

Monitoring report form (Version 03.2)

Monitoring report

Title of the project activity	The CDQ Project in Tranvic Group
Reference number of the project activity	GS2460
Version number of the monitoring report	02.1
Completion date of the monitoring report	18/12/2014
Registration date of the project activity	10/03/2014
Monitoring period number and duration of this monitoring period	1st monitoring period, 301 days (13/05/2013-09/03/2014, first and last days included)
Project participant(s)	Neijiang Bowei Xinyu Chemical Industry Co., Ltd. (project owner) Carbon Invcap International Trading Co., Ltd. (buyer)
Host Party(ies)	People's Republic of China
Sectoral scope(s) and applied methodology(ies)	01 Energy industries (renewable - / non-renewable sources); 04 Manufacturing industries ACM0012 (version 04.0.0) – <i>Consolidated baseline methodology for GHG emission reductions from waste energy recovery projects</i>
Estimated amount of GHG emission reductions or net anthropogenic GHG removals by sinks for this monitoring period in the registered PDD	126,525tCO ₂ e
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period	98,664tCO ₂ e For 2013: 76,338 tCO ₂ e For 2014: 22,326 tCO ₂ e
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved during the period up to 31 December 2012(if applicable)	NA
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved during the period from 1 January 2013 onwards (if applicable).	NA

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

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The purpose of the report is to calculate the emission reductions generated by The CDQ Project in Tranvic Group (thereafter referred to as the Project) during the retroactive monitoring period (13/05/2013-09/03/2014, including both days), and to serve as basis for the verification and issuance of corresponding GS VERs. The Project has been registered as a GS VER project on 10/03/2014 (GS registration reference number: GS2460).

The Project, is sited within the production area of Tranvic Group, Lianjie town, Weiyuan county, Neijiang city, Sichuan province, P.R. of China, owned by Neijiang Bowei Xinyu Chemical Industry Co., Ltd., the daughter company of Tranvic Group. The Project installed one set of 170t/h CDQ system with a capacity of 30MW steam turbine/generator unit to recover the waste heat released into the atmosphere in the absence of the project activity to generate electricity for captive use, and estimated annual net electricity supply amounts to 209,088MWh. The electricity generated by the Project displace electricity which would have been supplied by the operation of grid-connected power plants and by the addition of new generation sources within the Central China Power Grid (CCPG), which is the same as the baseline scenario of the project. By recovering the waste heat generated in coke production for captive use to displace the equivalent electricity generation by the CCPG, the project leads to the reduction of CO₂ emissions into the atmosphere. The project activity achieves average greenhouse gas (GHG) emission reductions of 153,428tCO₂e annually under the baseline scenario.

The project utilizes the waste heat released into the atmosphere in the absence of the project activity to generate electricity. The electricity generated displaces electricity which would have been supplied by the CCPG which is dominated by fossil fuel fired power plants. The project scenario existing prior to the implementation of the project activity is same as the baseline scenario of the project, that is, coke wet quenching (CWQ) system is used and waste heat is released to the atmosphere.

Relevant dates for the Project are as follows:

Construction start date: 01/06/2012

Commissioning start date: 13/05/2013

Continued operation periods: 20 year

During the retroactive monitoring period (13/05/2013 to 09/03/2014, including both days), the net electricity supplied to Tranvic Group is 147,487.15MWh. The monitoring activities were conducted in accordance with the monitoring plan in the registered GS-PDD and the registered GS passport. The project has operated without any accidental or emergency events that might impact the accuracy and/or implementation of monitoring activities. And during the monition period, no any events that might impact the sustainability. The total emission reductions in this monitoring period (13/05/2013 to 09/03/2014, including both days) are 98,664 tCO₂e, for year 2013 are 76,338 tCO₂e, for year 2014 are 22,326tCO₂e.

A.2. Location of project activity

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The project is sited in Lianjie town, Weiyuan county, Neijiang city, Sichuan province, P.R. of China, with central geographical coordinates of east longitude of 104°29'05"and north latitude of 29°43'11".

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)
People's Republic of China (Host)	Neijiang Bowei Xinyu Chemical Industry Co., Ltd. (Project owner)	No
United Kingdom of Great Britain and Northern Ireland	Carbon Invcap International Trading Co., Ltd. (Buyer)	No
...	...	

A.4. Reference of applied methodology

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The methodology applied for the Project is the approved consolidated baseline and monitoring methodology ACM0012 "Consolidated baseline methodology for GHG emission reductions from waste energy recovery projects" (version 04.0.0).

The approved "Tool to calculate the emission factor for an electricity system" (Version 03.0.0) are also employed for the calculation of emission factor.

The approved "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" (version 01) was applied to calculate the project emission.

For more information about the methodology and tools, please refer to:

<http://cdm.unfccc.int/methodologies/PAMethodologies/approved.html>

A.5. Crediting period of project activity

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10 years fixed crediting period is adopted by the project. The crediting period of the project activity is from 13/05/2013 to 12/05/2023.

SECTION B. Implementation of project activity**B.1. Description of implemented registered project activity**

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The project started operation on 01/06/2012. The implementation of the project is not phased. During the monitoring period, the Project was in continuous operation. No equipment was exchanged or overhauled. No events occurred that affected the applicability of the methodology. The Project owner implements and operates the Project as per the registered GS-PDD and GS passport.

Major technical parameters of the key equipments employed by the project are illustrated in Table 1.

Table 1. Major technical parameters of the key equipments of the Project

Main Technical Data		The project
Waste Heat Boiler	Type	Q270/970-108.3-9.8/540
	Unit	1

		Capacity	108.3 t/h
		Operational Life	20
	Steam Turbine	Model	Condensing
		Type	N30-8.83
		Unit	1
	Generator	Type	QF ₂ W-30-2
		Unit	1
		Rated Capacity	30MW
		Operational Life	20

B.2. Post registration changes**B.2.1. Temporary deviations from registered monitoring plan or applied methodology**

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There is no temporary deviation from registered monitoring plan or applied methodology.

B.2.2. Corrections

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There is no correction.

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

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There is no permanent change from registered monitoring plan or applied methodology.

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

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There is no change to project design of registered project activity.

B.2.5. Changes to start date of crediting period

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There is no change to start date of crediting period.

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

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Not applicable

SECTION C. Description of monitoring system

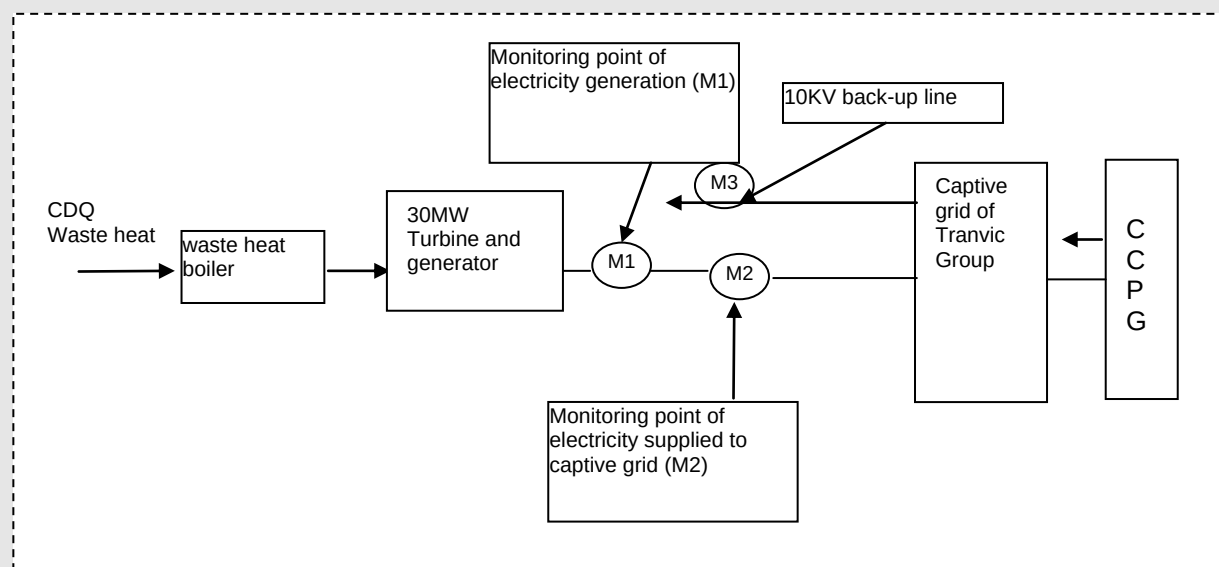
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Monitoring system arrangement

Three meters M1, M2 and M3 were installed, and M1 meter measures the power generation of the Project, M2 meter

measures quantity of net electricity generation supplied by the project for captive use, and M3 meter measure the self use electricity from the 10KV backup line.

The diagram of the technical process was shown in figure 1.



* It is noted that the Project is sited with the production area of Tranvic Group, the Recipient facility. The electricity generated by the project was delivered to the captive grid of Tranvic Group, which covers the production area of Tranvic Group, including the Project. So, the electricity meters M1, M2 and M3 measure the electricity supplied to the recipient facility and from the project facility. So the electricity measurements satisfy the requirement of ACM0012.

meter	M1	M2	M3
Function	The meter of power generation	The meter of electricity supplied to the captive grid by the project	The meter of 10KV backup line
Parameter monitored	$Q_{OE,y}$	$EG_{PJ,y}$	$EC_{PJ,j,y}$
Accuracy	0.2S	0.5%	0.5%
Bi-direction	No	No	No
Location	outlet side of the generator	JH905 cabinet	JH906 cabinet

Figure 1. The diagram of the monitoring system

Management Structure

Detailed regarding the management structure of the monitoring plan please refers to Figure 2.

Project owners

Personnel in charge of the GS VER

In full charge of issues related to GS VER projects, in particular:

- (1) tracking the development of GS VER, keeping communication with GSF and buyer and related agencies;
- (2) supervising the project operation status related to data monitoring and the monitoring process as well, ensuring a smooth and orderly monitoring process;
- (3) in charge of activities related to GS VER issuance, ensuring the completeness and accuracy of related data.

Financial Department

In charge of collecting data required by the checking activity, including meter readings records, the records of coke production.

Technical Department

In charge of calibrating and maintaining the electricity meter, and checking, archiving and managing data

Other Departments

Under the guidance of the Personnel in charge of GS VER project, do relevant monitoring tasks.

Operation staff

In charge of measuring the monitoring data

Figure 2. Management Structure of Monitoring Plan

Monitoring Measures

M1 meter measures the power generation of the Project, M2 meter measures quantity of net electricity generation supplied by the project for captive use, and M3 meter measure the self use electricity from the 10KV backup line.

Installation of monitoring devices

The electricity meters of the Project were installed according to the *Technical Administrative Code of Electric Energy Metering* (DL/T 448-2000). Before the operation of the Project, the project owner will check and accept those electricity meters as per the Technical Norm.

Calibration of Meters & Metering

The regular calibration and on-site verification should be implemented as per the Technical administrative code of electric energy metering (DL/T 448-2000) to ensure the precision of electricity meters. Electricity meters should be calibrated every year. After calibration, the electricity meters must be sealed.

Quality Assurance and Quality Control

The quality assurance and quality control procedures consist of data recording; maintaining and archiving. The quality assurance and quality control procedures should be improved according to the CDM EB regulation and the real operating conditions during the project operation period.

Data Management System

Specific staff will be appointed by the project owner to take on the overall responsibility for monitoring greenhouse gas emission reductions and keeping all the data collected as part of monitoring. Data shall be archived electronically and be kept at least for 2 years after the end of the last crediting period or the last issuance of VERs, whichever occurs later.

SECTION D. Data and parameters

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

(Copy this table for each piece of data and parameter.)

Data / Parameter:	$EF_{grid,CM,y}$
Unit:	tCO ₂ e/MWh
Description:	Emission factor of CCPG in the monitoring period.
Source of data:	Registered GS-PDD
Value(s) applied):	0.7338
Purpose of data:	Calculation of baseline emissions
Additional comment:	This parameter is ex ante determined in PDD and fixed during the fixed crediting period.

Data / Parameter:	f_{wcm}
Unit:	-
Description:	Fraction of total energy generated by the project activity using waste gas.
Source of data:	Registered GS-PDD
Value(s) applied):	1
Purpose of data:	Calculation of baseline emissions
Additional comment:	This parameter is ex ante determined in PDD and fixed during the fixed crediting period.

Data / Parameter:	f_{cap}
Unit:	Fraction
Description:	Energy that would have been produced in project year y using waste energy generated in base year expressed as a fraction of total energy produced using waste source in year y.
Source of data:	Registered GS-PDD
Value(s) applied):	1
Purpose of data:	Calculation of baseline emissions.
Additional comment:	The project entity will monitor electrical output of the project activity in accordance with the methodology and f_{cap} will be updated ex-post in case the actual electrical output exceeds the electrical output which is theoretically available on the basis of current baseline conditions.

Data / Parameter:	$Q_{OE,BL}$
Unit:	MWh
Description:	Output/intermediate energy that can be theoretically produced, to be determined on the basis of maximum recoverable energy from the WECM, which would have been wasted in the absence of the project.
Source of data:	Registered GS-PDD
Value(s) applied:	254,368.7999
Purpose of data:	Calculation of baseline emissions
Additional comment:	If the annual power generation is larger than the value, the f_{cap} must be re-calculated.

D.2. Data and parameters monitored

(Copy this table for each piece of data and parameter.)

Data / Parameter:	$EG_{PJ,y}$
Unit:	MWh
Description:	Quantity of net electricity generation supplied by the project for captive use
Measured/ Calculated / Default:	measured
Source of data:	Directly measured by electricity meter (M2).
Value(s) of monitored parameter:	147,487.15
Monitoring equipment:	The monitoring meter M2: Type: electricity meter Accuracy class: 0.5% Serial number: 12040254 Calibration frequency: annually Previous calibration date:10/04/2013 validity: 09/04/2014
Measuring/ Reading/ Recording frequency:	The readings of electricity meter were continuously measured and at least monthly recorded. Data will be archived for 2 years following the end of the crediting period or the last issuance of ERs, whichever is later.
Calculation method (if applicable):	
QA/QC procedures:	The electricity meters are calibrated regularly.
Purpose of data:	Baseline emission calculations
Additional comment:	

Data / Parameter:	$EC_{PJ,i,y}$
Unit:	MWh
Description:	The additional power consumed in year y as a result of the implementation of the project activity source j
Measured/ Calculated / Default:	measured

Source of data:	Directly measured by electricity meter (M3) in the 10kV backup line.
Value(s) of monitored parameter:	11,913.249
Monitoring equipment:	The monitoring meter M3: Type: electricity meter Accuracy class: level 0.5% Serial number: 12070107 Calibration frequency: annually Previous calibration date:10/04/2013 validity: 09/04/2014
Measuring/ Reading/ Recording frequency:	The readings of electricity meter were continuously measured and at least monthly recorded. Data will be archived for 2 years following the end of the crediting period or the last issuance of ERs, whichever is later.
Calculation method (if applicable):	-
QA/QC procedures:	The electricity meters will be calibrated regularly.
Purpose of data:	Baseline and project emission calculations
Additional comment:	

Data / Parameter:	$Q_{OE,y}$
Unit:	MWh
Description:	Quantity of actual output energy during year y, i.e. the total power generation of the power plant.
Measured/ Calculated / Default:	Measured
Source of data:	Directly measured by electricity meter (M1) at the outlet of the generator
Value(s) of monitored parameter:	155,510
Monitoring equipment:	The monitoring meter M1: Type: electricity meter Accuracy class: 0.2S Serial number: D1165647 Calibration frequency: annually Previous calibration date:10/04/2013 validity: 09/04/2014
Measuring/ Reading/ Recording frequency:	The readings of electricity meter were continuously measured and at least monthly recorded. Data will be archived for 2 years following the end of the last crediting period or the last issuance of ERs, whichever is later.
Calculation method (if applicable):	
QA/QC procedures:	Measuring equipment was calibrated annually.
Purpose of data:	Baseline emission calculations
Additional comment:	

Data / Parameter:	$TDL_{j,y}$
Unit:	
Description:	Average technical transmission and distribution losses for providing electricity to source j in year 2013.
Measured/	measured

Calculated / Default:	
Source of data:	2011 Statistics Collections for Power Sector issued by China Electricity Council issued in 07/2012.
Value(s) of monitored parameter:	9.36%
Monitoring equipment:	
Measuring/ Reading/ Recording frequency:	Annually. In the absence of data from the relevant year, most recent figures should be used, but not older than 5 years.
Calculation method (if applicable):	-
QA/QC procedures:	-
Purpose of data:	Calculation of project emissions
Additional comment:	2011 Statistics Collections for Power Sector is most recent figures

Data / Parameter:	$TDL_{j,y}$
Unit:	
Description:	Average technical transmission and distribution losses for providing electricity to source j in year 2014.
Measured/ Calculated / Default:	measured
Source of data:	2011 Statistics Collections for Power Sector issued by China Electricity Council issued in 07/2012.
Value(s) of monitored parameter:	9.36%
Monitoring equipment:	
Measuring/ Reading/ Recording frequency:	Annually. In the absence of data from the relevant year, most recent figures should be used, but not older than 5 years.
Calculation method (if applicable):	-
QA/QC procedures:	-
Purpose of data:	Calculation of project emissions
Additional comment:	2011 Statistics Collections for Power Sector is most recent figures

Data / Parameter:	Abnormal operation of the project facility including emergencies and shut down
Unit:	h
Description:	The hours of abnormal operation of parts of project facility that can have an impact on waste energy generation and recovery
Measured/ Calculated / Default:	Operation of project facility
Source of data:	-
Value(s) of monitored parameter:	0
Monitoring equipment:	Record the abnormal operation of project facility via plant accident log, including accident and machine halt.
Measuring/ Reading/ Recording frequency:	Daily, aggregated annually
Calculation method (if applicable):	-
QA/QC procedures:	-
Purpose of data:	This parameter has to be monitored to demonstrate that no emission reduction is claimed for the hours during the abnormal operation of the

	part of project facility which have impact on waste energy generation and recovery. The abnormality can be in terms of violation of operational parameters, poor quality product, emergencies or shutdown.
Additional comment:	

Data and parameters monitored for Gold Standard sustainable development indicators

According to the requirements of the Gold Standard, the project activity must be assessed against a matrix of sustainable development indicators. Six indicators were added to the monitoring plan.

Copy Table for each indicator

No	1	
Indicator	Air quality	
Mitigation measure	Water sprinkling in the construction period Dust remove system in the operation period.	
Repeat for each parameter		
Chosen parameter	The water sprinkling record, The local residential comments through interviewing, Dust remove system operation log.	
Current situation of parameter	With the implementation of the Project, local air quality is significant improved.	
Estimation of baseline situation of parameter	In the absence of the Project, the hot red coke would be quenched by CWQ system, which would result in much pollutants emission	
Future target for parameter	Meet the requirements of air pollution emission criteria	
Way of monitoring	How	Record water sprinkling activity during the construction period for first verification. Check the dust remove system operation log. Record local residential comments on the air quality.
	When	regularly measured and aggregated for each monitoring period
	By who	Monitored by the project owner
Result	The frequency of spray water: 2 to 4 times a month. The dust remove system was effectively operated, 14997.43t dust was collected in the monitoring period. local residential give higher positive comments on the air quality improvement. The spray water record, the dust remove system operation log and the questionnaire of impact on environment and community were provided for verification.	
conclusion	In absence of the project activity, much dust and chemical pollutants such as benzene, pyrene and phenol etc., were emitted with the fog from CWQ. After the implementation of the project, the dust was effectively collected by dust remove system, and those chemical pollutants were eliminated.	

No	2	
Indicator	Water quantity	
Mitigation measure	N/A as indicator scored positive.	
Repeat for each parameter		
Chosen parameter	water consumption reduction against to the CWQ system	
Current situation of parameter	396,399t industrial water was saved by the Project. Prior to the implementation of the project, the hot red coke was quenched by using water by CWQ system, the water	

		consumption rate is 0.443t/t coke. With the implementation of the Project, the water consumption was effectively reduced.
Estimation of baseline situation of parameter		In the absence of the project, the hot red coke was quenched by using water by CWQ system, the water consumption rate is 0.443t/t coke
Future target for parameter		The quantity of water used for quenching coke will be significantly reduced.
Way of monitoring	How	the coke quenched by the project
	When	Continuously measured and aggregated for each monitoring period
	By who	Monitored by the project owner.
Result		894,805t coke were quenched by the CDQ system, the industrial water saving =894805*0.443=396,399t
conclusion		With the implementation of the project, much industrial water was saved against the WDQ system.

No		3																								
Indicator		Quality of employment																								
Mitigation measure		N/A as indicator scored positive.																								
Repeat for each parameter																										
Chosen parameter		Training of staff.																								
Current situation of parameter		The staff has accepted a series of training on the technology and the monitoring of the plant operation, and the emergency and safety procedures.																								
Estimation of baseline situation of parameter		In the baseline, local people have no such opportunities to be trained on the technology and the monitoring of the plant operation, and the emergency and safety procedures.																								
Future target for parameter		Together with the technology supplier, the Project organizes training for the staff on the technology and the monitoring of the plant operation, and the emergency and safety procedures.																								
Way of monitoring	How	The training records for all the employees																								
	When	Recorded monthly and aggregated for each monitoring period																								
	By who	Monitored by the project owner																								
Result		As per the training records of the Project, the staffs have accepted a series of training on the plant operation, Safety, emergency, and maintenance, which contributes to the quality of employment. . <table><tr><td>No</td><td>Time of the training</td><td>Training subject</td><td>Attendees</td></tr><tr><td>1</td><td>09-11/01/2013</td><td>CDQ basic</td><td>36 workers</td></tr><tr><td>2</td><td>21/01/2013</td><td>WHR boiler operation</td><td>20 worker</td></tr><tr><td>3</td><td>22/01/2013</td><td>Steam turbine-generator operation</td><td>15 workers</td></tr><tr><td>4</td><td>25/01/2013</td><td>Safe and emergency training</td><td>50 workers</td></tr><tr><td>5</td><td>10/03/2013</td><td>Safe Operation of electrical equipment</td><td>37 workers</td></tr></table>	No	Time of the training	Training subject	Attendees	1	09-11/01/2013	CDQ basic	36 workers	2	21/01/2013	WHR boiler operation	20 worker	3	22/01/2013	Steam turbine-generator operation	15 workers	4	25/01/2013	Safe and emergency training	50 workers	5	10/03/2013	Safe Operation of electrical equipment	37 workers
No	Time of the training	Training subject	Attendees																							
1	09-11/01/2013	CDQ basic	36 workers																							
2	21/01/2013	WHR boiler operation	20 worker																							
3	22/01/2013	Steam turbine-generator operation	15 workers																							
4	25/01/2013	Safe and emergency training	50 workers																							
5	10/03/2013	Safe Operation of electrical equipment	37 workers																							

	6	15-17 /04/2013	Plant operation practice	51 workers
	7	10/05/2013	Monitoring system	11 workers
	8	19/08/2013	The monitoring requirement of GS project	21 workers
	9	30/08/2013	Environment protection	54 workers
	10	28/11/2013	Safe operation	57 workers
	11	28/02/2014	Regular maintenance	57 workers
The training records and relevant certificates for employees of the Project are available on-site. The training records and relevant certificates for employees were provided to DOE for verification.				
conclusion		The staffs of the project were trained on the technology and the monitoring of the plant operation, and the emergency and safety procedures. The training not only improves the operation level of the Project, and also enhances the technical skill of the staff.		

No	4		
Indicator	Quantitative employment and income generation		
Mitigation measure	N/A as indicator scored positive.		
Repeat for each parameter			
Chosen parameter	Number of jobs created in the operations of the Project and their salary levels.		
Current situation of parameter	57 persons have been employed. Because the project owner has no experience on CDQ project operation, 3 year's guarantee period was provided by manufacturers. The repair and maintenance of the equipment will be done by the staff from manufacturers in the guarantee period. So, the number of the staff is currently less than planned in the GS Passport. After the guarantee period, the employed people will be about 80 people. The average salary of the employee was CNY 37,800/year.		
Estimation of baseline situation of parameter	In the baseline, local people have no such job opportunities from the Project, and their income has no increase. The average salary level in Neijiang City, Sichuan Province in year 2012 is CNY 31,646/year according to the Sichuan Statistical yearbook 2013, which is the most recent available data source.		
Future target for parameter	Consistency in the number of jobs created during operational period, and the salary of employees will be above the local average.		
Way of monitoring	How	HR records or report	
	When	Recorded monthly and aggregated for each monitoring period	
	By who	Monitored by the project owner.	
Result	Parameter 1: creating 57 long term work positions for local people during operational period		

	Parameter 2: The average salary of employees is 37,800CNY/y, above the local average salary level, 31,646 CNY/y, according to the Sichuan Statistical yearbook 2013, which is the most recent available data source. The payroll was provided for verification.
conclusion	With the operation of the Project, 57 long term work positions are created in the monitoring period for local people with higher salary level, which effectively improve the family income status of those employees.

No	5
Indicator	Other pollutants
Mitigation measure	(1) The construction period: The solid waste from the project during the construction period will be used as construction materials, and the remaining useless will be periodically cleaned by the sanitation department. (2) The operation period: Dust collected by the Project will be regularly transported out by trucks for comprehensive utilization. The household garbage will be regularly cleared out by sanitary department.
<i>Repeat for each parameter</i>	
Chosen parameter	Solid waste treatment
Current situation of parameter	14997.43t dust collected by the Project regularly transported for comprehensive utilization
Estimation of baseline situation of parameter	In the absence of the Project, the dust would be emitted into the air.
Future target for parameter	Dust collected by the Project will be regularly transported for comprehensive utilization
Way of monitoring	How Interviewing with on-site staff about the solid waste treatment during the construction period in first verification. Measure the quantity of the dust collected and transported for comprehensive utilization by the project.
	When Interviewing with on-site staff about the solid waste treatment in the construction period in first verification. The quantity of the dust collected and transported for comprehensive utilization by the project will be continuously measured and aggregated for each monitoring period
	By who Monitored by the project owner
Result	(1) solid waste was effectively reused and periodically cleaned by the sanitation department, no any impact on local environment and community, on-site staff and local residents give higher positive comment on solid waste treatment. (2)The quantity of the dust collected by the dust remove system of the Project is 14997.43t during the monitoring period, those dust was transported to for comprehensive utilization.
conclusion	The solid waste in construction was effectively reused and periodically cleaned by the sanitation department, no any impact on local environment and community. The dust collected was sent for comprehensive utilization to avoid potential secondary pollution.

D.3. Implementation of sampling plan

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Not applicable.

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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In accordance with the methodology ACM0012 (04.0.0), the baseline emissions are calculated with formulas below.

$$BE_y = BE_{En,y} + BE_{flst,y} \quad (1)$$

Where:

BE_y The total baseline emissions during the year y in tCO₂

$BE_{En,y}$ The baseline emissions from energy generated by the project activity during the year y in tCO₂

$BE_{flst,y}$ Baseline emissions from generation of steam, if any, using fossil fuel, that would have been used for flaring the waste gas in absence of the project activity (tCO₂e per year). As the project only involves the utilization of waste heat, hence, $BE_{flst,y} = 0$.

Therefore, $BE_y = BE_{En,y}$ (2)

As methodology ACM0012 (version 04.0.0) "Scenario-1" has been selected as the project's baseline scenario,

$BE_{En,y}$ can be calculated by the following formula:

$$BE_{En,y} = BE_{Elec,y} + BE_{Ther,y} \quad (3)$$

Where:

$BE_{Elec,y}$ Baseline emissions from electricity power during the year y (in tCO₂).

$BE_{Ther,y}$ Baseline emissions from thermal energy (due to heat generation by elemental process) during the year y (in tCO₂).

As the Project utilizes waste heat for electricity power generation only, no thermal supply involved in the project,

$BE_{Ther,y} = 0$.

Baseline emissions

$$BE_{Elec,y} = f_{cap} \times f_{wcm} \times \sum_j \sum_i (EG_{i,j,y} \times EF_{Elec,i,j,y}) \quad (4)$$

Where:

$BE_{Elec,y}$ Baseline emissions due to displacement of electricity during the year y (tCO₂)

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

$EF_{Elec,i,j,y}$ The CO₂ emission factor for the electricity source i (is for the grid, and is for an identified source), displaced due to the project activity, during the year y (tCO₂/MWh)

f_{wcm} Fraction of total electricity generated by the project activity using waste energy. This fraction is 1 if the electricity generation is purely from use of waste energy.

f_{cap} Factor that determines the energy that would have been produced in project year y using waste energy generated at a historical level, expressed as a fraction of the total energy produced using waste source in year y. The ratio is 1 if the waste energy generated in project year y is the same or less than that generated at a historical level.

Since the electricity supply of identified baseline scenario come from CCPG, and the project only involves the utilization of waste heat, hence, formula (4) changes to:

$$BE_{Elec,y} = f_{cap} \times f_{wcm} \times EG_{PJ,y} \times EF_{grid,CM,y} \quad (5)$$

Where:

$EG_{PJ,y}$ Quantity of net electricity supply for captive use as a result of the implementation of the project activity in year y (MWh);

$EF_{grid,CM,y}$ Combined Margin CO2 emission factor in year y in CCPG (tCO₂/MWh);

$EF_{grid,CM,y}$ was calculated ex-ante and will not be changed during the monitoring period. As per the registered PDD of the Project, the value is 0.7338 tCO₂/MWh.

The calculation for BE_y was listed in Table 2 as following:

Table 2 . BE_y Calculation

Period	$EG_{PJ,y}$ measured by M2 (MWh)	$EF_{grid,CM,y}$ (tCO ₂ /MWh)	BE_y (tCO ₂)
	(1)	(2)	(3)=(1)*(2)
13/05/2013-16/05/2013	760.6	0.7338	558.13
17/05/2013-23/05/2013	1688.4	0.7338	1238.95
24/05/2013-30/05/2013	1882.1	0.7338	1381.08
31/05/2013-06/06/2013	2254.5	0.7338	1654.35
07/06/2013-13/06/2013	1942.5	0.7338	1425.41
14/06/2013-20/06/2013	2416.9	0.7338	1773.52
21/06/2013-27/06/2013	3841.1	0.7338	2818.6
28/06/2013-04/07/2013	2421.8	0.7338	1777.12
05/07/2013-11/07/2013	3188.1	0.7338	2339.43
12/07/2013-18/07/2013	3738.2	0.7338	2743.09
19/07/2013-25/07/2013	4158.7	0.7338	3051.65
26/11/2013-01/08/2013	2954.8	0.7338	2168.23
02/08/2013-08/08/2013	2627.1	0.7338	1927.77
09/08/2013-15/08/2013	2949.9	0.7338	2164.64
16/08/2013-22/08/2013	4273.1	0.7338	3135.6
23/08/2013-29/08/2013	3670.4	0.7338	2693.34
30/08/2013-05/09/2013	4106.1	0.7338	3013.06
06/09/2013-12/09/2013	3853.8	0.7338	2827.92
13/09/2013-19/09/2013	4124.5	0.7338	3026.56
20/09/2013-26/09/2013	4328.3	0.7338	3176.11
27/09/2013-03/10/2013	3216.75	0.7338	2360.45
04/10/2013-10/10/2013	4216.85	0.7338	3094.32
11/10/2013-17/10/2013	4183	0.7338	3069.49
18/10/2013-24/10/2013	4077.35	0.7338	2991.96
25/10/2013-31/10/2013	3739.8	0.7338	2744.27
01/11/2013-07/11/2013	3377.15	0.7338	2478.15
08/11/2013-14/11/2013	4147.8	0.7338	3043.66
15/11/2013-21/11/2013	2709.8	0.7338	1988.45
22/11/2013-28/11/2013	4094.95	0.7338	3004.87
29/11/2013-05/12/2013	3994.8	0.7338	2931.38
06/12/2013-12/12/2013	3873.1	0.7338	2842.08
13/12/2013-19/12/2013	3652.45	0.7338	2680.17

20/12/2013-26/12/2013	3956.75	0.7338	2903.46
27/12/2013-31/12/2013	3189.7	0.7338	2340.68
Total in 2013	113611.15	0.7338	83367
01/01/2014-09/01/2014	3691.85	0.7338	2709.08
10/01/2014-16/01/2014	3338.85	0.7338	2450.05
17/01/2014-23/01/2014	4082.75	0.7338	2995.92
24/01/2014-30/01/2014	2879.25	0.7338	2112.79
31/01/2014-06/02/2014	0	0.7338	0
07/02/2014-13/02/2014	6195.45	0.7338	4546.22
14/02/2014-20/02/2014	4060.95	0.7338	2979.93
21/02/2014-27/02/2014	4171.4	0.7338	3060.97
28/02/2014-06/03/2014	3856.45	0.7338	2829.86
07/03/2014-09/03/2014	1599.05	0.7338	1173.38
Total in 2014	33,876	0.7338	24858

From 13/05/2013 to 09/03/2014, the monitoring period covers 301days:

$$Q_{OE,y} = 155,510 \text{ MWh}$$

$$Q_{OE,BL} = 254,368.7999 \times 301 \div 365 = 209,767.1473 \text{ MWh}$$

So $Q_{OE,y}$ is smaller than the $Q_{OE,BL}$, and the f_{cap} was 1 according to ACM0012.

E.2. Calculation of project emissions or actual net GHG removals by sinks

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Project Emissions include emissions due to (1) combustion of auxiliary fuel to supplement waste gas/heat and (2) electricity emissions due to consumption of electricity for cleaning of gas before being used for generation of energy or other supplementary electricity consumption.

$$PE_y = PE_{AF,y} + PE_{EL,y} \quad (6)$$

Where:

PE_y Project emissions due to the project activity (tCO₂)

$PE_{AF,y}$ Project activity emissions from on-site consumption of fossil fuels by the unit process(es) and/or co-generation plant(s) if they are used as supplementary fuels due to non-availability of waste energy to the project activity or due to any other reason (tCO₂). For the project, $PE_{AF,y} = 0$

$PE_{EL,y}$ Project activity emissions from on-site consumption of electricity for gas cleaning equipment or other supplementary electricity consumption (tCO₂).

$$PE_y = PE_{EL,y} \quad (7)$$

According to Tool to calculate baseline, project and/or leakage emissions from power consumption Version 01, the project emission from power consumption is the following:

$$PE_{EL,y} = \sum_j EC_{PJ,j,y} \times EF_{EL,j,y} \times (1 + TDL_{j,y}) \quad (8)$$

$PE_{EL,y}$ is the project emissions from consumption of power in gas cleaning equipment of project activity or other supplementary project power consumption (t CO₂/yr)

$EC_{PJ,j,y}$ is the additional power consumed in year y as a result of the implementation of the project activity source j

(MWh)

$EF_{EL,i,y}$ Emission factor for power generation for source j in year y (tCO₂/MWh), in this case it is grid emission factor of Central China Grid.

$TDL_{i,y}$ Average technical transmission and distribution losses for providing power to the project by the Sichuan Power Grid (the sub-power grid of the CCPG, where the project is sited in) in year y. so, 9.36% from 2011 Statistics Collections for Power Sector issued by China Electricity Council issued in 07/2012 has been adopted.

The emission reduction (ER_y) during a given year y is calculated as follows:

$$ER_y = BE_y - PE_y \quad (9)$$

The calculation for PE_y was listed as following:

Table 3 . PE_y Calculation

Period	$EC_{PJ,i,y}$ measured by M3 (MWh)	$TDL_{i,y}$	PE_y
	(4)	(5)	(6)=(4)*(1+(5))*(2)
13/05/2013-16/05/2013	19.668	9.36%	15.78
17/05/2013-23/05/2013	50.259	9.36%	40.33
24/05/2013-30/05/2013	75.661	9.36%	60.72
31/05/2013-06/06/2013	76.132	9.36%	61.09
07/06/2013-13/06/2013	101.359	9.36%	81.34
14/06/2013-20/06/2013	97.776	9.36%	78.46
21/06/2013-27/06/2013	110.6	9.36%	88.75
28/06/2013-04/07/2013	76.659	9.36%	61.52
05/07/2013-11/07/2013	86.347	9.36%	69.29
12/07/2013-18/07/2013	128.912	9.36%	103.45
19/07/2013-25/07/2013	120.683	9.36%	96.85
26/11/2013-01/08/2013	90.996	9.36%	73.02
02/08/2013-08/08/2013	90.438	9.36%	72.58
09/08/2013-15/08/2013	90.444	9.36%	72.58
16/08/2013-22/08/2013	510.185	9.36%	409.42
23/08/2013-29/08/2013	345.274	9.36%	277.08
30/08/2013-05/09/2013	427.984	9.36%	343.45
06/09/2013-12/09/2013	302.818	9.36%	243.01
13/09/2013-19/09/2013	377.984	9.36%	303.33
20/09/2013-26/09/2013	374.679	9.36%	300.67
27/09/2013-03/10/2013	279.497	9.36%	224.29
04/10/2013-10/10/2013	438.259	9.36%	351.7
11/10/2013-17/10/2013	355.996	9.36%	285.68
18/10/2013-24/10/2013	377.297	9.36%	302.77
25/10/2013-31/10/2013	430.574	9.36%	345.53
01/11/2013-07/11/2013	413.78	9.36%	332.05
08/11/2013-14/11/2013	419.313	9.36%	336.49
15/11/2013-21/11/2013	283.72	9.36%	227.68
22/11/2013-28/11/2013	435.392	9.36%	349.39
29/11/2013-05/12/2013	427.33	9.36%	342.93
06/12/2013-12/12/2013	386.96	9.36%	310.53
13/12/2013-19/12/2013	339.997	9.36%	272.84
20/12/2013-26/12/2013	310.287	9.36%	249

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27/12/2013-31/12/2013	305.407	9.36%	245.08
Total in 2013	8758.667	9.36%	7029
01/01/2014-09/01/2014	275.437	9.36%	221.03
10/01/2014-16/01/2014	286.212	9.36%	229.68
17/01/2014-23/01/2014	376.998	9.36%	302.53
24/01/2014-30/01/2014	310.445	9.36%	249.13
31/01/2014-06/02/2014	0	9.36%	0
07/02/2014-13/02/2014	478.503	9.36%	383.99
14/02/2014-20/02/2014	395.049	9.36%	317.02
21/02/2014-27/02/2014	451.242	9.36%	362.11
28/02/2014-06/03/2014	389.476	9.36%	312.55
07/03/2014-09/03/2014	191.220	9.36%	153.45
Total in 2014	3154.582	9.36%	2532

The calculation for ER_y was listed as following:

Period	BE_y (tCO ₂)	PE_y (tCO ₂)	ER_y (tCO ₂)
	(3)=(1)*(2)	(6)=(4)*(1+(5))*(2)	(7)=(3)-(6)
13/05/2013-16/05/2013	558.13	15.78	542.35
17/05/2013-23/05/2013	1238.95	40.33	1198.62
24/05/2013-30/05/2013	1381.08	60.72	1320.36
31/05/2013-06/06/2013	1654.35	61.09	1593.26
07/06/2013-13/06/2013	1425.41	81.34	1344.07
14/06/2013-20/06/2013	1773.52	78.46	1695.06
21/06/2013-27/06/2013	2818.6	88.75	2729.85
28/06/2013-04/07/2013	1777.12	61.52	1715.6
05/07/2013-11/07/2013	2339.43	69.29	2270.14
12/07/2013-18/07/2013	2743.09	103.45	2639.64
19/07/2013-25/07/2013	3051.65	96.85	2954.8
26/11/2013-01/08/2013	2168.23	73.02	2095.21
02/08/2013-08/08/2013	1927.77	72.58	1855.19
09/08/2013-15/08/2013	2164.64	72.58	2092.06
16/08/2013-22/08/2013	3135.6	409.42	2726.18
23/08/2013-29/08/2013	2693.34	277.08	2416.26
30/08/2013-05/09/2013	3013.06	343.45	2669.61
06/09/2013-12/09/2013	2827.92	243.01	2584.91
13/09/2013-19/09/2013	3026.56	303.33	2723.23
20/09/2013-26/09/2013	3176.11	300.67	2875.44
27/09/2013-03/10/2013	2360.45	224.29	2136.16
04/10/2013-10/10/2013	3094.32	351.7	2742.62
11/10/2013-17/10/2013	3069.49	285.68	2783.81
18/10/2013-24/10/2013	2991.96	302.77	2689.19
25/10/2013-31/10/2013	2744.27	345.53	2398.74
01/11/2013-07/11/2013	2478.15	332.05	2146.1
08/11/2013-14/11/2013	3043.66	336.49	2707.17
15/11/2013-21/11/2013	1988.45	227.68	1760.77
22/11/2013-28/11/2013	3004.87	349.39	2655.48
29/11/2013-05/12/2013	2931.38	342.93	2588.45
06/12/2013-12/12/2013	2842.08	310.53	2531.55
13/12/2013-19/12/2013	2680.17	272.84	2407.33
20/12/2013-26/12/2013	2903.46	249	2654.46
27/12/2013-31/12/2013	2340.68	245.08	2095.6
Total in 2013	83367	7045	76338

01/01/2014-09/01/2014	2709.08	221.03	2488.05
10/01/2014-16/01/2014	2450.05	229.68	2220.37
17/01/2014-23/01/2014	2995.92	302.53	2693.39
24/01/2014-30/01/2014	2112.79	249.13	1862.66
31/01/2014-06/02/2014	0	0	0
07/02/2014-13/02/2014	4546.22	383.99	4162.01
14/02/2014-20/02/2014	2979.93	317.02	2662.91
21/02/2014-27/02/2014	3060.97	362.11	2698.86
28/02/2014-06/03/2014	2829.86	312.55	2517.31
07/03/2014-09/03/2014	1173.38	153.45	1019.93
Total in 2014	24858	2532	22,326

E.3. Calculation of leakage

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As per the methodology ACM0012 (version 04.0.0), no leakage needs to be considered in the project, $LE_y = 0$ tCO₂e.

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

Item	Baseline emissions or baseline net GHG removals by sinks (t CO ₂ e)	Project emissions or actual net GHG removals by sinks (t CO ₂ e)	Leakage (t CO ₂ e)	Emission reductions or net anthropogenic GHG removals by sinks (t CO ₂ e)
2013	83,367	7,029	0	76,338
2014	24,858	2,532	0	22,326
Total	108,225	9,561	0	98,664

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
(1) Emission reductions or GHG removals by sinks (t CO₂e)	126,525	98,664

*The estimated annual emission reductions are 153,428tCO₂e as per registered PDD. The monitoring period covers 301days, $153,428 \times 301 / 365 = 126,525$ tCO₂e.

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

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The actual emission reductions generated in the monitoring period are 98,664 tCO₂e, which are 22.03% less than the estimated emission reductions in the registered PDD.

E.7. Actual emission reductions or net anthropogenic GHG removals by sinks during the first commitment period and the period from 1 January 2013 onwards.

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Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
03.2	5 November 2013	Editorial revision to correct table in page 1.
03.1	2 January 2013	Editorial revision to correct table in section E.5.
03.0	3 December 2012	Revision required to introduce a provision on reporting actual emission reductions or net anthropogenic GHG removals by sinks for the period up to 31 December 2012 and the period from 1 January 2013 onwards (EB70, Annex 11).
02.0	13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).
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