

UNFCCC Clean Development Mechanism Monitoring Report: VCS Claim

Zhang Jiagang waste heat recovery from sulphuric acid production
for electricity generation project

CDM registration number: 1685

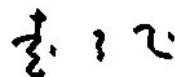
Monitoring period: 28 March 2006 to 18 December 2008

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It is the first VCS verification of the project.

The person who is in charge of this Monitoring Report:

A handwritten signature in black ink, consisting of stylized Chinese characters, likely representing Zhang Jiagang.

1. Project background

The Zhang Jiagang waste heat recovery from sulphuric acid production for electricity generation project has been registered as a CDM project by the UNFCCC as on 19 December, 2008. The purpose of this first Monitoring Report (MR) is to claim Verified Emission Reductions (VERs) generated by the Project Activity from 28 March, 2006 to the day before the date of registration; known as pre-registration VERs.

Further background on this project activity can be found in the PDD and associated documents, which are available on the UNFCCC website:

<http://cdm.unfccc.int/Projects/DB/DNV-CUK1204688345.63/view>

The project developer and operator is Twolions (Zhang Jiagang) fine chemicals Co., Ltd

2. Monitoring background

The calculation of emission reductions is based on the monitoring plan in the Project Design Document. The calculation of emission reduction applies methodologies ACM0004:

“Consolidated baseline methodology for waste gas and/or heat and/or pressure for power generation”, Version 02, 03 March 2006, in valid from 03 March 2006 to 05 July 2007.

3. Project Description

The project activity is located in the Jiangsu Yangtze River International Chemistry Park, which is 20km distance from downtown Zhang Jiagang, Suzhou city in Jiangsu Province. The geographical coordinate of the centre of project site is: East Longitude 120°27'52", North Latitude 32°00'10". The purpose of the project activity is to recover waste heat from sulphuric acid production process to produce electricity, displacing part of electricity supplied by the East China Grid which predominantly relies on fossil fuel-fired power plants for power generation. The project activity involves installation of Monsanto Heat Recovery System (HRS), which is created by MECS in USA, and Siemens condensing turbine and power generation units with the rated output of 50MW. Please refer to annex 1 to see the serial number of the meters.

4. Monitoring results

4.1 Emission reduction

The calculated emission reductions amount is **729,296 tonnes CO₂eq**. A summary of the monitoring results is included in Annex 1 of this report.

4.2 Monitoring period covered

This is the only VER monitoring report for this project. It covers the following period:

- 1) 28 March 2006¹ until
- 2) 18 December 2008. The project being registered on 19 December 2008.

4.3 Presentation of monitoring results spreadsheet

All monitoring parameters have been listed in the tables below and are outlined in Figure1.

All monitoring data has been included in an Excel workbook. This includes:

1. Summary. This worksheet contains an overview of the calculation of emission reductions and general notes [provided in Annex 1].

¹ According to page 11 of Voluntary Carbon Standard 2007, “The earliest credit start date under the VCS 2007 shall be 28 March 2006”.

2. Calculations and raw data: Show the calculation of emission reductions on the basis of raw data. (Electronic copies of this data can be made available to the verifier upon request.) There are two electricity meters used to monitor electricity generated by the project activity. One is the main electricity meter which was installed and maintained by the project entity, the other is the backup meter which was installed and maintained by the Zhangjiagang Power Supply Company for cross-checking. Both the main electricity meter and the backup electricity meter are installed in the 35KV transformer station. The type number of the main electricity meter is DSSD311, and its serial number is 200407518A0046. The type number of the backup electricity meter is DSSD22, and its serial number is 101130051.

There are six auxiliary electricity meters used to monitor electricity consumed by all equipments in the boundary of the project activity. These meters were installed and maintained by the project entity. There are two calibrated electricity meters in place as backup auxiliary meters if any auxiliary electricity meter is out of order then the calibrated backup auxiliary meter will be used to monitor the electricity consumed by the project activity.

As per page 12 of the register PDD, in the project situation the proposed project (power plant) has to be connected to electricity grid, i.e. Jiangsu Zhangjiagang Grid which is an integral part of East China Grid. Grid-connectedness is required as the project entity is obligated to ensure the safe utilization of electric power for the production facility.

The electricity demand and consumption by the project owner has to be deferred to the electricity dispatch centre which is controlled by the grid company. In principle the electricity demand and consumption by project owner for the production facilities will be first satisfied by the grid company due to the electricity contribution made by project owner. All the electricity demand and consumption by anyone in China have to be deferred to electricity dispatch centre which is controlled by the grid company following the regulation issued by China State Council. To minimise transmission loss all the electricity from the project activity is in practice therefore fed back to the project owner's facilities through wheeling.

Therefore, the source of the auxiliary power is from the project activity, the internal grid is defined as the grid within the company boundary of the project owner, and the external grid is defined as Jiangsu Zhangjiagang Grid which is an integral part of East China Grid.

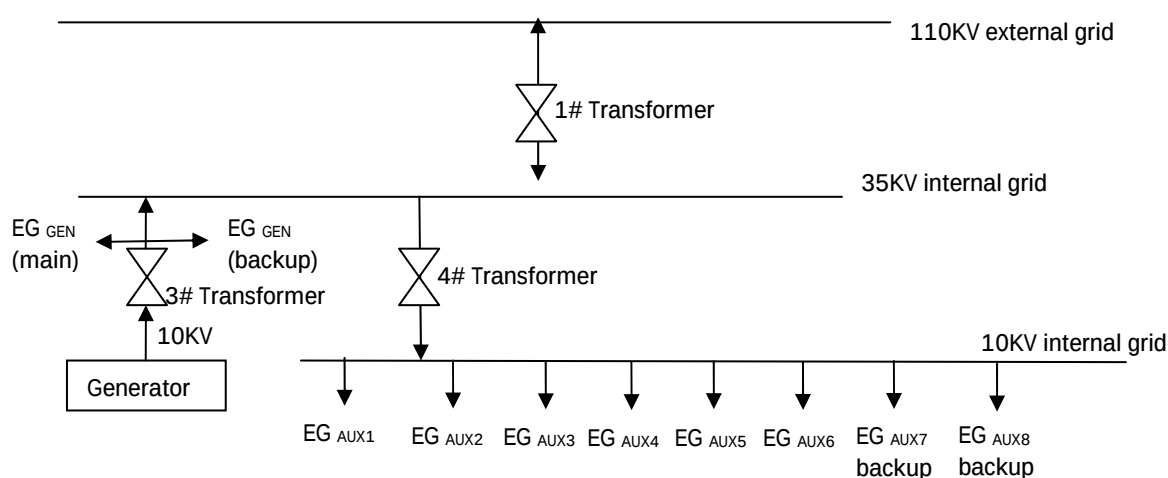


Figure 1: Monitoring sketch map

Data / Parameter:	EG_{GEN}
Data unit:	MWh
Description:	Total Electricity generated by the project activity during the year y
Source of data to be used:	Electronic records based on the DCS
Value of data applied for the purpose of calculating expected emission reductions in section B.5	This data is monitored to verify the power generated by the project activity.
Description of measurement methods and procedures to be applied:	Accuracy degree: 1s (power component) Type number: DSSD331 Serial number: 200407518A0046 Installation date: 20 March 2005 Calibration date: 20 March 2005, 20 March 2006, 20 March 2007, 20 March 2008, 20 March 2009 Calibration authority: Suzhou Institute of Measurement and Testing Technology Electricity meter is used to measure electricity generated; The electricity data is recorded every 2 hours; The data is recorded the electroniccally and on paper as well stored on CD-Rom.
QA/QC procedures to be applied:	The electricity meter undergoes maintenance/calibration in accordance with the power industry standards. Electricity meter was calibrated by the Suzhou Institute of Measurement and Testing Technology every year and the calibration document is kept by the project entity. The Zhangjiagang Power Supply Company monitors the data at switch box by the backup meter, which is installed and sealed by the Zhangjiagang Power Supply Company.
Any comment:	

Data / Parameter:	EG_{AUX}
Data unit:	MWh
Description:	Auxiliary electricity which includes electrical energy utilized by the waste heat generation equipments and the power generating equipment in the project boundary in the year y.
Source of data to be used:	Measurement records of electricity meters (EG _{AUX1} –EG _{AUX6}) and on the DCS
Value of data applied for the purpose of calculating expected emission reductions in section B.5	This data is monitored to verify the power consumed by the project activity.
Description of measurement methods and procedures to be applied:	Accuracy degree: 1s (power component) Type number: DSSD331 Serial number: 200407518A0032 (EG_{AUX1}) 200406515A0242 (EG_{AUX2}) 200406515A0245 (EG_{AUX3}) 200407518A0279 (EG_{AUX4}) 200407518A0276 (EG_{AUX5}) 200407518A0249 (EG_{AUX6}) Installation date: 20 March 2005 Calibration date: 20 March 2005, 20 March 2006, 20 March 2007, 20 March 2008, 20 March 2009 Calibration authority: Suzhou Institute of Measurement and Testing Technology Electricity meter is used to measure electricity consumed; The electricity data is recorded every 2 hours; The data is recorded the electronically and on paper as well stored on CD-Rom.
QA/QC procedures to be applied:	The electricity meter undergoes maintenance/calibration in accordance with the power industry standards. Electricity meter was calibrated by the Suzhou Institute of Measurement and Testing Technology every year and the calibration document is kept by the Project Entity .
Any comment:	The total value of auxiliary electricity contains the energy consumed in the project boundary.

4.4 Data acquisition and data processing system

The project activity's power generation and power consumption data is acquired, displayed and stored by the electricity meter, and then sent to the central control computer via optical cable.

The data of the net power supplied by the project activity is the difference of EG_{GEN} and EG_{AUX}.

4.5 Calculation methodology & formula

The calculation methodology applies ACM0004 and the formula for emission reduction is listed below:

$$BE_{electricity,y} = EG_y \times EF_{electricity,y}$$

$$EG_y = EG_{GEN} - EG_{AUX}$$

$$ER_y = BE_y$$

Where:

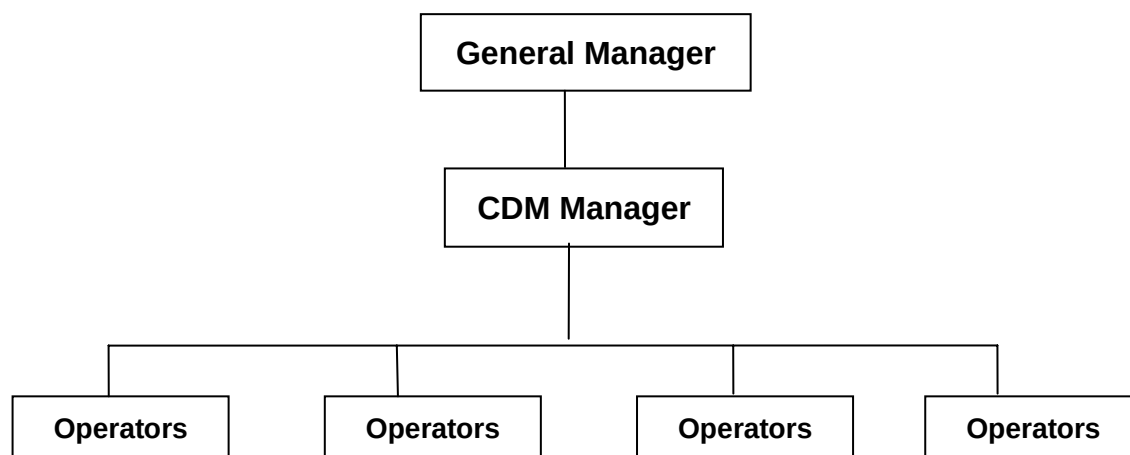
BE _y	is the baseline emissions during the year y in tCO ₂ e.
EG _{GEN}	is the total quantity of electricity generated by the project activity during the year y in GWh.
EG _{AUX}	is the total quantity of auxiliary electricity which includes electrical energy utilized by the waste heat generation equipments and the power generating equipment in the project boundary in the year y in GWh.
EF _y	is the CO ₂ baseline emission factor for the electricity displaced due to the project activity during the year y (tCO ₂ /MWh).

5. Quality Assurance and Quality Control

5.1 Management and Operational System

5.1.1. Operational and Management Structure

Four employees are dedicated full-time to the monitoring work. They report to the CDM manager, with whom they form the monitoring team. The CDM manager is in the position to report to the General Manager. The team meeting is held monthly to check monitoring work and discuss problems, if any.



(1). Responsibility of General Manager:

All the affairs related to CDM project monitoring is managed by general manager.

(2). Responsibility of CDM Manager:

In charge of Meters calibration and training affairs; checking the daily operation report forms; archiving emergency situation disposal report.

(3). Responsibility of operators:

In charge of data supervision, identification, and archiving; executing emergency plan; Draft operation report forms and emergency situation disposal report.

5.1.2. Performed Role

The team implements monitoring of the project activity according to the Work Instruction and its role is to submit to the verifier (DOE) periodic monitoring reports necessary to verify emission reductions. The team also collects and archives relevant monitoring record and related proof documents.

5.1.3. Monitoring supporting team

Generation operating team

Team leader: 1 personnel × 1 shift

DCS control: 2 personnel × 2 shifts

They form 4 teams and operate the generation by 2 shifts (each 12 hours per day). The leader of the generation operating team is in charge of data supervision, identification, and archiving; execution of the emergency plan; draft operation report forms and emergency situation disposal reporting. The DCS control personnel within the team monitor the electricity generation, and record the data in the daily production reports on 8:00AM, 12:00AM, 17:00PM, 21:00PM and 24:00PM.

5.1.4. Training

- The team has been trained by Shanghai Yangzi Delta Investment and Consulting Co., Ltd to acquire comprehensive knowledge with regard to general and technical aspects of CDM.
- The technology supplier has provided instruction and training on installment, operation, maintenance and calibration of monitoring equipment.

5.1.5. Troubleshooting procedures

The waste heat recovery and utilization project is computer controlled with protection and alarm function, the HRS system and the generation facility will shutdown automatically if there are failures such as steam temperature or pressure exceeds the normal range. All the operational data and alarm messages will be shown on the screen of the central control computer; the operator will report that information to the head of the team for starting the required troubleshooting procedures. There are electrical and mechanical site engineers in charge of the troubleshooting. The DCS systems used for GHG monitoring and reporting have been tested and documented.

5.1.6. Internal audit

All the data collected and recorded are checked each shift by the shift operator, and the operator must sign to confirming the data recorded in the daily record sheet. The leader of each team checks the data record each day, and to combine a monthly report, and the team leader must sign his signature for confirming the monthly report. The CDM manager should check the monthly report, and to combine a yearly report, and sign his signature for

confirming the yearly report. The general manager should check the yearly report and sign his signature.

5.2 QC/QA Procedures

5.2.1 Calibration of equipment: Electricity meters are calibrated every year to the relevant national standards by Suzhou measure and test institute and the certificates are kept by the project entity.

5.2.2 The project entity has designated Mr. Yuan Yafei, CDM project manager of TFC to be responsible for the monitoring activities.

5.2.3 The project entity provided training at the start of the project activity to its technicians to enable them to undertake the tasks required by this monitoring plan. The CDM consultant advised the project entity on monitoring and operational work.

5.2.4 According to the routine of the project entity, staff in the charge of monitoring tasks must prepare a daily operation worksheet of the whole plant, where the WHR CDM project activity is included. This daily report will record data monitored, any accidents, failures, and availability of installations. The daily operation worksheet with the CDM project will be checked and audited by the team leader and then sent to CDM project manager and General Manager. The electricity data in CD records and paper records will be archived until two years after the end of the crediting period.

ANNEX 1**Meters type and serial number and the installation date**

:			
Equipments	Type number	Serial number	Installation Date
Electricity Meter (EG _{GEN})	DSSD331	200407518A0046	20 th Mar. 2005
Backup Meter (EG _{GEN})	DSSD22	101130051	Oct. 2006
Electricity Meter (EG _{AUX1})	DSSD331	200407518A0032	20 th Mar. 2005
Electricity Meter (EG _{AUX2})	DSSD331	200406515A0242	20 th Mar. 2005
Electricity Meter (EG _{AUX3})	DSSD331	200406515A0245	20 th Mar. 2005
Electricity Meter (EG _{AUX4})	DSSD331	200407518A0279	20 th Mar. 2005
Electricity Meter (EG _{AUX5})	DSSD331	200407518A0276	20 th Mar. 2005
Electricity Meter (EG _{AUX6})	DSSD331	200407518A0249	20 th Mar. 2005

Attachment documents

1. Meters serial number and the installation date.
2. Calibration certificates for electricity meters;
3. The CDM management manual for Zhang Jiagang waste heat recovery from sulphuric acid production for electricity generation project is in Chinese. All the employees that are working in this division are of Chinese nationality and can read the manual. There are no foreign employees working in the CDM division.

Available documents for reference of DOE verification on site:

1. Worksheets and electronic record of daily operation data of the project entity's facilities;
2. Worksheets and electronic record of monthly operation data of electricity generated by the project activity;
3. Worksheets and electronic record of monthly operation data of electricity consumed by the project activity;

Monitoring results

Yearly Electricity Statistic Report in 2006								Unit : MWh		
Date	EG _{GEN}	EG _{AUX1}	EG _{AUX2}	EG _{AUX3}	EG _{AUX4}	EG _{AUX5}	EG _{AUX6}	EG _y	EF _y (tCO ₂ /MWh)	ER _y (tCO ₂)
28/03-31/03	3683.61	453.92	64.00	0.04	111.68	15.36	274.72	2763.89	0.9047	2500.49
01/04-30/04	25785.28	3308.16	482.76	0.08	837.40	115.76	2089.92	18951.20	0.9047	17145.15
01/05-31/05	25785.28	3561.28	507.08	0.08	870.44	121.12	2290.40	18434.88	0.9047	16678.04
01/06-30/06	25785.28	3479.04	473.92	0.08	838.96	121.44	2368.96	18502.88	0.9047	16739.56
01/07-31/07	25785.28	3634.88	503.90	0.08	876.32	129.12	2621.60	18019.38	0.9047	16302.13
01/08-31/08	25785.28	3543.20	510.54	0.04	876.16	130.84	2655.04	18069.46	0.9047	16347.44
01/09-30/09	25785.28	3481.12	392.00	104.16	841.64	116.72	2370.72	18478.92	0.9047	16717.88
01/10-31/10	36243.48	3742.24	331.24	188.68	871.32	118.64	2412.00	28579.36	0.9047	25855.75
01/11-30/11	34917.11	3618.08	515.80	0.12	851.40	114.20	2243.68	27573.83	0.9047	24946.04
01/12-31/12	35899.92	3687.52	537.44	0.08	867.68	119.00	2181.44	28506.76	0.9047	25790.07
Total in 2006	265455.80	32509.44	4318.68	293.44	7843.00	1102.20	21508.48	197880.56	0.9047	179022.5

Note: As the back-up electricity meter of EG_{GEN} wasn't installed until October 2006, so there was no data for cross-check. As per the MP of register PDD, if there is no data can be used for cross-checking, the electricity generated will be replaced by the lowest value, which is for conservation. Since there is only 28 days in February in 2006, and the actual electricity generated in Feb. 2006 is 25785.28MWh, which is the smallest value before Oct. 2006. So the electricity generated in Feb. 2006 will replace the actual electricity generated in each month before October 2006, and it is conservative.

Yearly Electricity Statistic Report in 2007								Unit : MWh		
Date	EG _{GEN}	EG _{AUX1}	EG _{AUX2}	EG _{AUX3}	EG _{AUX4}	EG _{AUX5}	EG _{AUX6}	EG _y	EF _y (tCO ₂ /MWh)	ER _y (tCO ₂)
01/01-31/01	35951.16	3698.56	542.28	0.04	871.16	119.60	2201.44	28518.08	0.9047	25800.31
01/02-28/02	32303.04	3366.56	492.52	0.08	785.52	107.68	2059.04	25491.64	0.9047	23062.29
01/03-31/03	35853.72	3717.12	504.32	40.40	867.96	118.96	2325.10	28279.86	0.9047	25584.79
01/04-30/04	34693.68	3522.08	0.04	492.40	837.40	113.96	2313.30	27414.50	0.9047	24801.90
01/05-31/05	35946.12	3658.24	0.08	513.08	872.24	122.12	2617.60	28162.76	0.9047	25478.85
01/06-30/06	34425.72	3483.20	0.00	497.60	844.52	119.80	2624.80	26855.80	0.9047	24296.44
01/07-31/07	33275.76	3397.12	89.36	419.64	854.36	127.64	2702.08	25685.56	0.9047	23237.73
01/08-31/08	34922.99	3542.24	546.56	0.04	858.36	130.32	2701.60	27143.87	0.9047	24557.06
01/09-30/09	34744.08	3508.48	537.96	0.04	848.80	118.04	2549.44	27181.32	0.9047	24590.94
01/10-31/10	35721.84	3616.32	555.48	0.04	881.96	116.92	2506.40	28044.72	0.9047	25372.06
01/11-30/11	34025.88	3484.16	534.20	0.12	856.92	112.56	2294.72	26743.20	0.9047	24194.57
01/12-31/12	36673.56	3620.32	556.00	0.12	908.32	117.68	2380.00	29091.12	0.9047	26318.74
Total in 2007	418537.55	42614.40	4358.80	1963.60	10287.52	1425.28	29275.52	328612.43	0.9047	297295.6

Yearly Electricity Statistic Report in 2008								Unit : MWh		
Date	EG _{GEN}	EG _{AUX1}	EG _{AUX2}	EG _{AUX3}	EG _{AUX4}	EG _{AUX5}	EG _{AUX6}	EG _y	EF _y (tCO ₂ /MWh)	ER _y (tCO ₂)
01/01-31/01	36368.64	3531.84	557.88	0.08	922.12	118.44	2342.40	28895.88	0.9047	26142.10
01/02-28/02	33414.36	3296.64	522.68	0.12	860.36	109.88	2171.84	26452.84	0.9047	23931.88
01/03-31/03	34512.24	3316.48	238.56	281.92	888.40	114.84	2438.72	27233.32	0.9047	24637.98
01/04-30/04	31723.44	3663.00	0.04	463.12	845.40	109.92	2440.00	24201.96	0.9047	21895.51
01/05-31/05	35155.25	3663.00	0.08	493.28	876.40	120.48	2683.04	27318.97	0.9047	24715.47
01/06-30/06	33174.54	3663.00	0.04	478.36	846.56	119.16	2646.56	25420.86	0.9047	22998.25
01/07-31/07	29667.12	3663.00	4.84	453.00	828.24	127.96	2723.04	21867.04	0.9047	19783.11
01/08-31/08	32813.71	4076.96	0.08	483.68	887.08	128.08	2719.20	24518.63	0.9047	22182.00
01/09-30/09	29312.69	4830.72	0.04	466.28	878.96	118.20	2704.16	20314.34	0.9047	18378.38
01/10-31/10	25787.16	5336.80	2.64	459.48	889.68	113.24	2469.60	16515.72	0.9047	14941.77
01/11-30/11	33332.04	5698.24	0.04	507.04	915.04	113.92	2298.40	23799.36	0.9047	21531.28
01/12-18/12	18694.20	3387.52	0.04	297.04	546.92	67.04	1308.00	13087.64	0.9047	11840.39
Total in 2008	373955.39	48127.20	1326.96	4383.40	10185.16	1361.16	28944.96	279626.56	0.9047	252978.1

Note: The electricity meter for monitoring EG_{AUX1} was wrong and it was found by the calibration authority in the latest calibration (on 20 March, 2009), and the auxiliary electricity amount (EG_{AUX1}) monitored actually is higher than its rated electricity consumption. Since it is not clear when meter was started faultly recording therefore as per conservative approach, the value in EG_{AUX1} which was lower than 3663MWh (the rated electricity consumption of 43948/12, which was defined in the registered PDD) was replaced with 3663MWh per month for conservative from 20 March 2008 (last calibration date) to 18 December 2008.

Yearly Electricity Statistic Report								Unit : MWh		
Year	EG _{GEN}	EG _{AUX1}	EG _{AUX2}	EG _{AUX3}	EG _{AUX4}	EG _{AUX5}	EG _{AUX6}	EG _y	EF _y (tCO ₂ /MWh)	ER _y (tCO ₂)
2006	265455.80	32509.44	4318.68	293.44	7843.00	1102.20	21508.48	197880.56	0.9047	179022.5
2007	418537.55	42614.40	4358.80	1963.60	10287.52	1425.28	29275.52	328612.43	0.9047	297295.6
2008	373955.39	48127.20	1326.96	4383.40	10185.16	1361.16	28944.96	279626.56	0.9047	252978.1
Total	1057948.74	123251.04	10004.44	6640.44	28315.68	3888.64	79728.96	806119.55	0.9047	729296

2. 12