Monitoring report form (Version 03.2)

Monitoring report

Title of the project activity	Shenmu County Derun Carbonaceous Reductant Co., Ltd. Semi-coke Waste Gas Power Generation Project
Reference number of the project activity	Ref. 7309
Version number of the monitoring report	Version 1.0
Completion date of the monitoring report	03/03/2014
Registration date of the project activity	09/10/2012
Monitoring period number and duration of this monitoring period	1st monitoring period, from 09/10/2012 to 31/01/2014
Project participant(s)	Shenmu County Derun Carbonaceous Reductant Co., Ltd.
Host Party(ies)	People's Republic of China
Sectoral scope(s) and applied methodology(ies)	Sectoral scope 1: Energy Industries and Scope 4, Manufacture Industry ACM0012 "Consolidated baseline methodology for GHG emission reductions from waste energy recovery projects" Version 4.0.0
Estimated amount of GHG emission reductions or net anthropogenic GHG removals by sinks for this monitoring period in the registered PDD	322,702
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period	292,573
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved during the period up to 31 December 2012(if applicable)	51,394
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved during the period from 1 January 2013 onwards (if applicable).	241,179

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

>> Shenmu County Derun Carbonaceous Reductant Co., Ltd. Semi-coke Waste Gas Power Generation Project (hereinafter referred as "the proposed project" or "the project activity") which is invested by Shenmu County Derun Carbonaceous Reductant Co., Ltd. (hereinafter referred to as "Derun Company") and Shenmu County Hengrun Coal Chemical Co., Ltd (hereinafter referred to as "Hengrun Company"), is located in the Yanjiata Industry Zone of Shenmu County, Shaanxi Province.

Derun Company has an existing semi-coke production facility with the output of 800kt/y and Hengrun Company has an existing semi-coke production facility with the output of 600kt/y. The rated production capacity of the semi-coke facilities in the Derun Company and Hengrun Company is 1400kt/a, and the annual waste gas from the two companies is about $7.7\times10^8 Nm^3$. During the low-temperature retorting process of semi-coke production, a lot of semi-coke gas was generated and flared and released to the atmosphere through the torch without any pre-treatment, and the electricity consumption for the semi-coke facilities were provided by the Northwest China Power Grid before the implementation of the project activity. The purpose of the project is to recover waste gas from the process of semi-coke production of Derun Company and Hengrun Company for electricity generation, which will be delivered to Northwest China Power Grid. The Northwest China Power Grid is dominated by fossil fuel-fired power plants. Thus, the implementation of the project activity helps to reduce the greenhouse gas (CO_2) Emissions.

Hengrun Company has authorized Derun Company as the representative to construct and manage the project activity. The proposed project activity involves installation of two 130t/h gas-fired boilers, two 30MW condensing steam turbines with two 30MW generators each, with expected 6,000 operating hours per year. The waste gas from process of semi-coke is transformed into steam in two gas-fired boilers and generates power by two condensing steam turbines & generators. The electricity generated will be supplied to the Northwest China Power Grid through the local grid. Thus, the implementation of the project activity will supply 309.6GWh electricity to the Northwest China Power Grid per year, resulting in estimated emission reductions of 245,388tCO_2e.

The construction of the project activity was started in 2011. And the project activity was put into commercial operation on October 9th 2012. During the first monitoring period (09/10/2012 – 31/01/2014), the total emission reductions achieved is: 292,573 tCO_2e.

A.2. Location of project activity

>> The project activity is located in the Yanjiata Industry Zone, Sunjiacha Town, Shenmu County, Shaanxi Province, P. R. China. The latitude is N39°7'52.8'', and the longitude is E110°20'30.7''. The maps below show the location of the project activity.

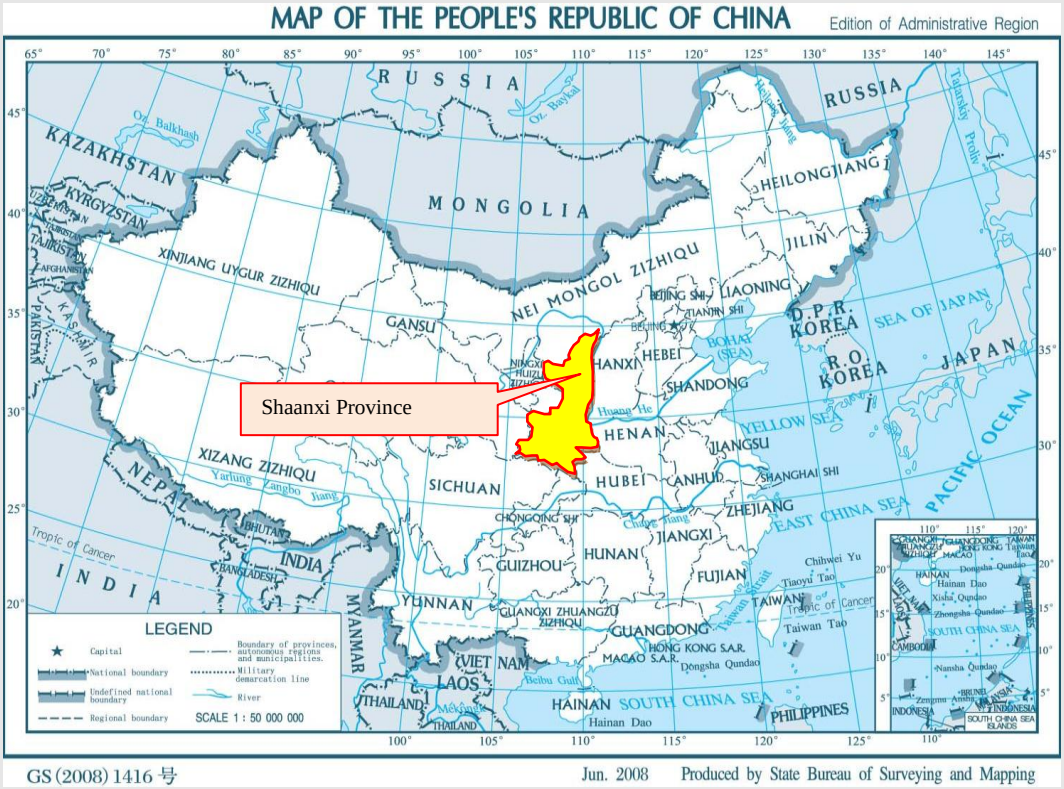


Figure A.1 The location of the Shaanxi Province in China

Figure A.2 The location of the project in Shenmu County

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)	Shenmu County Derun Carbonaceous Reductant Co., Ltd. (private entity)	No

A.4. Reference of applied methodology

>>

Approved consolidated baseline and monitoring methodology ACM0012 "*Consolidated baseline methodology for GHG emission reductions from waste energy recovery projects*" *Version 4.0*.0
http://cdm.unfccc.int/methodologies/DB/L731WMCXLT0WE6ALG5AYAGLTJP7KW7

The "*Tool to calculate the emission factor for an electricity system*" (Version 2.2.1)
http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v2.2.1.pdf

The "*Tool for the demonstration and assessment of additionality (version 06.0)*"
http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v06.0.pdf

The "Tool to determine the baseline efficiency of thermal or electric energy generation systems"
http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-09-v1.pdf

The "Tool to determine the remaining lifetime of equipment"
http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-10-v1.pdf

The "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion"
http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-03-v2.pdf

References can be found at:
http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html

A.5. Crediting period of project activity

>>

The fixed crediting period is adopted by the project activity. And the crediting period of the project activity is from 09/10/2012 to 08/10/2022.

SECTION B. Implementation of project activity

B.1. Description of implemented registered project activity

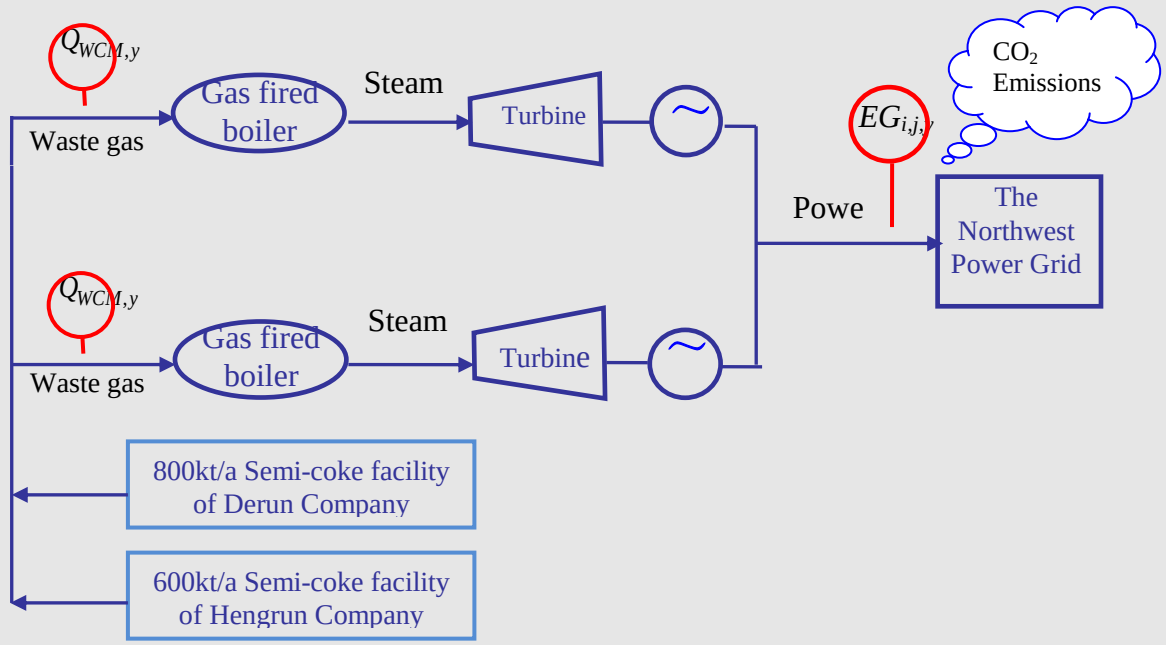
>>

The project activity consists of one site and has been implemented as described in the registered PDD. The start date of the project activity is 20/12/2011, when the Engineering Procurement and Construction Contract was signed. The project activity was put into commercial operation on October 9th 2012. During this monitoring period, there are no events or situations that occurred which may impact the applicability of the methodology.

The project recovers the waste gas from semi-coke production for power generation and the electricity generated is sold to the Northwest China Power Grid. The project activity involves the

installation of two 130t/h gas-fired boilers, two 30MW condensing turbines & generators

The main process of the project activity can be seen in following figure:



Key technical indicators of the boiler, turbine and generator are listed in the following table.

Table key technical indicators of the main equipments

	Boiler	Turbine	Generator
	Model Type: UG-130/9.8-Q Rated steam generation capacity: 130 t/h Rated steam pressure: 9.8MPa Rated steam temperature: 540℃	Model type: NZK30-8.83 Rated power: 30MW Intake steam temperature: 535℃ Intake steam pressure:8.83 MPa	Model type: QFW-30-2C Rated power: 30MW Rated rotating velocity:3000r/min

B.2. Post registration changes

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

>>

N/A

B.2.2. Corrections

>>

N/A

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

>>

N/A

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

>>

N/A

B.2.5. Changes to start date of crediting period

>>

N/A

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

>>

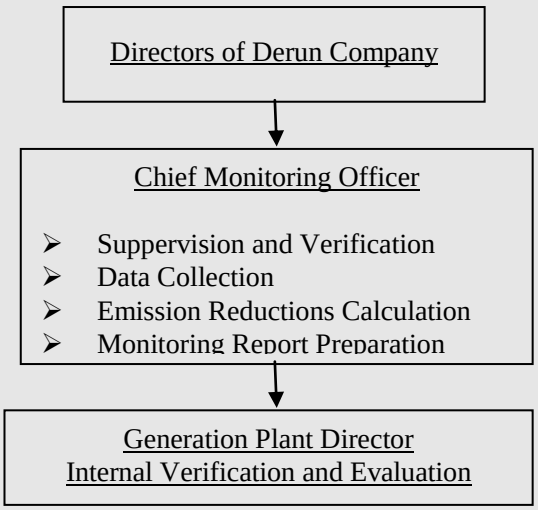
N/A

SECTION C. Description of monitoring system

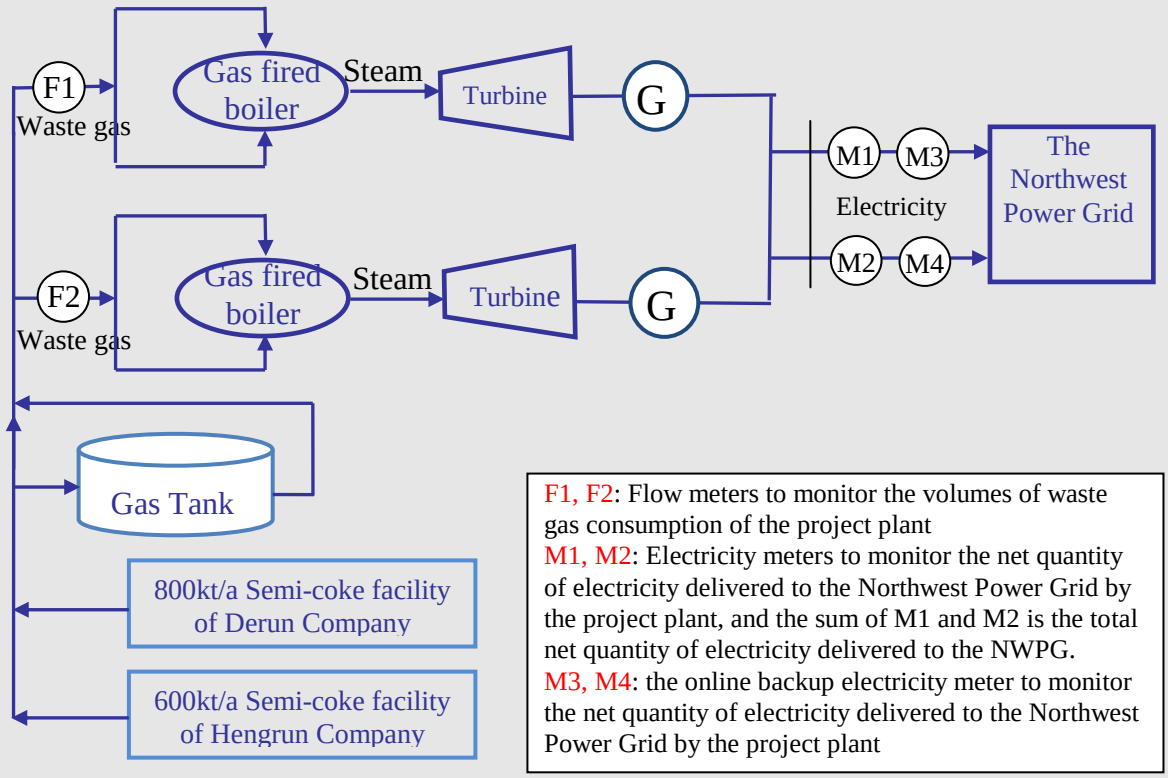
>>

Organizational structure, roles and responsibilities of personnel:

A chief monitoring officer will be appointed by Derun Company who will take charge of the supervision and verification of the measurement and data collection (meter reading, sales receipts), calculate emission reductions and prepare a monitoring report.



Monitoring Equipment and program:



F1, F2: Flow meters to monitor the volumes of waste gas consumption of the project plant
M1, M2: Electricity meters to monitor the net quantity of electricity delivered to the Northwest Power Grid by the project plant, and the sum of M1 and M2 is the total net quantity of electricity delivered to the NWPG.
M3, M4: the online backup electricity meter to monitor the net quantity of electricity delivered to the Northwest Power Grid by the project plant

Monitoring system:

1.Electricity monitoring

Electricity meters are installed to measure the net quantity of electricity supplied to Northwest China Power Grid. Bi-directional meters M1 and M2 are installed at the substation to measure the electricity supplied to the grid by the project activity and the electricity consumption by the proposed project activity from the grid, which are the main electricity meters for emission reduction calculation. Bi-directional meters M3 and M4 are the online backup electricity meters to monitor the net quantity of electricity delivered to the Northwest Power Grid by the project plant.

2.Waste Gas monitoring

Meter F1 is installed at the entrance to the #1 gas fired boiler to measure the quantity of waste gas that supplies for the #1 turbine generator for power generation. Meter F2 is installed at the entrance to the #2 gas fired boiler to measure the quantity of waste gas that supplies for the #2 turbine generator for power generation.

Data generation, aggregation, recording, calculation and reporting:

The site operators are in charge of reading and recording the meters, and the accumulated data on electricity meters and gas flow meters are recorded per month and aggregated into monthly report. The monthly report is checked and the emission reductions are calculated by CDM project manager. The electricity sales receipts or invoices are used for crosscheck. The records will be kept for two years after the end of the crediting period or the last issuance of CERs.

Emergency procedures for the monitoring system:

When main meters are out of service, calibrated backup meters are to be used and the data in the malfunction period measured by backup meters are used to calculate the emission reduction. The starting time and the ending time will be recorded carefully; and the report needs to be archived

and provided to DOE.

When the waste gas provision is paused and the starting and ending time will be recorded carefully and the emission reductions during this period will not be included.

During this monitoring period, no emergency situations happened.

SECTION D. Data and parameters

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

Data / Parameter:	$Q_{WCM,BL}$
Unit:	Nm^3 at NTP
Description:	Average quantity of WECM released in atmosphere in three years prior to the start of the project activity
Source of data:	Manufacturer's specifications
Value(s) applied):	Quantity of waste gas generated in absence of the implementation of the project is $7.7\times10^8 Nm^3$.
Purpose of data:	The data is used for baseline emission calculation.
Additional comment:	

Data / Parameter:	$Q_{BL,product}$
Unit:	Tons/yr
Description:	Production associated with the relevant waste energy generation as it occurs in the baseline scenario. The minimum of the following two figures should be used: (1) historical production data from start-up, if plant operational history is less than three years, of the plant or (2) the most relevant manufacture's data for normal operating conditions. In case of new facilities or where data is not available the manufacture's data for normal operating conditions shall be used.
Source of data:	Manufacture's data
Value(s) applied):	1400,000
Purpose of data:	The data is used for baseline emission calculation.
Additional comment:	For this project activity, the manufacture's data for normal operating conditions is used.

Data / Parameter:	$q_{wcm,product}$
Unit:	Nm^3/Ton
Description:	Specific waste gas production per unit of product (departmental or plant product which most logically relates to waste gas generation) generated as per manufacturer's or external expert's data. This parameter should be analyzed for each modification in process which can potentially impact the waste gas quantity.
Source of data:	Manufacture's data
Value(s) applied):	550
Purpose of data:	The data is used for baseline emission calculation.
Additional comment:	For this project activity, the manufacturer's data is used.

Data / Parameter:	$EF_{ELec,i,j,y}$
Unit:	tCO_2/MWh
Description:	CO_2 emission factor of the Northwest China Power Grid, displaced due to the project activity, during the year *y*.
Source of data:	Data issued by China's DNA in 2012
Value(s) applied):	0.7926
Purpose of data:	The data is used for baseline emission calculation.
Additional comment:	Official Data

D.2. Data and parameters monitored

Data / Parameter:	$Q_{WCM,y}$
Unit:	Nm^3 at NTP
Description:	Quantity of waste gas used for energy generation during year y
Measured/Calculated /Default:	Measured
Source of data:	Meter records
Value(s) of monitored parameter:	$80880.81*10^4$
Monitoring equipment:	Flow meter
Measuring/Reading/Recording frequency:	Continuous measurement, monthly recording.
Calculation method (if applicable):	The value is the sum of data on the meter F1 and F2
QA/QC procedures:	Flow Meter will be calibrated periodically according to relative national standards and regulations. And the accuracy level of the flow meters shall also meet the requirement of the relevant national standards or regulations.
Purpose of data:	The data is used for baseline emission calculation.
Additional comment:	

Meter	F1	F2
Type	LUGB-3380021320B	LUGB-3380021320B
Accuracy	1.0	1.0
Serial number	130445	130402
Calibration frequency	annual	annual
Calibration date and validity	Calibration: 27/09/2012 validity: to; 26/09/2017 Calibration: 25/09/2013 validity: to 24/09/2018	
Calibrated by Shaanxi Institute of Metrology according to the technical standard (JJG835-1993).		

Data / Parameter:	$EG_{i,j,y}$
Unit:	MWh
Description:	Quantity of electricity (which is the difference of the quantity of the electricity upload and the electricity download) supplied by the project activity during the year y in MWh.
Measured/Calculated /Default:	Measured
Source of data:	Meter records
Value(s) of monitored parameter:	369131.9
Monitoring equipment:	Gateway meter

Meter	M1	M2	M3	M4
	Main meter		Backup meter	
Type	DTSD2815	DTSD2815	DTSD2815	DTSD2815
Accuracy class	0.5s	0.5s	0.5s	0.5s
Serial number	DN003375	DN003377	DN003376	DN003378
Calibration frequency	annual	annual	annual	annual
Calibration date and validity	Calibration:24/09/2012 validity: to 23/09/2017; Calibration:23/09/2013 validity: to 22/09/2018;			
Calibration entity	Calibrated by Yulin Electricity Supply Company Energy Metering Center according to the technical standard (JJG596-1999)			

Measuring/Reading/Recording frequency:	Measured continuously, aggregated monthly
Calculation method (if applicable):	The difference of the quantity of the electricity supplied and the electricity imported of the meter (M1+M2).
QA/QC procedures:	The electricity meter will undergo maintenance/calibration to the national relative power industry standards. Electricity meters will be calibrated by Qualified institution or entity once every year and calibration documents will be kept by Derun company.
Purpose of data:	The data is used for baseline emission calculation.
Additional comment:	

D.3. Implementation of sampling plan

>>

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

>>

According to the methodology and registered PDD, the baseline emissions calculation is:

$$BE_y = f_{cap} * f_{wcm} * \sum_j \sum_i \left(EG_{i,i,y} * EF_{Elec,i,j,y} \right)$$

Where:

BE_y	The total baseline emissions during the year y in tCO_2
$EG_{i,j,y}$	Is the quantity of electricity supplied to the recipient *j* by generator, which in the absence of the project activity would have been sourced from i^{th} source (i can be either grid or identified source) during the year *y* in MWh,
$EF_{Elec,i,j,y}$	Is the CO_2 emission factor for the electricity source *i* (*i*=gr (grid) or *i*=is (identified source)), displaced due to the project activity, during the year *y* in tons CO_2/MWh
f_{wcm}	Fraction of total electricity generated by the project activity using waste gas. This fraction is 1 if the electricity generation is purely from use of waste gas. If the boiler providing steam for electricity generation uses both waste and fossil fuels, this factor is estimated using equation (1d). If the steam used for generation of the electricity is produced in dedicated boilers but supplied through common header, this factor is estimated using equation (1d/1e). NOTE: For project activity using waste pressure to generate electricity, electricity generated from waste pressure use should be measurable and this fraction is 1.
f_{cap}	Energy that would have been produced in project year *y* using waste gas/heat generated in base year expressed as a fraction of total energy produced using waste gas in year *y*. The ratio is 1 if the waste gas/heat/pressure generated in project year *y* is same or less then that generated in base year. The value is estimated using equation (1f) or (1g) and (1g-1).

Calculation o f f_{WCM}

Since the fuel used in the project activity is purely waste gas and there is no fossil fuels involved, f_{WCM} equals to 1.

Calculation of f_{cap}

As described in the registered PDD, method 2 is used in the project activity.

From	To	Flow Meter F1($10^4 Nm^3$)	Flow Meter F2($10^4 Nm^3$)	Total waste gas used for electricity generation($10^4 Nm^3$)
09/10/2012	31/10/2012	1975.01	1969.93	3944.940
01/11/2012	30/11/2012	2567.95	2569.06	5137.010
01/12/2012	31/12/2012	2589.71	2595.56	5185.270
01/01/2013	31/01/2013	2602.93	2581.23	5184.160
01/02/2013	28/02/2013	2409.50	2414.84	4824.340
01/03/2013	31/03/2013	2510.40	2486.30	4996.700
01/04/2013	30/04/2013	2591.99	2382.07	4974.060
01/05/2013	31/05/2013	2685.44	2668.99	5354.430
01/06/2013	30/06/2013	2571.34	2582.09	5153.430
01/07/2013	31/07/2013	2668.19	2676.90	5345.090
01/08/2013	31/08/2013	2684.72	2673.67	5358.390
01/09/2013	30/09/2013	2327.39	2331.90	4659.290
01/10/2013	31/10/2013	2684.42	2670.94	5355.360
01/11/2013	30/11/2013	2591.21	2570.91	5162.120
01/12/2013	31/12/2013	2570.72	2588.74	5159.460
01/01/2014	31/01/2014	2546.39	2540.37	5086.760

During this monitoring period, 80880.81*10^4 Nm^3 waste gas was consumed within 480 days. Hence f_{cap} is calculated as below:

$$f_{cap} = \frac{Q_{WCM,BL}}{Q_{WCM,y}} = \frac{7.7*10^8/365*480}{8.088081*10^8} = \frac{10.1260274}{8.088081}$$ =1.25 >1, according to methodology, f_{cap} =1.

The net electricity supplied by the project activity

As described in the registered PDD, the net electricity supplied by the project activity is the difference of the quantity of the electricity supplied and the electricity imported of the meter M1 and M2:

From	To	Electricity supplied to the grid by the project(MWh)	Electricity imported from the grid by the project(MWh)	Net Electricity supplied ($EG_{i,j,y}$ MWh)
09/10/2012	31/10/2012	18030.90	493.30	17537.60
01/11/2012	30/11/2012	23621.30	0.00	23621.30
01/12/2012	31/12/2012	23683.40	0.00	23683.40
01/01/2013	31/01/2013	23824.50	0.00	23824.50
01/02/2013	28/02/2013	22149.30	0.00	22149.30
01/03/2013	31/03/2013	22689.80	0.00	22689.80
01/04/2013	30/04/2013	22888.50	0.00	22888.50
01/05/2013	31/05/2013	24475.80	0.00	24475.80
01/06/2013	30/06/2013	23592.40	0.00	23592.40
01/07/2013	31/07/2013	24406.80	0.00	24406.80
01/08/2013	31/08/2013	24352.60	0.00	24352.60
01/09/2013	30/09/2013	21292.00	249.00	21043.00
01/10/2013	31/10/2013	24398.50	0.00	24398.50
01/11/2013	30/11/2013	23591.60	0.00	23591.60
01/12/2013	31/12/2013	23607.80	0.00	23607.80
01/01/2014	31/01/2014	23269.00	0.00	23269.00
Total		369874.20	742.30	369131.90

Thus the net electricity supply 369131.9 MWh is used in the baseline emissions calculation.

$$BE_y = f_{cap} * f_{wcm} * \sum_j \sum_i \left(EG_{i,i,y} * EF_{Elec,i,j,y}\right)$$= 1*1* 369131.9 * 0.7926

= 292,573 tCO_2e

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

>>

According to the registered PDD and methodology, project emissions involved in the project boundary are caused by the electricity imported from the grid. Since the electricity imported from the grid has been considered and subtracted in the baseline emissions calculation, the project emissions due to electricity consumption as a result of the project activity needn't to be taken into account in this step. And no other project emissions are involved in the project boundary; therefore, project emissions are zero.

E.3. Calculation of leakage

>>

In accordance with ACM0012, no leakage is considered. The leakage from the project is zero.

Ly = 0

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_2e)	Project emissions or actual net GHG removals by sinks (t CO_2e)	Leakage (t CO_2e)	Emission reductions or net anthropogenic GHG removals by sinks (t CO_2e)
Total	292,573	0	0	292,573

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 (t CO_2e)	322,702	292,573

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

>>

Since the actual value reached during the monitoring period is less than the ex-ante calculation of the registered PDD, no explanation is need according to the monitoring report guideline.

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

Item	Actual values achieved up to 31 December 2012	Actual values achieved from 1 January 2013 onwards
Emission reductions or GHG removals by sinks (t CO_2e)	51,394	241,179

- - - - -

Document information

Version	*Date*	*Description*
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).
01	28 May 2010	EB 54, Annex 34. Initial adoption.

Decision Class: Regulatory
Document Type: Form
Business Function: issuance
Keywords: monitoring report, performance monitoring