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

CONTENTS

* as contained within the document entitled "Guidelines for completing the monitoring report form (CDM-MR)" (EB 54 meeting report, annex 34).

MONITORING REPORT
Version: 01 Date: 15/11/2011
Yunnan Hongta Cement Waste Heat Recovery Power Generation Project
Reference number: 3674
The 1st monitoring period: 08/10/2010-17/10/2011

SECTION A. General description of the project activity

A.1. Brief description of the project activity:

The main purpose of the Yunnan Hongta Cement Waste Heat Recovery Power Generation Project (hereafter refers to 'the Project') is to develop a power generation system through recovery and utilization of waste heat from one existing 3000t/d clinker production line. After deducting a small part of electricity utilized by the waste heat recovery system, the electricity generated by the Project will be used onsite for the cement production which will substitute those from the China Southern Power Grid in the absence of the Project.

The Project is designed to install one set of suspension preheater (SP boiler), one set of air quencher cooler (AQC boiler) and one set of turbine generator. The total installed capacity of the Project is 6MW.

The Project was constructed on 22/08/2008 and put into operation on 17/09/2009.

Total emission reductions achieved in this monitoring period is 28611.94 tCO_2e (from 08/10/2010 to 17/10/2011).

A.2. Project Participants

Name of Party involved (*) ((host) indicates a host Party)	Private and/or public entity(ies) project participants (*) (as applicable)	Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No)
People's Republic of China (host)	Yunnan Hongta Dianxi Cement Co., Ltd.	No
United Kingdom	British Gas Trading Limited	No

A.3. Location of the project activity:

The proposed project is located in Shangdeng Industrial area, Dali Economic Development Zone, Dali Prefecture, Yunnan Province, P.R. China. The geographical coordinates are east longitude 100°20′32′′~E100°20′45′′ and north latitude N25°40′55′′~N25°41′11′′. Detailed physical location follows as Fig1.

Fig1. Location of the project

A.4. Technical description of the project

The Project will utilize waste heat at existing facilities as an energy source for generation of electricity. The Project adopts low-temperature waste heat recovery for power generation technology. The WHR system used in this Project activity consists of two heat recovery boilers (also called heat recovery steam generators, or HRSG) and a single power generator (also called a turbine). The WHR system re-routes the wasted heat to the two HRSGs: one on the suspension preheater and one on the air quencher cooler. Steam from the SP and AQC boilers is combined to power a turbine which produces electricity. All the equipments employed are domestically manufactured. So there is no technology transferred involved in the Project.The key technical parameters detailed in the following table.

Table A-1 General information about technical parameter

Device Name	Quantity	Technical Parameter
Steam Turbine	1	Model: BN6.0－2.29/0.20 Rated Power: 6MW Rated Rotation Speed: 3,000r/min Rated Inlet Steam Pressure: 2.29MPa Rated Inlet Steam Temperature: 370℃ Rated Second Inlet Steam Pressure: 0.20MPa Rated Second Inlet Steam Temperature: 150℃ Exhaust Pressure: 0.007Mpa

		Designed life time: > 30 years Manufacturer: Qingdao Jieneng Steam turbine Group Co., Ltd.
Generator	1	Model: QF_1－6－2 Rated Power: 6MW Rated rotation speed: 3,000r/m Designed life time: > 30 years Manufacturer: Sichuan Dongfeng Electric Factory Co., Ltd
AQC boiler	1	Model: QC148/380-15.5(2.5)-2.3(0.3)/(160) Inlet Gas Flow: 148,000m^3/h Inlet Gas Temperature: 380℃ Rated Steam Flow: 15.5/2.5t/h Rated Steam Pressure: 2.3/0.3MPa Feed Water Temperature: 100/30℃ Designed life time: >20 years Manufacturer: Sichuan Chuanrun Dynamical Equipment Co., Ltd
SP boiler	1	Model: QC241/365-22(5.4)-2.3(0.2)/235(160) Inlet Gas Flow: 241,000m^3/h Inlet Gas Temperature: 365℃ Rated Steam Flow: 22/5.4t/h Rated Steam Pressure: 2.3/0.2MPa Rated Steam Temperature: 235/160℃ Feed Water Temperature: 100/30℃ Designed life time: >20 years Manufacturer: Sichuan Chuanrun Dynamical Equipment Co., Ltd
ASH boiler	1	Model: QC50/526-38-2.3/380 Inlet Gas Flow: 50,000m^3/h Inlet Gas Temperature: 526℃ Rated Steam Flow: 38t/h Rated Stem Pressure: 2.3MPa Rated Steam Temperature: 380℃ Inlet Steam Temperature: 220℃ Designed life time: > 20 years Manufacturer: Sichuan Chuanrun Dynamical Equipment Co., Ltd

The turbines and generators will be supplied by homemade companies. So no technology transferred from other countries is involved in this project activity.

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

Based on the information provided in Appendix C of the Simplified Modalities and Procedures for Small-Scale CDM project activities, the approved baseline methodology applied to the proposed project as follows:

AMS-III.Q (Version 02) - "Waste Energy Recovery (gas/ heat/pressure) Projects".

Methodology AMS-III.Q also refers to:

1. Appendix B of the UNFCCC's published simplified modalities and procedures for small-scale activities

2. The approved "Tool to calculate the emission factor for an electricity system" (Version 02).

More information about the methodology can be obtained at:

http://cdm.unfccc.int/methodologies/SSCmethodologies/approved.html

http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html

A.6. Registration date of the project activity:

The project is registered as a CDM project on 08/10/2010.

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

Start date of crediting period: 08/10/2010
Choice of crediting period: 10-year fixed

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

The Monitoring Report was completed by:

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SECTION B. Implementation of the project activity

B.1. Implementation status of the project activity

The proposed project was put into operation on 17/09/2009 and it only consists of one site and the implementation is not phased.

There is no special events happened during the monitoring period. No overhaul or equipment exchange occurred during this monitoring period (08/10/2010-17/10/2011). The Project was strictly operated in compliance with the description in registered PDD. Monitoring of the required parameters, data recording and collection were in line with the registered PDD.

B.2. Revision of the monitoring plan

No request for revision was applied for during this monitoring period.

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

No request for deviation was applied for during this monitoring period.

B.4. Notification or request of approval of changes

No notification or request of approval was applied for during this monitoring period.

SECTION C. Description of the monitoring system

C1. Monitoring system

The monitoring system is established according to the monitoring plan in the registered PDD. The electrical connection diagram of the Project is in the following.

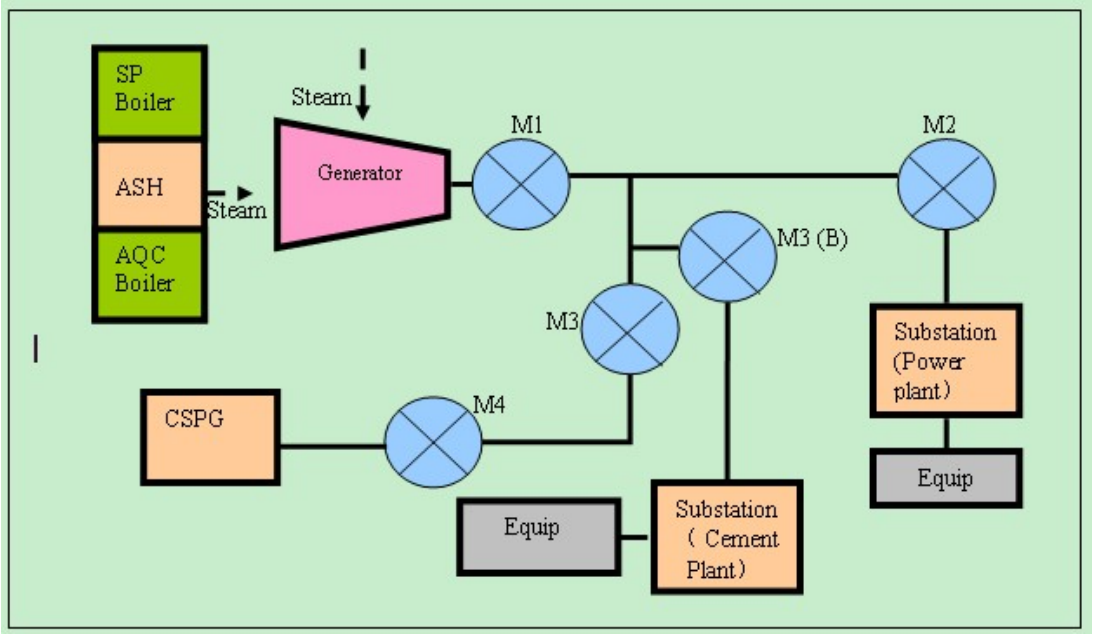

Fig2. Simplified diagram of ammeter installation

1) Data collection

The parameters need to be monitored are:

1. The total electricity quantity generated by the Project ($EG_{total,y}$)
2. The electricity quantity connected to the grid by the Project ($EG_{pj\ to\ grid,y}$)
3. The electricity quantity supplied to the Project from the grid ($EG_{grid\ to\ pj,y}$)
4. The quantity of actual output energy recovered by the Project ($Q_{OE,y}$), as all waste heat recovered by the project is for generating electricity, so this parameter has the same meaning with $EG_{total,y}$.

2) Data generation

The meter M1 will monitor the total electricity quantity generated by the Project ($EG_{total,y}$). As all waste heat recovered by the project is for generating electricity, M1 also monitor the actual energy generated by the Project ($Q_{OE,y}$).

The meter M2 will monitor the electricity consumed by the power plant.

The meter M3 is a bidirectional electricity meter that will monitor both the electricity connected to the grid by the Project ($EG_{pj\ to\ grid,y}$) and the electricity supplied to the Project from the grid ($EG_{grid\ to\ pj,y}$).

The meter M3 (B) is a backup meter of meter M3.

The meter M4 is managed by the Electric Power Bureau and will also monitor both the electricity connected to the grid by the Project ($EG_{pj\ to\ grid,y}$) and the electricity supplied to the Project from the grid ($EG_{grid\ to\ pj,y}$).

3) Data aggregation and recording

The power plant staffs are in charge of recording the reading of meter M1, M2, M3 and M3 (B), meanwhile, the Electric Power Bureau could recording the readings of meter M4. The data collected daily are then aggregated into monthly report, which constitutes the basis for monitoring report. The calibration of the metering instruments is conducted every year.

C2. Monitoring Organization

Prior to the started of the crediting period, the Project owner has pointed out a CDM group and developed a CDM Monitoring Plan to ensure that the daily operation of the Project is well organized in terms of collecting and archiving complete and reliable data. All staff involved in the CDM group has clear roles and responsibilities. The structure of the monitoring organization is shown below.

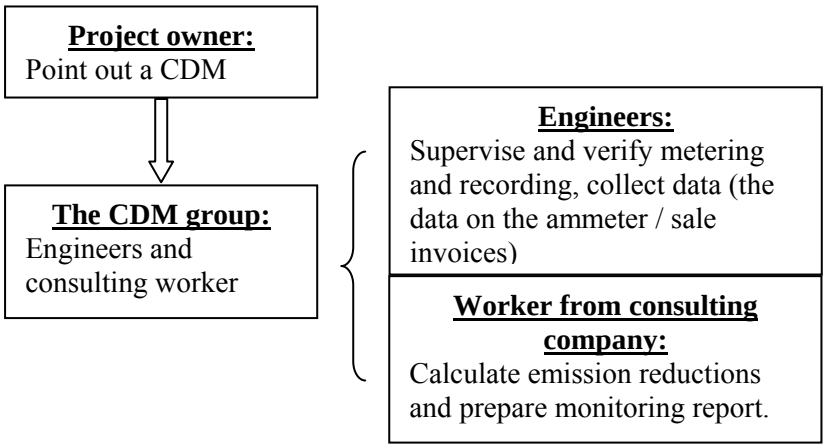

Fig3. The monitoring structure

The CDM group consists of engineers in the plant and workers from CDM consulting company. The engineers will supervise and verify metering and recording, collect data (the data on the ammeter / sale invoices). There is a general manager in CDM group who is responsible for supervise all the relevant activities during the operating and the maintaining period. The readings of each meter will be recorded every day by particular person and checked by the general manager in CDM group. The CDM consulting workers will calculate emission reductions and prepare monitoring report.

All the data will be archived after checking and ensuring that there are no material mistakes.

C3. Procedures in case of Emergencies

In case of emergencies, the project entity will claim emission reduction following the below processed:

1) In the event that a meter has lost calibration over the allowable error limit then this shall be corrected at the earliest opportunity and re-calibrated.
2) According to the registered PDD, the recordings of meter M3, M3 (B) and M4 can be used as back up data for each other, so in the event that there is uncertainty over the accuracy of one of these meters, then data from other meters can be recorded for reference.

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:	EF_y
Data unit:	tCO_2/MWh
Description:	The emission factor of CSPG
Source of data used:	2008 Baseline Emission Factors of Power Grids in China published by NDRC
Value(s) :	0.8712
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Used for calculating the baseline emission
Additional comment:	Details as shown in the registered PDD

Data / Parameter:	$Q_{OE,BL}$
Data unit:	MWh
Description:	The amount of electricity generation that can be theoretically produce (in unit of MWh), to be determined on the basis of maximum recoverable energy from the waste heat
Source of data used:	Registered PDD
Value(s) :	42,380
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Used for calculating the f_{cap}
Additional comment:	

D.2. Data and parameters monitored	
Data / Parameter:	$EG_{total,y}$
Data unit:	MWh
Description:	The total electricity generated by the project in year y
Measured /Calculated /Default:	Measured by the meter M1
Source of data:	Meter records
Value(s) of monitored parameter:	<table><tr><th>Starting time</th><th>Ending time</th><th>$EG_{total,y}$ (MWh)</th></tr><tr><td>08/10/2010</td><td>17/10/2011</td><td>35559.072</td></tr></table>
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Used for the baseline emission calculations and calculation of the f_{cap}
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Type: DSSD331 Accuracy class: 0.5s Serial number: 350313 Calibration frequency: Every year Date of last calibration: 23/06/2011 Validity:23/06/2011-22/06/2012
Measuring/ Reading/ Recording frequency:	Measured continuously and recorded monthly
Calculation method (if applicable):	/
QA/QC procedures applied:	The meter M1 has been regularly checked following the relevant Chinese standards.

Data / Parameter:	$EG_{pj\ to\ grid\ ,y}$
Data unit:	MWh
Description:	The electricity quantity connected to the grid by the project
Measured /Calculated /Default:	Measured by the meter M3
Source of data:	Meter records
Value(s) of monitored parameter:	<table><tr><th>Starting time</th><th>Ending time</th><th>$EG_{pj\ to\ grid\ ,y}$ (MWh)</th></tr><tr><td>08/10/2010</td><td>17/10/2011</td><td>33020.496</td></tr></table>
Indicate what the data are used for (Baseline/ Project/	Used for the baseline emission calculations

Leakage emission calculations)	
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Type: DSSD331 Accuracy class: 0.5s Serial number: 350190 Calibration frequency: Every year Date of last calibration: 23/06/2011 Validity:23/06/2011-22/06/2012
Measuring/ Reading/ Recording frequency:	Measured continuously and recorded monthly
Calculation method (if applicable):	/
QA/QC procedures applied:	The meter M3 has been regularly checked following the relevant Chinese standards.

Data / Parameter:	$EG_{grid\ to\ pj\ ,y}$
Data unit:	MWh
Description:	The electricity quantity supplied to the project from the grid
Measured /Calculated /Default:	Measured by the meter M3
Source of data:	Meter records
Value(s) of monitored parameter:	Starting time: 08/10/2010; Ending time: 17/10/2011; $EG_{grid\ to\ pj\ ,y}$ (MWh): 136.512
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Used for the baseline emission calculations
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Type: DSSD331 Accuracy class: 0.5s Serial number: 350190 Calibration frequency: Every year Date of last calibration: 23/06/2011 Validity:23/06/2011-22/06/2012
Measuring/ Reading/ Recording frequency:	Measured continuously and recorded monthly
Calculation method (if applicable):	/
QA/QC procedures applied:	The meter M3 has been regularly checked following the relevant Chinese standards.

Data / Parameter:	$EG_{pj\ to\ grid\ ,y}$
Data unit:	MWh
Description:	The electricity quantity connected to the grid by the project
Measured /Calculated /Default:	Measured by the meter M4
Source of data:	Meter records
Value(s) of monitored parameter:	Starting time: 08/10/2010; Ending time: 17/10/2011; $EG_{pj\ to\ grid\ ,y}$ (MWh): 32978.33
Indicate what the data are	Used for the baseline emission calculations

used for (Baseline/ Project/ Leakage emission calculations)	
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Type: DSSD331 Accuracy class: 0.5s Serial number: 740022 Calibration frequency: Every year Date of last calibration: 23/06/2011 Validity:23/06/2011-22/06/2012
Measuring/ Reading/ Recording frequency:	Measured continuously and recorded monthly
Calculation method (if applicable):	/
QA/QC procedures applied:	The meter M4 has been regularly checked following the relevant Chinese standards.

Data / Parameter:	$EG_{grid\ to\ pj\ ,y}$
Data unit:	MWh
Description:	The electricity quantity supplied to the project from the grid
Measured /Calculated /Default:	Measured by the meter M4
Source of data:	Meter records
Value(s) of monitored parameter:	Starting time: 08/10/2010; Ending time: 17/10/2011; $EG_{grid\ to\ pj\ ,y}$ (MWh): 136.338
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Used for the baseline emission calculations
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Type: DSSD331 Accuracy class: 0.5s Serial number: 740022 Calibration frequency: Every year Date of last calibration: 23/06/2011 Validity:23/06/2011-22/06/2012
Measuring/ Reading/ Recording frequency:	Measured continuously and recorded monthly
Calculation method (if applicable):	/
QA/QC procedures applied:	The meter M4 has been regularly checked following the relevant Chinese standards.

Data / Parameter:	$Q_{OE,y}$
Data unit:	MWh
Description:	The actual electricity generation by the Project activity in year y
Measured /Calculated /Default:	Measured by the meter M1
Source of data:	Meter records
Value(s) of monitored parameter:	Starting time: 08/10/2010; Ending time: 17/10/2011; $Q_{OE,y}$ (MWh): 35559.072

Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Used for the baseline emission calculations
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Type: DSSD331 Accuracy class: 0.5s Serial number: 350313 Calibration frequency: Every year Date of last calibration: 23/06/2011 Validity:23/06/2011-22/06/2012
Measuring/ Reading/ Recording frequency:	Measured continuously and recorded monthly
Calculation method (if applicable):	/
QA/QC procedures applied:	The meter M1 has been regularly checked following the relevant Chinese standards.

SECTION E. Emission reductions calculation

E.1. Baseline emissions calculation

According to Baseline Methodology AMS III.Q and the registered PDD, baseline emissions generated by waste heat can be calculated as follows:

$$BE_{Elec,y} = f_{cap} * f_{wcm} * \sum_{j} \sum_{i} (EG_{i,j,y} * EF_{Elec,i,j,y})$$

Where,

$BE_{elec,y}$ = Baseline emissions due to displacement of electricity during the year y in tons of CO_2

$EG_{i,j,y}$ = The quantity of electricity supplied to the recipient j by generator, that in the absence of the project activity would have been sourced from i source (i can be either grid or identified source) during the year y in MWh

$EF_{elec,i,j,y}$ = The CO_2 emission factor of CSPG in tCO_2/MWh, according to the registered PDD, this factor is 0.8712 tCO_2/MWh

f_{wcm} = Fraction of total electricity generated by the project activity using waste energy. Due to the Project activity is purely from use of waste energy of cement production, as per the methodology AMS-III.Q, the f_{wcm} is 1.

f_{cap} = Capping factor to exclude increased waste energy utilization in the project year y due to increased level of activity of the plant, relative to the level of activity in the base years before project start. The ratio is 1 if the waste energy generated in project year y is same or less than that generated in base years

Calculation of f_{cap}

$$f_{cap} = \frac{Q_{OE,BL}}{Q_{OE,y}}$$

Where:

$Q_{OE,BL}$ = The amount of electricity generation that can be theoretically produce (in unit of MWh), to be determined on the basis of maximum recoverable energy from the waste heat

$Q_{OE,y}$ = the quantity of actual output/intermediary energy during the year y (in unit of MWh)

During the first crediting period from 08/10/2010 to 17/10/2011, the $Q_{OE,BL}$ is 43425 MWh, and the $Q_{OE,y}$ is 35559.072 MWh, so the f_{cap} is calculated as 1.22>1, therefore, this parameter can be assumed as 1.

Determination of $EG_{i,j,y}$

The net electricity quantity of meter M3 is

M3 = $EG_{pj\ to\ grid,y}$ - $EG_{grid\ to\ pj,y}$ = 33020.496 - 136.512 = 32883.984 MWh

And, the net electricity quantity of meter M4 is

M4 = $EG_{pj\ to\ grid,y}$ - $EG_{grid\ to\ pj,y}$ = 32978.33 - 136.338 = 32841.992 MWh

For conservative approach, 32841.992 (MWh) which is the records of meter M4 managed by the Electric Power Bureau, is used for baseline emission calculation.

Baseline emission

$BE_{elec,y} = f_{cap} * f_{wcm} * EF_y * EG_y$

=1 * 1 * 0.8712 * 32841.992

= 28611.94 tCO_2e

E.2. Project emissions calculation

According to the registered PDD, there is no combustion of auxiliary fuels, therefore the project emissions are zero (PE_y=0).

E.3. Leakage calculation

According to Methodology AMS-III.Q and registered PDD, the leakage emission is not considered in the project, hence L_y=0.

E.4. Emission reductions calculation / table

Calculation of emission reduction	Symbol	Amount	Unit	Formula
Baseline emission	BE_y	28611.94	tCO_2e	$BE_y=EG_y*EF_y$
Project emission	PE_y	0	tCO_2e	/
Leakage emission	L_y	0	tCO_2e	/
Emission reduction	ER_y	28611.94	tCO_2e	$ER_y=BE_y-PE_y-L_y$

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 (tCO_2e)	**34993.08 (34151/365*374)**	**28611.94**

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

The estimated emission reductions in registered PDD are 34993.08 tCO_2e for this monitoring period, while the actual values achieved during this monitoring period are 28611.94 tCO_2e, which is 18.2% lower than the estimated one. The difference is due to the unstable operation of the cement production line and the low temperature of the waste heat at the inlet of the boilers.

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History of the document

Version	Date	Nature of revision
01	EB 54, Annex 34 28 May 2010	Initial adoption.
Decision Class: Regulatory **Document Type**: Guideline, Form **Business Function**: Issuance		