation. A dedicated CDM project management group has been established by the Urumqi Heating Supply Co., Ltd. The institutional structure and function of the group is shown in following figure.



3. QA / QC and emergency procedure

Quality assurance and quality control

The original monitoring data and results of data processing are subject to internal auditing by the staff in the responsible data audit unit. During the QA/QC process those monitoring data are crosschecked with the energy invoices to ensure that the monitored records are accurate and reliable.

Emergency procedure

The management and control centre responsible for monitoring the operation of southern district heating network is located in the main control centre (MCC), where two set of data server are installed, one is main server and another is submissive server. When the main server is out of work, the submissive one is switched to replace the main server.

For the electricity monitoring, when the main electricity meter is found to be in malfunction, the backup electricity meter will take place of it.

For the heat supply monitoring, when the heat relevant parameters exceeds the safety limitation, the monitoring system will alarm with sound and light signals. And the emergency response procedure will start immediately and automatically.

All data collected as part of monitoring should be archived and be kept at least for 2 years after the end of the crediting period.

SECTION D. Data and parameters
D.1. Data and parameters fixed ex ante or at renewal of crediting period

Data/Parameter	$EF_{grid,CM,y}$
Unit	tCO_2/MWh
Description	Emission factor of the electricity grid system
Source of data	PDD
Value(s) applied	0.8712
Purpose of data	Leakage emission calculation
Additional comment	N/A

Data/Parameter	$EF_{BL,EL}$
Unit	tCO_2/MWh
Description	Baseline emission factor for the electricity production
Source of data	Registered PDD
Value(s) applied	0.9369
Purpose of data	Baseline emission calculation
Additional comment	N/A

Data/Parameter	$CAP_{j,i}$
Unit	GJ/year
Description	Nameplate capacity of existing boilers in category j at substation i
Source of data	project FSR
Value(s) applied	Shown in Table 1 of Annex 3 in the registered PDD
Purpose of data	Baseline emission calculation
Additional comment	N/A

Data/Parameter	$EG_{max,hist}$
Unit	MWh
Description	Maximum historic annual amount of electricity generated by the power plant used over the three most recent years prior to the start of implementation of the project activity
Source of data	Historic data of last 3 years (10/2002-09/2005) from the CHP plant
Value(s) applied	4,526,364MWh
Purpose of data	Baseline emission calculation
Additional comment	N/A

Data/Parameter	$EG_{min,hist}$
Unit	MWh
Description	Minimum historic annual amount of electricity generated by the power plant used over the three most recent years prior to the start of implementation of the project activity
Source of data	Historic data of last 3 years (10/2002-09/2005) from the CHP plant
Value(s) applied	1,916,680
Purpose of data	Leakage calculation
Additional comment	N/A

Data/Parameter	$COEF_{BL,HG,j,i}$
Unit	tCO_2/GJ
Description	CO2 emission factor of the fuel coal used in the absence of the project activity in the heat generation system corresponding to substation i
Source of data	IPCC default values as provided in table 1.4 of Chapter 1 of vol. 2 (Energy) of 2006 IPCC Guidelines on National GHG Inventories.
Value(s) applied	Coal: 0.0997
Purpose of data	Baseline emission calculation
Additional comment	Using IPCC default values at the upper limit of the uncertainty at the 95% confidence interval in accordance with the methodology.

Data/Parameter	$\varepsilon_{BL,HG,j,i}$
Unit	%
Description	Efficiency of the heating supply system that would have been used in the absence of the project activity for category *j* and substation *i* Based on historic survey data for 142 small boiler houses and No.140 large heat only boiler house, existing boiler house information are available on FSR Attachment, including historical annual coal consumption, space heating building area, etc. . For the No.144 and No. 145, their actual coal consumption and actual heat supplied were provided by Urumqi Heating Supply Co., Ltd.
Source of data	registered PDD
Value(s) applied	Shown in Table 3 of Annex 3 of the registered PDD
Purpose of data	Baseline emission calculation
Additional comment	N/A

Data/Parameter	$\frac{44}{12} * \frac{EF_{FF,BL,EL}}{NCV_{FF,BL,EL}}$
Unit	t CO_2/GJ
Description	CO_2 emission factor of coal fired in the power plant used prior to the start of the implementation of the project activity
Source of data	default value at the upper limit of the uncertainty at a 95% confidence interval of 2006 IPCC Guidelines on National GHG Inventories
Value(s) applied	0.0997
Purpose of data	Baseline emission calculation
Additional comment	N/A

Data/Parameter	j
Unit	/
Description	Categories grouped by (i) type of buildings (new/existing), (ii) type of technology used and (iii) fuel type used in the absence of the project activity. For each category j, all connected buildings should be clearly identified.
Source of data	Urumqi Heating Supply Co., Ltd. show map
Value(s) applied	3
Purpose of data	N/A
Additional comment	N/A

D.2. Data and parameters monitored

Data/Parameter	$EG_{PA,y}$
Unit	MWh
Description	Actual quantity of electricity supplied to the grid in the year *y*
Measured/Calculated /Default	Measured
Source of data	Electricity meter at the CHP plant.
Value(s) of monitored parameter	Detailed monthly data and calculation is presented in section E1 of the monitoring report.
Monitoring equipment	The detailed equipments information please refer to the annex of the monitoring report.
Measuring/Reading/ Recording frequency	Measuring continuously/Recording monthly
Calculation method (if applicable)	N/A
QA/QC procedures	Cross check with the receipts of sales
Purpose of data	Baseline Emission calculation
Additional comment	The meters accuracy level is 0.2s in the registered PDD. In the project actual implementation stage, the monitoring equipment accuracy level is from 0.5 to 0.2. According to the PPA signed between the CHP plant and the power grid company, the power grid company has the right to possess, operate and maintain the electricity meters, which means that the project owner has no right to settle or change the accuracy of the meters. Furthermore, PPs decided to discount 0.3% (which is the difference between the accuracy level of what in registered PDD and the actual one) of EG_y monitored by electricity meters for conservation.

Data/Parameter	Status of the district heating system and capacity
Unit	Number of substations
Description	Dates of commissioning and status of rated capacity of boilers
Measured/Calculated /Default	Measured
Source of data	Schematic-plan diagrams of the southern district heating system obtained at Urumqi Heating Supply Co., Ltd. and the map of the southern district heating system planning provided in FSR based on the urban construction plan by the responsible Urumqi Urban Planning Bureau
Value(s) of monitored parameter	174
Monitoring equipment	N/A
Measuring/Reading/ Recording frequency	Measuring continuously/Recording monthly
Calculation method (if applicable)	N/A
QA/QC procedures	/
Purpose of data	Baseline Emission calculation
Additional comment	/

Data/Parameter	$Q_{extracted,y}$
Unit	GJ
Description	Quantity of heat extracted from the CHP Plant during the year *y*
Measured/Calculated /Default	Measured
Source of data	Heat meter at supply side of primary heat exchanger
Value(s) of monitored parameter	Detailed monthly data and calculation is presented in section E1 of the monitoring report.
Monitoring equipment	The detailed equipments information please refer to the annex of the monitoring report.
Measuring/Reading/ Recording frequency	Hourly Measuring/Monthly Recording
Calculation method (if applicable)	N/A
QA/QC procedures	The quantity of heat extracted from the CHP Plant during the year y was crosschecked against the meter readings of the point of heat supply as well as heat invoices to Urumqi Heating Supply Co., Ltd to ensure that the heat records are plausible and reliable. Moreover, the corresponding meters have to be subject to regular maintenance in order to ensure measurements with a low degree of uncertainty. Data were stored in excel database.
Purpose of data	Baseline Emission calculation
Additional comment	/

Data/Parameter	$Q_{HOB,y}$
Unit	GJ
Description	Quantity of heat extracted from all heat only boiler houses during the year *y*
Measured/Calculated /Default	Measured
Source of data	Heat meter at supply side of each boiler houses
Value(s) of monitored parameter	Detailed monthly data and calculation is presented in section E1 of the monitoring report.
Monitoring equipment	The detailed equipments information please refer to the annex of the monitoring report.
Measuring/Reading/ Recording frequency	Hourly Measuring/Monthly Recording
Calculation method (if applicable)	N/A
QA/QC procedures	The quantity of heat extracted from the HOBs in year y was crosschecked against the meter readings of the point of heat supply as well as heat invoices to Urumqi Heating Supply Co., Ltd to ensure that the heat records are plausible and reliable. Moreover, the corresponding meters have to be subject to regular maintenance in order to ensure measurements with a low degree of uncertainty. Data were stored in excel database.
Purpose of data	Baseline Emission calculation
Additional comment	/

Data/Parameter	$A_{j,i}$
Unit	m^2
Description	Total carpet area of all the building in category j supplied by substation *i*
Measured/Calculated /Default	Measured
Source of data	Estimations available from approved FSR for existing buildings and new buildings within the Urumqi Southern District Heating Network, which are originally from Urumqi Heating Supply Co., Ltd. and confirmed by Urumqi Urban Planning Bureau
Value(s) of monitored parameter	Total 16,250,100 Detailed data is presented in the calculating spread sheet of the monitoring report.
Monitoring equipment	N/A
Measuring/Reading/ Recording frequency	/
Calculation method (if applicable)	N/A
QA/QC procedures	/
Purpose of data	Baseline Emission calculation
Additional comment	/

Data/Parameter	$Q_{i,y}$
Unit	GJ
Description	Quantity of heat supplied from substation *i* to category *j* buildings
Measured/Calculated /Default	Measured
Source of data	On site measurements of heat meters at substations
Value(s) of monitored parameter	Detailed monthly data and calculation is presented in section E1 of the monitoring report.
Monitoring equipment	The detailed equipments information please refer to the annex of the monitoring report.
Measuring/Reading/ Recording frequency	Hourly Measuring/Monthly Recording
Calculation method (if applicable)	N/A
QA/QC procedures	/
Purpose of data	Baseline Emission calculation
Additional comment	/

Data/Parameter	$FC_{i,j,y}$
Unit	ton
Description	Quantity of fuel coal combusted in process *j* during the year *y*
Measured/Calculated /Default	Measured
Source of data	Onsite measurements of the quantity of coal consumed for the boiler houses in the CHP plant and the four HOB boiler houses
Value(s) of monitored parameter	Detailed monthly data and calculation is presented in section E2 of the monitoring report.
Monitoring equipment	The detailed equipments information please refer to the annex of the monitoring report.
Measuring/Reading/ Recording frequency	Measuring continuously/Recording monthly
Calculation method (if applicable)	N/A
QA/QC procedures	The consistency of metered coal consumption quantities would be cross-checked by a balance that is based on purchased quantities and stock changes.
Purpose of data	Project Emission calculation
Additional comment	/

Data/Parameter	$NCV_{j,y}$, i=coal
Unit	GJ/ton
Description	Weighted average net calorific value of fuel coal consumed in CHP and HOB Boiler House in year *y*
Measured/Calculated /Default	Measured
Source of data	As the values provided by the fuel supplier is unavailable, according t o the registered PDD, the NCV of the coal is monitored by authorized third party in accordance with relevant industrial standard
Value(s) of monitored parameter	Detailed monthly data and calculation is presented in section E2 of the monitoring report.
Monitoring equipment	N/A
Measuring/Reading/ Recording frequency	The $NCV_{i,y}$ is measured for each fuel delivery, from which weighted average annual values could be calculated
Calculation method (if applicable)	N/A
QA/QC procedures	Verify if the value is within the uncertainty range of the IPCC default values as provided in Table 1.2, Vol. 2 of the 2006 IPCC Guidelines. If the value falls below this range collect additional information from the testing laboratory to justify the outcome or conduct additional measurements. The laboratories should have ISO17025 accreditation or justify that they can comply with similar quality standards.
Purpose of data	Project Emission calculation
Additional comment	/

Data/Parameter	$EF_{CO2,i,y}$, i=coal
Unit	tCO_2 /GJ
Description	Weighted average CO_2 emission factor of fuel type in year y
Measured/Calculated /Default	Default
Source of data	IPCC 2006 default value at the upper limit of the uncertainty at a 95% confidence interval of 2006 IPCC Guidelines on National GHG Inventories
Value(s) of monitored parameter	0.0997
Monitoring equipment	N/A
Measuring/Reading/ Recording frequency	/
Calculation method (if applicable)	N/A
QA/QC procedures	/
Purpose of data	Project Emission calculation
Additional comment	/

Data/Parameter	$\eta_{BL,EL}$
Unit	%
Description	Efficiency of the power plant used prior to the start of the implementation of the project activity
Measured/Calculated /Default	Measured
Source of data	CHP plant
Value(s) of monitored parameter	38.31
Monitoring equipment	N/A
Measuring/Reading/ Recording frequency	/
Calculation method (if applicable)	N/A
QA/QC procedures	During this monitoring period, no technical measure was taken to improve the efficiency of the CHP plant, and even since the commissioning of the CHP plant, no such measure was taken. So according to the applied methodology and the registered PDD, the same value of PDD is adopted in the monitoring report.
Purpose of data	Project Emission calculation
Additional comment	/

D.3. Implementation of sampling plan

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N/A

SECTION E. Calculation of emission reductions or GHG removals by sinks

E.1. Calculation of baseline emissions or baseline net GHG removals by sinks

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The baseline emissions in year *y* is calculated as

$BE_y = BE_{HG,y} + BE_{EL,y}$

Where:

BE_y Baseline emission during the year y, (tCO_2e);

$BE_{HG,y}$ Baseline emissions from the generation of heat during the year y (tCO_2e);

$BE_{EL,y}$ Baseline emissions from the generation of electricity during the year y (tCO_2e).

For the estimation of baseline emissions from the generation of heat the following stepwise approach is applied.

Step 1: Baseline emissions from heat generation

Baseline emissions from heat generation are calculated as follows:

$$BE_{HG,y} = \sum_i \sum_{j\in 1} Q_{j,i,y} \times EF_{BL,HG,j,i} + \sum_i \sum_{j\in 2} Q_{j,i,y} \times EF_{BL,HG,j,i} + \sum_i \sum_{j\in 3} Q_{j,i,y} \times EF_{BL,HG,j,i}$$

Where:

$BE_{HG,y}$ Baseline emissions from the generation of heat during the year *y* (tCO_2e);

$Q_{j,i,y}$ Quantity of heat supplied from substation *i* to buildings in category *j* in the year *y* monitored by the on site heat meters(GJ);

$EF_{BL,HG,j,i}$ CO_2 emission factor for heat generation for building category *j* connected to substation *i* in the absence of the project activity (tCO_2/GJ);

j 3 categories included in the project boundary defined as combination of building type

Buildings of category 1: Buildings in a part of the area supplied by a sub-station that were connected to an existing isolated heat distribution network before the start of the project activity, treated as exist buildings.
Buildings of category 2: Recently constructed buildings that are connected to sub-stations that replace old boiler houses, treated as exist buildings
Buildings of category 3: Buildings in a part of the area supplied by a sub-station in an area which prior to project activity did not have any heat distribution network, treated as new buildings.

i All substations included in the project boundary, the detailed information could be found in the calculation spreadsheet.

For the cases where the category j consists of existing buildings, as per the definition provided earlier in the procedure for the identification of the baseline scenario, the quantity of heat supplied to this category from substation i should be estimated as follows:

$$Q_{i,y} = min\ \{Q_{\text{inst,cap,j,i}}, Q_{\text{i,y}}\}$$

Where:

$Q_{\text{inst,cap,j,i}}$ Maximum quantity of heat that could have been supplied per year by existing boiler(s) supplying to category j building within the area supplied by substation *i* in the absence of the project activity, (GJ), where '*j*' belongs to set of all categories of 'existing buildings' within the substation i.

The maximum quantity of heat $Q_{\text{inst,cap,j,i}}$ is determined by multiplying a nameplate capacity value $CAP_{\text{j,i}}$ of the boiler supplying to building type j at substation i with *T*, the number of operational hours per year, during this monitoring period, T=106 days*24 hours/day=2,544hours.
$Q_{\text{inst,cap,j,i}} = CAP_{\text{j,i}} \times T$.

The baseline emissions from heat generation are summarised as follows, with a detailed list of each building and substation provided in the spreadsheet:

The total baseline emissions from the heat generation are 820,644tCO_2.

Step 2 Baseline emissions from the power generation

Baseline emissions from the power generation are calculated as follows:
$BE_{EL,y} = min\{EG_{max,hist}\ ;\ EG_{PA,y}\} \times EF_{BL,EL}$
Where:
$BE_{EL,y}$ is the Baseline emissions from the generation of electricity during the year y, (tCO_2e);
$EF_{BL,EL}$ is the Baseline emission factor for the electricity production, (tCO_2/MWh);
$EG_{PA,y}$ is the Monitored actual quantity of electricity supplied to the grid in the year y (MWh);
$EG_{max,hist}$ is the Maximum historic annual amount of electricity production over the three most recent years prior to the start of the implementation of the project activity, (MWh).

$EG_{PA,y}$ (MWh)				
	Values from the meter readings	deducted values from meter readings	Values from the sales receipts	Values applied for calculation
Period	A	B=A*(1-(0.5%-0.2%))	C	D=Min(B,C)
01/01/2012 to 31/01/2012	404178.720	402966.184	404178.720	402966.184
01/02/2012 to 29/02/2012	334366.032	333362.934	334366.032	333362.934
01/03/2012 to 31/03/2012	346794.096	345753.714	346794.096	345753.714
01/04/2012 to 15/04/2012	108108.528	107784.202	108108.528	107784.202
Total	1193447.376	1189867.034	1193447.376	1189867.034

Note: There are totally 14 electricity meters were installed by the power grid company to monitor the electricity exchanges between the CHP and the power grid. Some of these meters' accuracies are in accordance with the monitoring plan and some not, but all the meters meet the requirements of PPA and local industrial standards. Both the installation and operations on the electricity meters are not under the

control of PPs. During this monitoring period, all the meters were calibrated in a right manner and to be conservative, the difference between the accuracy level of the installed monitoring equipment and the accuracy prescribed by the applied methodology and/or the registered monitoring plan is deducted from the measured value.

The length of this monitoring period is 106days, so during this monitoring period, $EG_{max,\ hist}$ should be 106/365 of the yearly $EG_{max,hist}$ in PDD, $EG_{max,hist}$=106/365*4,526,364= 1,310,914.164 MWh. According to the registered PDD and the applied methodology, the minimum of the monitored value and should be applied in the calculation. The monitored valued in this monitoring period is 1,189,867.034 MWh, thus the monitored actual quantity of electricity supplied is taken.

$EF_{BL,\ EL}$ is determined ex-ante in the PDD as 0.9369tCO_2/MWh.
During this monitoring period, the Baseline emissions from the power generation are therefore calculated as $BE_{EL,y} = EG_{PA\ ,\ y} \times EF_{BL,\ EL}$ = 1,189,867.034 × 0.9369 = 1,114,786 tCO_2.

As the calculation above, the baseline emission (BE_y) equals to the sum of the baseline emission from electricity supply ($BE_{EL,y}$) and the baseline emission from heat supply ($BE_{HG,y}$), BE_y= $BE_{HG,y}$+$BE_{EL,y}$, so the baseline emission during this monitoring period is 1,935,430 tCO_2e.

E.2. Calculation of project emissions or actual net GHG removals by sinks
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According to the applied methodology and the registered PDD, project emissions are the sum of the emissions from onsite fossil fuel.

Project emissions (PE_y) comprise:

- CO_2 emissions from fuel coal combustion associated with the production of heat and electricity in the CHP plant; and
- CO_2 emissions from fuel coal combustion in heat-only boilers.

These project emissions are calculated by using following formula based on the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion" (Version 02) as follows:

$$PE_{\mathrm{y}} = \sum_{j} PE_{FC,j,y}$$

$$PE_{FC,j,y} = \sum_{i} FC_{i,j,y} \times COEF_{i,y}$$

$COEF_{i,y}$, is calculated as follows:

$$COEF_{\mathrm{i,y}} = NCV_{\mathrm{i,y}} \times EF_{CO2,\mathrm{i,y}}$$

Here:
$EF_{CO2,i,y}$ is 0.0997 tCO_2/GJ for coal, based on 2006 IPCC default value;
The value of NCV for coal is monitored by PP and calculated as follows:

CHP

Period		$FC_{coal,y}$(tcoal)	$NCV_{i,y}$ (GJ/tcoal)
01/01/2012 to 31/01/2012	first delivery	60,000.00	16.70
	second delivery	60,000.00	16.50
	third delivery	60,000.00	16.60
	fourth delivery	60,000.00	16.80
	fifth delivery	55,888.25	16.80
	total	295,888.25	16.68
01/02/2012 to 29/02/2012	first delivery	60,000.00	16.70
	second delivery	60,000.00	16.50
	third delivery	60,000.00	16.60
	fourth delivery	60,000.00	16.80
	fifth delivery	29,204.57	16.80
	total	269,204.57	16.67
01/03/2012 to 31/03/2012	first delivery	60,000.00	16.60
	second delivery	60,000.00	16.50
	third delivery	60,000.00	16.60
	fourth delivery	60,000.00	16.70
	fifth delivery	356.90	16.60
	total	240,356.90	16.60
01/04/2012 to 15/04/2012	first delivery	60,000.00	16.70
	second delivery	11,409.41	16.60
	total	71,409.41	16.68
Total		876,859.13	15.10

HOB1

Period	$FC_{coal,y}$(tcoal/y)	$NCV_{i,y}$ (GJ/tcoal)
01/01/2012 to 31/01/2012	11,404.00	16.60
01/02/2012 to 29/02/2012	12,434.00	16.60
01/03/2012 to 31/03/2012	0.00	0.00
01/04/2012 to 15/04/2012	0.00	0.00
Total	23,838.00	16.6

HOB2

Period	$FC_{coal,y}$(tcoal/y)	$NCV_{i,y}$ (GJ/tcoal)
01/01/2012 to 31/01/2012	11,822.00	16.70
01/02/2012 to 29/02/2012	12,892.00	16.70
01/03/2012 to 31/03/2012	0.00	0.00
01/04/2012 to 15/04/2012	0.00	0.00
Total	24,714.00	16.7

HOB3

Period	$FC_{coal,y}$(tcoal/y)	$NCV_{i,y}$ (GJ/tcoal)
01/01/2012 to 31/01/2012	0.00	0.00
01/02/2012 to 29/02/2012	0.00	0.00
01/03/2012 to 31/03/2012	0.00	0.00
01/04/2012 to 15/04/2012	0.00	0.00
Total	0.00	0

HOB4

Period	$FC_{coal,y}$(tcoal/y)	$NCV_{i,y}$ (GJ/tcoal)
01/01/2012 to 31/01/2012	12,426.00	16.50
01/02/2012 to 29/02/2012	11,441.00	16.50
01/03/2012 to 31/03/2012	2,716.00	16.50
01/04/2012 to 15/04/2012	0.00	0.00
Total	26,583.00	16.5

So the project emission from coal consumption is calculated as:

CHP

Period	$FC_{coal,y}$(tcoal)	$NCV_{i,y}$ (GJ/tcoal)	$EF_{CO2,i,y}$ (tCO_2/GJ)	$COEF_{Coal,y}$ (tCO_2/tcoal)	PE_y (tCO_2)
01/01/2012 to 31/01/2012	295,888.25	16.68	0.0997	1.66	492,011
01/02/2012 to 29/02/2012	269,204.57	16.67	0.0997	1.66	447,317
01/03/2012 to 31/03/2012	240,356.90	16.60	0.0997	1.66	397,795
01/04/2012 to 15/04/2012	71,409.41	16.68	0.0997	1.66	118,782
Total	876,859.13				1,455,905

HOB1: Xingfu Road

Period	$FC_{coal,y}$(tcoal/y)	$NCV_{i,y}$ (GJ/tcoal)	$EF_{CO2,i,y}$ (tCO_2/GJ)	$COEF_{Coal,y}$ (tCO_2/tcoal)	PE_y (tCO_2)
01/01/2012 to 31/01/2012	11,404.00	16.60	0.0997	1.66	18873
01/02/2012 to 29/02/2012	12,434.00	16.60	0.0997	1.66	20578
01/03/2012 to 31/03/2012	0.00	0.00	0.0997	0.00	0
01/04/2012 to 15/04/2012	0.00	0.00	0.0997	0.00	0
Total	23,838.00				39451

HOB2: Guangming Road

Period	$FC_{coal,y}$(tcoal/y)	$NCV_{i,y}$ (GJ/tcoal)	$EF_{CO2,i,y}$ (tCO_2/GJ)	$COEF_{Coal,y}$ (tCO_2/tcoal)	PE_y (tCO_2)
01/01/2012 to 31/01/2012	11,822.00	16.70	0.0997	1.66	19683
01/02/2012 to 29/02/2012	12,892.00	16.70	0.0997	1.66	21465
01/03/2012 to 31/03/2012	0.00	0.00	0.0997	0.00	0
01/04/2012 to 15/04/2012	0.00	0.00	0.0997	0.00	0
Total	24,714.00				41148

HOB3: Xinsheng

Period	$FC_{coal,y}$(tcoal/y)	$NCV_{i,y}$ (GJ/tcoal)	$EF_{CO2,i,y}$ (tCO_2/GJ)	$COEF_{Coal,y}$ (tCO_2/tcoal)	PE_y (tCO_2)
01/01/2012 to 31/01/2012	0.00	0.00	0.0997	0.00	0
01/02/2012 to 29/02/2012	0.00	0.00	0.0997	0.00	0
01/03/2012 to 31/03/2012	0.00	0.00	0.0997	0.00	0
01/04/2012 to 15/04/2012	0.00	0.00	0.0997	0.00	0
Total	0.00				0

HOB4: Weihuliang

Period	$FC_{coal,y}$(tcoal/y)	$NCV_{i,y}$ (GJ/tcoal)	$EF_{CO2,i,y}$ (tCO_2/GJ)	$COEF_{Coal,y}$ (tCO_2/tcoal)	PE_y (tCO_2)
01/01/2012 to 31/01/2012	12,426.00	16.50	0.0997	1.65	20441
01/02/2012 to 29/02/2012	11,441.00	16.50	0.0997	1.65	18821
01/03/2012 to 31/03/2012	2,716.00	16.50	0.0997	1.65	4467
01/04/2012 to 15/04/2012	0.00	0.00	0.0997	0.00	0
Total	26,583.00				43729

The total project emissions can now be calculated as the aggregate of the above, which is 1,580,233 tCO_2e.

E.3. Calculation of leakage

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According to the methodology and the registered PDD, only coal is used in both project activity and the baseline scenario without fuel switch, so the leakage effect from fuel switch is not required for project activity, thus $LE_y=LE_{EL,y}$.

If $EG_{PA,y} < EG_{\min,hist}$

And

$EF_{grid} > EF_{BL,EL}$

Then

$$LE_{EL,y} = \left(EG_{\min,hist} - EG_{PA,y}\right) \times \left(EF_{grid} - EF_{BL,EL}\right)$$

Where:

$EG_{min,hist}$ = Minimum historic annual amount of electricity supplied to the grid over the three most recent years prior to the start of the project activity, the value is 1,916,680, (MWh)

$EG_{PA,y}$ = Monitored actual quantity of electricity supplied by the project activity to the grid in the year *y* (MWh)

EF_{grid} = Emission factor of the electricity grid system (tCO_2/MWh)

$EF_{BL,EL}$ = Baseline emission factor for the electricity production, as calculated in the baseline emissions section, the value is 0.9369 (tCO_2/MWh)

During this monitoring period, the monitored electricity supplied to the grid $EG_{PA,y}$ is 1,189,867.034 MWh, and the historical minimum generation ($EG_{\min,hist}$) during this monitoring period is 1,916,680*106/365=556,624.876MWh (the length of this monitoring period is 106 days). As the historical minimum generation is less than the actually supplied electricity, therefore, according to the AM0058 (version 03.1), the leakage is considered as zero.

E.4. Summary of calculation of emission reductions or net anthropogenic GHG removals by sinks

Time Period	Baseline emissions or baseline net GHG removals by sinks (tCO_2e)	Project emissions or actual net GHG removals by sinks (tCO_{2e})	Leakage (tCO_2e)	Emission reductions or net anthropogenic GHG removals by sinks (tCO_2e)
Total	1,935,430	1,580,233	0	355,197

E.5. Comparison of actual emission reductions or net anthropogenic GHG removals by sinks with estimates in registered PDD

Item	Values estimated in ex-ante calculation of registered PDD	Actual values achieved during this monitoring period
Emission reductions or GHG removals by sinks (tCO_2e)	**924,532**	**355,197**

The estimated annual volume of emission reduction in 2012 of the registered PDD is 1,129,320tCO_2e. If the project wasn't a district heating project and had no heat supply season, the estimated emission reduction during this monitoring period (106 days) should be 327,966tCO_2e (327,966=106*1,129,320/365), which would be lower than the actual values achieved during this monitoring period. But as a district heating project, the emission reduction of this project could only generated during the heat supply season. According to the registered PDD, the annual baseline emissions from the heat generation in 2012 are 2,021,161tCO_2e, generated within 181 days (according to local regulation and the FSR, the heat supply season is 181 days), so the average daily baseline emissions from the heat generation should be about 11,166tCO_2e (11,166=2,021,161/181). The annual baseline emissions from the power generation in 2012 are 4,240,675tCO_2e, generated in the whole year, so the daily baseline emissions from the heat generation should be about 11,618 tCO_2e (11,618=4,240,675/365).

The annual project emissions in 2012 are 5,132,516tCO_2e, generated in the whole year, so the daily project emissions are 14,062tCO_2e (14,062=5,132,516/365). As the leakage is zero, the daily emission

reductions should be about 8,722tCO_2e (8,722=11,166+11,618-14,062-0). According to the length of this monitoring period (106days), the estimated emission reductions during this monitoring period should be 924,532tCO_2e (924,532=8,376*78).

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

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The actual emission reductions during this monitoring period are 355,197tCO_2e, which is lower than the estimation in the registered PDD.

Annex 1 Energy Balance Analysis of the project

	(Unit:GJ)
$Q_{CHP,all}$	14,602,880.12
E_{CHP}	4,283,521.32
$Q_{extracted,y}$	5,218,209.00
$Q_{HOB,1,y}$	192,076.00
$Q_{HOB,2,y}$	205,275.00
$Q_{HOB,3,y}$	0.00
$Q_{HOB,4,y}$	223,898.40
Q_{out}	5,254,122.18
Efficiency of the power plant	29.33%
Heat Balance	89.98%
Energy Balance	65.07%

$Q_{CHP,all}$ is the input energy in CHP generated by the consumed coal in this monitoring period, Calculated by the quantities of consumed coal multiplied with the NCV of the coal.

E_{CHP} is the electricity energy generated by the CHP in this monitoring period, Calculated by the quantity of electricity supplied to the grid by CHP ($EG_{PA,y}$, MWh) multiplied with 3.6.

$Q_{extracted,y}$ is the heat extracted from the CHP to this project in this monitoring period.

$Q_{HOB,i,y}$ is the heat supplied by the HOB_i to this project in this monitoring period.

Q_{out} is the heat supplied from the substations to heat users in this monitoring period, sum of $Q_{i,y}$

Heat balance is the cross-check between Q_{out} and the sum of $Q_{extracted,y}$ and $Q_{HOB,i,y}$, the value means the percentage occupied by Q_{out} of the sum of heat source.

Energy balance means the percentage occupied by energy generated in CHP including $Q_{extracted,y}$ and E_{CHP} of the sum of input energy $Q_{CHP,all}$.

Annex 2 The monitoring equipments information

1. $EG_{PA,y}$

Power Lines		Type	SN	accuracy class	Calibration	Date of Calibration	Validity
ErBa	main	Digital Power meter	200111z11u0076	0.5	Annually	22/09/2011	21/09/2012
	backup	Digital Power meter	200010004u0051	0.5	Annually	22/09/2011	21/09/2012
ErMan	main	Digital Power meter	20070772010048	0.2s	Annually	22/09/2011	21/09/2012
	backup	Digital Power meter	20070772010047	0.2s	Annually	22/09/2011	21/09/2012
ErDong	main	Digital Power meter	09090167290037	0.2s	Annually	22/09/2011	21/09/2012
	backup	Digital Power meter	09090167290039	0.2s	Annually	22/09/2011	21/09/2012
ErDa	main	Digital Power meter	10030277540026	0.2s	Annually	22/09/2011	21/09/2012
	backup	Digital Power meter	10030277540030	0.2s	Annually	22/09/2011	21/09/2012
ErGong	main	Digital Power meter	200409179U0207	0.5	Annually	22/09/2011	21/09/2012
	backup	Digital Power meter	200409179U0208	0.5	Annually	22/09/2011	21/09/2012
ErChi	main	Digital Power meter	20070624010096	0.5s	Annually	22/09/2011	21/09/2012
	backup	Digital Power meter	20070624010099	0.5s	Annually	22/09/2011	21/09/2012
Pang	main	Digital Power meter	200010004U0074	0.5	Annually	29/09/2011	28/09/2012
	backup	Digital Power meter	200111Z11U0006	0.5	Annually	29/09/2011	28/09/2012

2. $Q_{extracted,y}$

Type	SN	accuracy class	Calibration frequency	Date of Calibration	Validity
Digital heat meter	191001y457	0.50%	3 years	11/10/2011	10/10/2014

3. $Q_{HOB,y}$

Location	Type	SN	accuracy class	Calibration frequency	Date of Calibration	Validity
Guangming Road	Digital heat meter	5302497	0.50%	3 years	13/10/2011	12/10/2014
	Digital heat meter	5302495	0.50%	3 years	13/10/2011	12/10/2014
	Digital heat meter	6589909	0.50%	3 years	13/10/2011	12/10/2014
Xingfu Road	Digital heat meter	5302494	0.50%	3 years	13/10/2011	12/10/2014
	Digital heat meter	6589907	0.50%	3 years	13/10/2011	12/10/2014
	Digital heat meter	6589908	0.50%	3 years	13/10/2011	12/10/2014
	Digital heat meter	6362215	0.50%	3 years	13/10/2011	12/10/2014
Xinsheng	Digital heat meter	6807342	0.50%	3 years	13/10/2011	12/10/2014
Weihuliang	Digital heat meter	5302496	0.50%	3 years	13/10/2011	12/10/2014

4. $Q_{i,y}$

Location	Type	SN	accuracy class	Calibration frequency	Date of Calibration	Validity
1	Digital heat meter	6807417	0.50%	3 years	13/10/2011	12/10/2014
2	Digital heat meter	6807378	0.50%	3 years	13/10/2011	12/10/2014
3	Digital heat meter	6807439	0.50%	3 years	13/10/2011	12/10/2014
4	Digital heat meter	6553495	0.50%	3 years	13/10/2011	12/10/2014
5	Digital heat meter	6589903	0.50%	3 years	13/10/2011	12/10/2014
6	Digital heat meter	6807377	0.50%	3 years	13/10/2011	12/10/2014
7	Digital heat meter	6674650	0.50%	3 years	13/10/2011	12/10/2014
8	Digital heat meter	984001Y410	0.50%	3 years	13/10/2011	12/10/2014
9	Digital heat meter	MTH-6	0.50%	3 years	13/10/2011	12/10/2014
10	Digital heat meter	6807438	0.50%	3 years	13/10/2011	12/10/2014
11	Digital heat meter	6807330	0.50%	3 years	13/10/2011	12/10/2014
12	Digital heat meter	6988173	0.50%	3 years	13/10/2011	12/10/2014
13	Digital heat meter	6807362	0.50%	3 years	13/10/2011	12/10/2014
14	Digital heat meter	6807346	0.50%	3 years	13/10/2011	12/10/2014
15	Digital heat meter	6988172	0.50%	3 years	13/10/2011	12/10/2014
16	Digital heat meter	6807387	0.50%	3 years	13/10/2011	12/10/2014
17	Digital heat meter	6807385	0.50%	3 years	13/10/2011	12/10/2014
18	Digital heat meter	3020145	0.50%	3 years	13/10/2011	12/10/2014
19	Digital heat meter	6807422	0.50%	3 years	13/10/2011	12/10/2014
20	Digital heat meter	6807381	0.50%	3 years	13/10/2011	12/10/2014
21	Digital heat meter	6807413	0.50%	3 years	13/10/2011	12/10/2014
22	Digital heat meter	6807341	0.50%	3 years	13/10/2011	12/10/2014
23	Digital heat meter	6807332	0.50%	3 years	13/10/2011	12/10/2014
24	Digital heat meter	6988169	0.50%	3 years	13/10/2011	12/10/2014
25	Digital heat meter	6569903	0.50%	3 years	13/10/2011	12/10/2014
26	Digital heat meter	6807336	0.50%	3 years	13/10/2011	12/10/2014
27	Digital heat meter	6988140	0.50%	3 years	13/10/2011	12/10/2014
28	Digital heat meter	6807436	0.50%	3 years	13/10/2011	12/10/2014
29	Digital heat meter	6807379	0.50%	3 years	13/10/2011	12/10/2014
30	Digital heat meter	6807447	0.50%	3 years	13/10/2011	12/10/2014

31	Digital heat meter	6807453	0.50%	3 years	13/10/2011	12/10/2014
32	Digital heat meter	6807366	0.50%	3 years	13/10/2011	12/10/2014
33	Digital heat meter	6807345	0.50%	3 years	13/10/2011	12/10/2014
34	Digital heat meter	6807412	0.50%	3 years	13/10/2011	12/10/2014
35	Digital heat meter	6807454	0.50%	3 years	13/10/2011	12/10/2014
36	Digital heat meter	6807434	0.50%	3 years	13/10/2011	12/10/2014
37	Digital heat meter	6807440	0.50%	3 years	13/10/2011	12/10/2014
38	Digital heat meter	6807449	0.50%	3 years	13/10/2011	12/10/2014
39	Digital heat meter	6807420	0.50%	3 years	13/10/2011	12/10/2014
40	Digital heat meter	6988148	0.50%	3 years	13/10/2011	12/10/2014
41	Digital heat meter	6807337	0.50%	3 years	13/10/2011	12/10/2014
42	Digital heat meter	6807343	0.50%	3 years	13/10/2011	12/10/2014
43	Digital heat meter	ZR-E111	0.50%	3 years	13/10/2011	12/10/2014
44	Digital heat meter	6988142	0.50%	3 years	13/10/2011	12/10/2014
45	Digital heat meter	6674651	0.50%	3 years	13/10/2011	12/10/2014
46	Digital heat meter	6807423	0.50%	3 years	13/10/2011	12/10/2014
47	Digital heat meter	6807363	0.50%	3 years	13/10/2011	12/10/2014
48	Digital heat meter	6807370	0.50%	3 years	13/10/2011	12/10/2014
49	Digital heat meter	6485652	0.50%	3 years	13/10/2011	12/10/2014
50	Digital heat meter	6807424	0.50%	3 years	13/10/2011	12/10/2014
51	Digital heat meter	6807364	0.50%	3 years	13/10/2011	12/10/2014
52	Digital heat meter	6674644	0.50%	3 years	13/10/2011	12/10/2014
53	Digital heat meter	6988154	0.50%	3 years	13/10/2011	12/10/2014
54	Digital heat meter	6674652	0.50%	3 years	13/10/2011	12/10/2014
55	Digital heat meter	6807448	0.50%	3 years	13/10/2011	12/10/2014
56	Digital heat meter	6807344	0.50%	3 years	13/10/2011	12/10/2014
57	Digital heat meter	6553497	0.50%	3 years	13/10/2011	12/10/2014
58	Digital heat meter	6589905	0.50%	3 years	13/10/2011	12/10/2014
59	Digital heat meter	6674645	0.50%	3 years	13/10/2011	12/10/2014
60	Digital heat meter	6807384	0.50%	3 years	13/10/2011	12/10/2014

61	Digital heat meter	6485650	0.50%	3 years	13/10/2011	12/10/2014
62	Digital heat meter	6485645	0.50%	3 years	13/10/2011	12/10/2014
63	Digital heat meter	6674648	0.50%	3 years	13/10/2011	12/10/2014
64	Digital heat meter	6485621	0.50%	3 years	13/10/2011	12/10/2014
65	Digital heat meter	6485648	0.50%	3 years	13/10/2011	12/10/2014
66	Digital heat meter	6485654	0.50%	3 years	13/10/2011	12/10/2014
67	Digital heat meter	6988152	0.50%	3 years	13/10/2011	12/10/2014
68	Digital heat meter	6485640	0.50%	3 years	13/10/2011	12/10/2014
69	Digital heat meter	6485607	0.50%	3 years	13/10/2011	12/10/2014
70	Digital heat meter	6485623	0.50%	3 years	13/10/2011	12/10/2014
71	Digital heat meter	6485617	0.50%	3 years	13/10/2011	12/10/2014
72	Digital heat meter	6485622	0.50%	3 years	13/10/2011	12/10/2014
73	Digital heat meter	6485611	0.50%	3 years	13/10/2011	12/10/2014
74	Digital heat meter	6674653	0.50%	3 years	13/10/2011	12/10/2014
75	Digital heat meter	6485614	0.50%	3 years	13/10/2011	12/10/2014
76	Digital heat meter	6485613	0.50%	3 years	13/10/2011	12/10/2014
77	Digital heat meter	6807430	0.50%	3 years	13/10/2011	12/10/2014
78	Digital heat meter	6807435	0.50%	3 years	13/10/2011	12/10/2014
79	Digital heat meter	6485639	0.50%	3 years	13/10/2011	12/10/2014
80	Digital heat meter	6485620	0.50%	3 years	13/10/2011	12/10/2014
81	Digital heat meter	6485642	0.50%	3 years	13/10/2011	12/10/2014
82	Digital heat meter	6485634	0.50%	3 years	13/10/2011	12/10/2014
83	Digital heat meter	6807443	0.50%	3 years	13/10/2011	12/10/2014
84	Digital heat meter	6988139	0.50%	3 years	13/10/2011	12/10/2014
85	Digital heat meter	6485657	0.50%	3 years	13/10/2011	12/10/2014
86	Digital heat meter	6485638	0.50%	3 years	13/10/2011	12/10/2014
87	Digital heat meter	6485641	0.50%	3 years	13/10/2011	12/10/2014
88	Digital heat meter	6807340	0.50%	3 years	13/10/2011	12/10/2014
89	Digital heat meter	6485616	0.50%	3 years	13/10/2011	12/10/2014
90	Digital heat meter	6485632	0.50%	3 years	13/10/2011	12/10/2014

91	Digital heat meter	6485612	0.50%	3 years	13/10/2011	12/10/2014
92	Digital heat meter	6807431	0.50%	3 years	13/10/2011	12/10/2014
93	Digital heat meter	6485615	0.50%	3 years	13/10/2011	12/10/2014
94	Digital heat meter	6807386	0.50%	3 years	13/10/2011	12/10/2014
95	Digital heat meter	6485628	0.50%	3 years	13/10/2011	12/10/2014
96	Digital heat meter	6485646	0.50%	3 years	13/10/2011	12/10/2014
97	Digital heat meter	6485636	0.50%	3 years	13/10/2011	12/10/2014
98	Digital heat meter	6485656	0.50%	3 years	13/10/2011	12/10/2014
99	Digital heat meter	6485619	0.50%	3 years	13/10/2011	12/10/2014
100	Digital heat meter	6807367	0.50%	3 years	13/10/2011	12/10/2014
101	Digital heat meter	6485631	0.50%	3 years	13/10/2011	12/10/2014
102	Digital heat meter	6988155	0.50%	3 years	13/10/2011	12/10/2014
103	Digital heat meter	6485644	0.50%	3 years	13/10/2011	12/10/2014
104	Digital heat meter	6485608	0.50%	3 years	13/10/2011	12/10/2014
105	Digital heat meter	6807339	0.50%	3 years	13/10/2011	12/10/2014
106	Digital heat meter	6807383	0.50%	3 years	13/10/2011	12/10/2014
107	Digital heat meter	6485643	0.50%	3 years	13/10/2011	12/10/2014
108	Digital heat meter	6485565	0.50%	3 years	13/10/2011	12/10/2014
109	Digital heat meter	6826894	0.50%	3 years	13/10/2011	12/10/2014
110	Digital heat meter	6485624	0.50%	3 years	13/10/2011	12/10/2014
111	Digital heat meter	6485610	0.50%	3 years	13/10/2011	12/10/2014
112	Digital heat meter	6807334	0.50%	3 years	13/10/2011	12/10/2014
113	Digital heat meter	6807348	0.50%	3 years	13/10/2011	12/10/2014
114	Digital heat meter	6826891	0.50%	3 years	13/10/2011	12/10/2014
115	Digital heat meter	6485605	0.50%	3 years	13/10/2011	12/10/2014
116	Digital heat meter	6485626	0.50%	3 years	13/10/2011	12/10/2014
117	Digital heat meter	6826895	0.50%	3 years	13/10/2011	12/10/2014
118	Digital heat meter	6485627	0.50%	3 years	13/10/2011	12/10/2014
119	Digital heat meter	6826948	0.50%	3 years	13/10/2011	12/10/2014
120	Digital heat meter	6485651	0.50%	3 years	13/10/2011	12/10/2014

121	Digital heat meter	6485655	0.50%	3 years	13/10/2011	12/10/2014
122	Digital heat meter	6826951	0.50%	3 years	13/10/2011	12/10/2014
123	Digital heat meter	6485653	0.50%	3 years	13/10/2011	12/10/2014
124	Digital heat meter	6807347	0.50%	3 years	13/10/2011	12/10/2014
125	Digital heat meter	6826949	0.50%	3 years	13/10/2011	12/10/2014
126	Digital heat meter	6826383	0.50%	3 years	13/10/2011	12/10/2014
127	Digital heat meter	6988144	0.50%	3 years	13/10/2011	12/10/2014
128	Digital heat meter	6988170	0.50%	3 years	13/10/2011	12/10/2014
129	Digital heat meter	6674655	0.50%	3 years	13/10/2011	12/10/2014
130	Digital heat meter	6589906	0.50%	3 years	13/10/2011	12/10/2014
131	Digital heat meter	001301Y041	0.50%	3 years	13/10/2011	12/10/2014
132	Digital heat meter	8485647	0.50%	3 years	13/10/2011	12/10/2014
133	Digital heat meter	6807335	0.50%	3 years	13/10/2011	12/10/2014
134	Digital heat meter	6988151	0.50%	3 years	13/10/2011	12/10/2014
135	Digital heat meter	6674647	0.50%	3 years	13/10/2011	12/10/2014
136	Digital heat meter	6485637	0.50%	3 years	13/10/2011	12/10/2014
137	Digital heat meter	6826947	0.50%	3 years	13/10/2011	12/10/2014
138	Digital heat meter	6674649	0.50%	3 years	13/10/2011	12/10/2014
139	Digital heat meter	6485649	0.50%	3 years	13/10/2011	12/10/2014
140	Digital heat meter	6485658	0.50%	3 years	13/10/2011	12/10/2014
141	Digital heat meter	6826950	0.50%	3 years	13/10/2011	12/10/2014
142	Digital heat meter	6636794	0.50%	3 years	13/10/2011	12/10/2014
143	Digital heat meter	6485629	0.50%	3 years	13/10/2011	12/10/2014
144	Digital heat meter	6485606	0.50%	3 years	13/10/2011	12/10/2014
145	Digital heat meter	6485609	0.50%	3 years	13/10/2011	12/10/2014
146	Digital heat meter	6485630	0.50%	3 years	13/10/2011	12/10/2014
147	Digital heat meter	6826946	0.50%	3 years	13/10/2011	12/10/2014
148	Digital heat meter	6826953	0.50%	3 years	13/10/2011	12/10/2014
149	Digital heat meter	6485635	0.50%	3 years	13/10/2011	12/10/2014
150	Digital heat meter	6485625	0.50%	3 years	13/10/2011	12/10/2014

151	Digital heat meter	6988153	0.50%	3 years	13/10/2011	12/10/2014
152	Digital heat meter	6807416	0.50%	3 years	13/10/2011	12/10/2014
153	Digital heat meter	6589904	0.50%	3 years	13/10/2011	12/10/2014
154	Digital heat meter	6485633	0.50%	3 years	13/10/2011	12/10/2014
155	Digital heat meter	6485618	0.50%	3 years	13/10/2011	12/10/2014
156	Digital heat meter	984301Y410	0.50%	3 years	13/10/2011	12/10/2014
157	Digital heat meter	983801Y410	0.50%	3 years	13/10/2011	12/10/2014
158	Digital heat meter	983601Y410	0.50%	3 years	13/10/2011	12/10/2014
159	Digital heat meter	6807419	0.50%	3 years	13/10/2011	12/10/2014
160	Digital heat meter	6807437	0.50%	3 years	13/10/2011	12/10/2014
161	Digital heat meter	6807411	0.50%	3 years	13/10/2011	12/10/2014
162	Digital heat meter	6807452	0.50%	3 years	13/10/2011	12/10/2014
163	Digital heat meter	6807382	0.50%	3 years	13/10/2011	12/10/2014
164	Digital heat meter	6807442	0.50%	3 years	13/10/2011	12/10/2014
165	Digital heat meter	6807446	0.50%	3 years	13/10/2011	12/10/2014
166	Digital heat meter	6807433	0.50%	3 years	13/10/2011	12/10/2014
167	Digital heat meter	6554411	0.50%	3 years	13/10/2011	12/10/2014
168	Digital heat meter	6988143	0.50%	3 years	13/10/2011	12/10/2014
169	Digital heat meter	6807432	0.50%	3 years	13/10/2011	12/10/2014
170	Digital heat meter	6807441	0.50%	3 years	13/10/2011	12/10/2014
171	Digital heat meter	6807415	0.50%	3 years	13/10/2011	12/10/2014
172	Digital heat meter	6807333	0.50%	3 years	13/10/2011	12/10/2014
173	Digital heat meter	6674646	0.50%	3 years	13/10/2011	12/10/2014
174	Digital heat meter	6674656	0.50%	3 years	13/10/2011	12/10/2014

5. $FC_{i,j,y}$

Location	Type	SN	accuracy class	Calibration frequency	Date of Calibration	Validity
CHP	strap balance 1	990601	0.5	annually	08/10/2011	07/10/2012
	strap balance 2	990602	0.5	annually	08/10/2011	07/10/2012
	weigh bridge 1	161898	III	annually	07/08/2011	06/08/2012
	weigh bridge 2	161899	III	annually	07/08/2011	06/08/2012
Xingfu Road HOB	strap balance	P0040459	0.5	annually	11/10/2011	10/10/2012
	weigh bridge	2011059	III	annually	19/06/2011	18/06/2012
Guangming Rod HOB	strap balance	PD040460	0.5	annually	10/10/2011	09/10/2012
	weigh bridge	2011043	III	annually	05/06/2011	04/06/2012
Weihuliang HOB	strap balance	PD030238	0.5	annually	10/10/2011	09/10/2012
	weigh bridge	406647	III	annually	08/07/2011	07/07/2012
Xinsheng HOB	strap balance	PD017480	0.5	annually	10/09/2011	09/09/2012
	weigh bridge	2010095	III	annually	10/09/2011	09/09/2012

History of the document

Version	Date	Nature of revision
02.0	EB 66 13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).
01	EB 54, Annex 34 28 May 2010	Initial adoption.
Decision Class: Regulatory **Document Type**: Form **Business Function**: Issuance		