VERIFICATION AND CERTIFICATION REPORT

HEBEI YINGXIN GLASS GROUP CO. LTD. GLASS FURNACE FLUE GAS WASTE HEAT TO ENERGY PROJECT

Gold Standard ID No.: GS750
Monitoring Period:
1 January 2012 to 31 March 2014

Report No.: CTI/NB-2014-0201
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Verification Organisation:	**Client:**
Shenzhen CTI International Certification Co., Ltd	Swiss Carbon Assets Ltd.
Project Title:	**Report Number:**
Hebei Yingxin Glass Group Co. Ltd. Glass Furnace Flue Gas Waste Heat to Energy Project	CTI/NB-2014-0201
Monitoring period:	**Applied methodology/version:**
1 January 2012 to 31 March 2014	ACM0012, version 3.2

Summary:

Shenzhen CTI International Certification Co., Ltd (CTI) has performed the verification of the emission reductions reported for the "Hebei Yingxin Glass Group Co. Ltd. Glass Furnace Flue Gas Waste Heat to Energy Project" in China (GS Ref. No. GS750) for the period 1 January 2012 to 31 March 2014.

In our opinion, the GHG emission reductions reported for the project in the monitoring report (version 3.0 dated 1 September 2014) are fairly stated. The GHG emission reductions were calculated correctly on the basis of the approved monitoring methodology ACM0012 (version 3.2) and the monitoring plan contained in the GS-Project Design Document (version 2.0 dated 11 November 2010).

CTI can confirm that the GHG emission reductions are calculated without material misstatements. Based on the evidence and information that are considered necessary to guarantee that GHG emission reductions are appropriately calculated, CTI is able to certify that emission reductions from Hebei Yingxin Glass Group Co. Ltd. Glass Furnace Flue Gas Waste Heat to Energy Project during the period 1 January 2012 to 31 March 2014 amount to 128,410tCO_2e.

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Abbreviations

CAR	Corrective Action Request
CL	Clarification request
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
CTI	Shenzhen CTI International Certification Co., Ltd
DOE	Designated Operational Entity
EF	Emission Factor
ER	Emission Reduction
FAR	Forward Action Request
GHG	Greenhouse gas(es)
GS	Gold Standard
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
KP	Kyoto Protocol
MP	Monitoring Plan
MR	Monitoring Report
NCPG	North China Power Grid
PDD	Project Design Document
SD	Sustainable Development
tCO_2e	Tonnes of CO_2 equivalents
UNFCCC	United Nations Framework Convention on Climate Change
VER	Voluntary Emission Reductions
WECM	Waste Energy Carrying Medium

Table of Content ***Page***

1 INTRODUCTION 1
1.1 Objective 1
1.2 Scope and criteria 1
1.3 Project Description and period covered 1
1.4 Methodology for determining emission reductions 2
1.5 Verification team 2

2 METHODOLOGY 3
2.1 Document review 3
2.2 On-site assessment 4
2.3 Reporting of findings 5

3 VERIFICATION FINDINGS 5
3.1 Remaining issues from previous validation/verification 5
3.2 Post registration changes 5
3.3 Project implementation 6
3.4 Compliance of monitoring plan with monitoring methodology 6
3.5 Compliance of monitoring with the monitoring plan 7
3.6 Assessment of data and calculation of emission reductions 16
3.7 Quality of evidence to determine emission reductions 18
3.8 Monitoring of GS Sustainability Indicators 19
3.9 Management and operational system 25

4 VERIFICATION AND CERTIFICATION STATEMENT 26

5 REFERENCES 27

Appendix A Remaining issues from previous validation/verification
Appendix B GS Verification Protocol
Appendix C Main questions discussed during on-site interview
Appendix D Certificate of Competence

1 INTRODUCTION

Swiss Carbon Assets Ltd. has commissioned Shenzhen CTI International Certification Co., Ltd (CTI) to carry out the verification and certification of emission reductions reported for the GS project "Hebei Yingxin Glass Group Co. Ltd. Glass Furnace Flue Gas Waste Heat to Energy Project" (the project) for the period 1 January 2012 to 31 March 2014. This report contains the findings from the verification and a certification statement for the emission reductions.

1.1 Objective

Verification is the periodic independent review and *ex post* determination by a Designated Operational Entity (DOE) of the monitored reductions in GHG emissions that have occurred as a result of the registered GS project activity during a defined verification period.

Certification is the written assurance by a DOE that, during a specific period in time, a project activity achieved the emission reductions as verified.

The objective of this verification was to verify and certify the GS voluntary emission reductions (GS VER) reported for the "Hebei Yingxin Glass Group Co. Ltd. Glass Furnace Flue Gas Waste Heat to Energy Project" for the period 1 January 2012 to 31 March 2014 on the basis of UNFCCC criteria for the CDM and GS rules.

1.2 Scope and criteria

The scope of the verification is to verify that:

- The project activity has been implemented and operated in accordance with the registered GS-PDD;
- The monitoring plan complies with the monitoring methodology and the actual monitoring complies with the monitoring plan, including compliance with any guidance of CDM and GS regarding deviations from the provisions of a registered plan and/or methodology;
- The data and calculation of GHG emission reductions have been assessed to correctly support the emission reductions being claimed.

The verification shall ensure that reported emission reductions are complete and accurate in order to be certified.

1.3 Project Description and period covered

Project Parties:	China (host Party), Switzerland (other Party)
Project title:	Hebei Yingxin Glass Group Co. Ltd. Glass Furnace Flue Gas Waste Heat to Energy Project
GS registration No:	GS750
GS registration date:	21 November 2010.
Applied methodology:	ACM0012 (version 3.2)
Project Participants:	Hebei Yingxin Glass Group Co. Ltd. from China

	Swiss Carbon Assets Ltd. from Switzerland
Location of the project activity:	Donghuan Road, Shahe City (county-level city), Xingtai City, Hebei Province, China
Project's crediting period:	1 January 2010 to 31 December 2019 (Fixed)
Period verified in this verification:	1 January 2012 to 31 March 2014

1.4 Methodology for determining emission reductions

According to the methodology ACM0012 version 3.2 /46/, the emission reductions (ER_y) by the project activity is the difference between the baseline emissions (BE_y) and project emissions (PE_y).

$ER_y = BE_y - PE_y$

1.4.1 Baseline emissions

According to the methodology ACM0012 (version 3.2) /46/ because the project neither involves baseline emissions from steam generation, nor waste gas flaring. As a Type-1 activity which waste energy is only used to generate electricity, hence the baseline emissions for the project activity are determined as follows:

$$BE_y = BE_{Elec,y} = f_{cap} \times EG_y \times EF_{grid,CM,y}$$

Where

$BE_{Elec,y}$: baseline emissions from electricity during the year *y* in tons of CO_2;

f_{cap} : the 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. The ratio is 1 if the waste energy generated in project is same or less than that generated in base year;

EG_y : the metered electricity supplied from the project activity to the glass-making plant;

$EF_{grid,CM,y}$: CO_2 baseline emission factor for the electricity displaced due to the project activity during the year y, which is fixed *ex-ante* as 0.8935 tCO_2/MWh for the whole crediting period according to registered PDD and has been verified in validation report.

1.4.2 Project emissions

Project emissions (PE_y) are not considered because the project doesn't utilizes auxiliary fossil fuel, and auxiliary electricity consumption by the project activity will be deducted from gross electricity generated by the project.

1.4.3 Leakage

According to ACM0012 (version 3.2), leakage (LE_y) is not to be considered.

1.5 Verification team

Based on the requirements of competency, experience and qualified sectoral scopes, CTI appointed a verification team in accordance with CTI's internal procedures. The qualification of each team member is detail in Appendix B to this report.

Function	Name	Technical competence	Task Performance*
Team Leader	Lin Shunrong	1.2	☒DR ☒SV ☒RP ☐TR
Verifier	Lin Wu	1.1, 1.2, 2.1, 3.1, 4.1, 13.1, 13.2	☒DR ☐SV ☒RP ☐TR
Technical Expert	Zhang Lei	1.1,1.2,4.1,4.3,4.4,13.1,13.2	☒DR ☐SV ☒RP ☐TR
Technical Reviewer	Zhou Lu	1.2, 2.1, 2.2, 3.1, 4.1, 13.1	☒DR ☐SV ☐RP ☒TR
Technical Expert	Wang Haichao	4.1,4.2,4.3,4.5,9.1	☒DR ☐SV ☐RP ☒TR

*DR=Document review; SV=Site visit; RP=Reporting; TR=Technical review

2 METHODOLOGY

The monitoring of the project activity consists of the monitoring of the emission reductions and the monitoring of the contribution to sustainable development. CTI has assessed and determined that the implementation and operation of the project activity, and the steps taken to report emission reductions and SD indicators monitoring comply with the CDM criteria and relevant guidance provided by the UNFCCC and GS rules.The assessment involved a document review of relevant documentation as well as an on-site visit(s).

2.1 Document review

The monitoring report (version 1.0 dated 18 April 2014) was provided to CTI on 30 April 2014. In addition to the monitoring report (version 1.0 dated 18 April 2014, and updated version 2.0 dated 12 June 2014 and version 3.0 dated 1 September 2014 /1/, CTI reviewed:

- The registered GS-PDD for the project activity /3/, including the monitoring plan and the corresponding validation report /5/;
- The registered Gold Standard Passport for the project activity/4/ ;
- Previous verification /6//7/;
- The monitoring report, including the claimed emission reductions for the project /1//2/;
- Baseline and monitoring methodology ACM0012 (version 3.2) /46/ applied by the project;
- Relevant decisions, clarifications and guidance from the CMP and the CDM Executive Board /43/ -/45//47//48/;
- Relevant requirements and principles as required under the GS/49//50/; and
- Other information and references relevant to the project activity /8/-/42/.

During the desk review, CTI has applied standard auditing techniques to assess the quality of information provided. The following activities were performed:

- A review of the data and information presented to verify their completeness;

- A review of the monitoring plan and monitoring methodology, paying particular attention to the frequency of measurements, the quality of metering equipment including calibration requirements, the monitoring of SD indicators, and the quality assurance and quality control procedures; and
- An evaluation of data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions.

2.2 On-site assessment

On 15~16 May 2014, CTI visited Hebei Yingxin Glass Group Co. Ltd. and performed on-site assessment. The key personnel of the project were interviewed or assisted the verification team /51//52/. The on-site interview was conducted in order to confirm the information, resolve issues identified in the document review, and verify the SD indicators required by GS, main questions discussed refer to Appendix C for further details.

During the on-site assessment, CTI has applied standard auditing techniques to assess the quality of information provided. The following aspects of the GS project activity have been verified:

- An assessment of the implementation and operation of the registered GS project activity is as per the GS-PDD for the project activity;
- A review of information flows for generating, aggregating and reporting the monitoring parameters; and
- Interviews with relevant personnel to confirm that the operational and data collection procedures are implemented in accordance with the Monitoring Plan in the GS-PDD;
- A cross-check of information and data provided in the Monitoring Report and data with other sources, such as plant log books, inventories, purchase records or similar data sources;
- A check of the monitoring equipment including calibration performance and observations of monitoring practices against the requirements of the GS-PDD and the selected methodology;
- A review of calculations and assumptions made in determining the GHG data and emission reductions; and
- An identification that quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters.

The data presented in the monitoring report were assessed by review of the detailed project documentation and production records, as well as by interviews with personnel from the project participant Hebei Yingxin Glass Group Co. Ltd. and project consultant South Pole Carbon Asset Management Ltd., and observation of collection of measurements, observation of established monitoring and reporting practices and assessment of the reliability of monitoring equipment. This has enabled the verification team to assess the accuracy and completeness of reported monitoring results, to verify the correct application of the approved monitoring methodology and the determination of the emission reductions.

In addition all parameters required by the monitoring methodology ACM0012 (version 3.2)

/46/ and GS rules/49//50/, and the management system were assessed during the site visit.

2.3 Reporting of findings

The objective of this phase of the verification was to resolve any issues which needed be clarified prior to CTI's conclusion that i) the project activity has been implemented and operated in accordance with the registered GS-PDD or any approved revised GS-PDD, ii) the monitoring plan complies with the monitoring methodology and the actual monitoring complies with the monitoring plan and iii) the data and calculation of GHG emission reductions are correct.

A corrective action request (CAR) is issued, where:

i. Non-conformities with the monitoring plan or methodology are found in monitoring and reporting and has not been sufficiently documented by the project participants, or if the evidence provided to prove conformity is insufficient;
ii. Modifications to the implementation, operation and monitoring of the registered project activity has not been sufficiently documented by the project participants;
iii. Mistakes have been made in applying assumptions, data or calculations of emission reductions which will impair the estimate of emission reductions;
iv. Issues identified in a FAR during validation to be verified during verification have not been resolved by the project participants.

A clarification request (CL) shall be raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

A forward action request (FAR) is issued for actions if the monitoring and reporting require attention and/or adjustment for the next monitoring period.

The verification team identified 1 CAR and 5 CLs in this monitoring period, and no FAR was raised. The CARs and CLs were satisfactorily addressed by the project participants in the revising monitoring report (refer to Appendix A for further details). All changes made to the monitoring report (version 3.0 dated 1 September 2014) are as a result of the verification findings.

3 VERIFICATION FINDINGS

This section summarises the findings from the verification of the emission reductions reported for the "Hebei Yingxin Glass Group Co. Ltd. Glass Furnace Flue Gas Waste Heat to Energy Project" for the period 1 January 2012 to 31 March 2014.

3.1 Remaining issues from previous validation/verification

This monitoring period 1 January 2012 to 31 March 2014 is the second periodic GS verification of the project. There are no follow-up action requests remaining from the validation. However, 2 FARs remained from the first verification. As discussed in Table A-1 of the Appendix A, the PP has adequately addressed these FARs.

3.2 Post registration changes

There were no post registration changes identified by CTI to this verification.

3.3 Project implementation

The project is a waste energy recovery project for glass production lines, located in Donghuan Road, Shahe City (county-level city), Xingtai City, Hebei Province, P.R.China. It installs four waste heat recovery boilers to recover waste heat generated from existing glass furnaces, and the recovered energy is used to drive two sets of turbine-generator units to generate electricity for captive use.

As per the registered GS-PDD of the project /3/, it stated fixed crediting period was selected and the starting date of the crediting period was 1 January 2010. The project activity was registered as GS project on 30 September 2011. As stated in the first verification report /7/ and by checking daily operation and maintenance records /15/ during on-site visit, CIT confirmed the project completed construction and started trail operation on 12 August 2009, and as a result GS monitoring started from 1 January 2010. The selected second monitoring period 1 January 2012 to 31 March 2014 is within the fixed crediting period 1 January 2010 to 31 December 2019.

The details of the boiler, turbine and generator with respect to their number, type and model of the machines have been verified during the on-site visit. CTI has verified that the waste heat recovery power plant included the installation of four waste heat recovery boilers and two sets of turbine-generator units with rated power of 6MW each /8/, and confirmed to be as per the GS-PDD/3/.

The control system at the power plant is automated and assures continuous operation, including monitoring on malfunction of equipment.

During on-site interview and by checking the daily operation and maintenance records /15/, there was no equipment overhauled in this monitoring period. No retrofit/modification was found for the project activity by checking the plant operation and maintenance records /15/ and interviewing with the manager and operator /51/. One generator of the power plant was shutdown for over 5 months in year 2012 due to the reduction of waste supply from the glass plant, because two glass production lines of the glass plant experienced overhaul for 7 and 8 months respectively in 2012 /15/.CTI confirmed that the plant was under a normal operation as expected in this monitoring period.

On-site training for the GS related procedures including monitoring, recording and reporting was verified to be in place /11/ and their implementation was confirmed by interview with the key operators and observing the operation /51/.

As part of the site visit, CTI was able to confirm that the project implementation is in accordance with the project description contained in the GS-PDD (version 2.0 dated 11 November 2010). The verification team confirmed through visual inspection and document review that all physical features of the proposed GS project activity including data collection systems and storage systems have been implemented in accordance with the GS-PDD /3/.

3.4 Compliance of monitoring plan with monitoring methodology

CTI is able to confirm that the monitoring plan in the GS-PDD (version 2.0 dated 11 November 2010) /3/ is in accordance with the approved methodology applied by the project activity, i.e. ACM0012 (version 3.2) /46/.

3.5 Compliance of monitoring with the monitoring plan

The monitoring has been carried out in accordance with the monitoring plan contained in the PDD (version 2.0 dated 11 November 2010) /3/ and Passport version 2 dated 8 May 2011. CTI confirms that all parameters stated in the monitoring plan are monitored and reported appropriately. All parameters required to be monitored by the monitoring plan as per the monitoring methodology ACM0012 (version 3.2) /46/, and the management system were assessed during the site visit. The monitoring report lists each parameter required by the monitoring plan and the information flow (i.e. from data generation, aggregation, recording, calculation and reporting) for these parameters is provided. The information flow for the each parameter in further verified in the following sections.

3.5.1 Factor and datum determined ex-ante

All reported factors determined *ex-ante* by the monitoring methodology ACM0012 (version 3.2) and indicated in the GS-PDD (version 2.0 dated 11 November 2010) were assessed as follows:

a. Baseline emission factor of NCPG***($EF_{grid,CM,y}$)***

In the GS-PDD, the *ex-ante* determined emission factor 0.8935 tCO_2/MWh for the NCPG is applied during the crediting period (including this monitoring period).

b. Output energy (electricity) that can be theoretically produced ($Q_{OE, BL}$)

Output energy (electricity) that can be theoretically produced (in MWh) is determined on the basis of maximum recoverable energy from the WECM, which would have been released (or WECM would have been flared or energy content of WECM would have been wasted) in the absence of project activity ($Q_{OE, BL}$).

As per the GS-PDD, the value of 86,400 MWh for a year for $Q_{OE,BL}$ is applied in the calculation of $f_{cap.}$

3.5.2 Factors and datum monitored or calculated ex-post

The below tables describe for each parameter, which is to be measured according to the monitoring plan, how CTI has verified that i) the actual monitoring complies with the monitoring plan and that ii) data have been assessed to correctly support the emission reductions being claimed.

	Assessment/ Observation
Data / Parameter:	Electricity exported by the project activity to the plant during year y in MWh ($EG_{export,y}$)
Measuring frequency:	Continuously
Reporting frequency:	Monthly
Assessment of measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology.	The measuring frequency (continuously) is to read and record data on daily basis and aggregated monthly in accordance with the monitoring plan and monitoring methodology. Since there is not specific requirement for reporting frequency in the monitoring methodology, the reporting frequency (monthly) for this parameter did reflect to the monitoring practise.
Type of monitoring equipment:	Electricity meters
Assessment of accuracy and calibration of the	Main meter M081 /9/

monitoring equipment in accordance with the monitoring plan and monitoring methodology.	Type/Model: DSSD904 SN: 006513 Accuracy: 0.5S Calibration frequency: annual Calibration entity: Shahe Power Supply Company/10/ Calibration date: 16 October 2011 Calibration validity: 15 October 2016 Main meter M091 /9/ Type/Model: DSSD904 SN: 006519 Accuracy: 0.5S Calibration frequency: annual Calibration entity: Shahe Power Supply Company/10/ Calibration date: 16 October 2011 Calibration validity: 15 October 2016 Glass plant fan line meter M045 /9/ Type/Model: DSSD331 SN: 550476 Accuracy: 0.5 Calibration frequency: annual Calibration entity: Shahe Power Supply Company/10/ Calibration date: 13 September 2011 Calibration validity: 12 September 2016 In the GS-PDD, it stated the accuracy of meters for monitoring electricity export will not worse than 0.5. The main meters M081 and M091 have the accuracy of 0.5S (0.5%) and the glass plant fan line meter M045 has the accuracy of 0.5 (0.5%) which are consistent with the value stipulated in the GS-PDD. During the on-site visit, all the calibration records were reviewed. Meters M091 and M081 were calibrated on 16 October 2011, and meter M045 was calibrated on 13 September 2011, respectively. The calibration certificates for all meters are valid for 5 years which meets the requirement from the relevant national standard /34//35/ and reflects to the monitoring practice of China. However, as stated in the GS-PDD the calibration frequency is once a year. Hence, the calibration had not been conducted appropriately as per the monitoring plan. As a result, there is a delay from 16 October 2012 ~ 31 March 2014 for M091 and M081 and from 13 September 2012 to 31 March 2014 for M045 during this

	monitoring period. Therefore, to assess the time gap of calibrations, the maximum permissible error (the accuracy) of the instruments was used to decrease the measured values taken for the electricity export. For meters M081 and M091 with accuracy 0.5S (0.5%) and meter M045 with accuracy 0.5 (0.5%), the accuracy of 0.5% was applied for this monitoring period from 1 January 2012 to 31 March 2014 /2/. It is conservative and reasonable by CTI. Detail can refer to CL 2 in Appendix A. As per the GS-PDD, the standard of Technical Administrative Code of Electric Energy Metering (DL/T448-2000) /34/ was applied for calibration. However as the local calibration entity applies the Verification Regulation of Electrical Energy Meters with Electronics (JJG596-1999) /35/, which is also a national standard and widely used in the industry, and thus acceptable.
Assessment of how to verify the reported values in the monitoring report.	The amount of electricity export is determined by monitoring meters on the hourly and daily basis when the power plant is operating, and these daily readings /17/ are aggregated into monthly reports. CTI has verified these values to be consistent with the information used in the ER spreadsheet /2/.
Assessment of how to cross-check the reported values with other available data.	The meter reading was recorded at the 25th each month jointly by the power plant and glass plant. There is no cross check measure indicated for electricity export in the monitoring plan of the GS-PDD. CTI has verified the quality assurance and quality control procedures from the project, and interviewed with the project implementation team. CTI confirmed that the project team is able to conduct the management and monitoring well, and recorded values are reasonable and acceptable.

	Assessment/ Observation
Data / Parameter:	Electricity imported by the Project activity to the plant during year y in MWh ($EG_{import,y}$)
Measuring frequency:	Continuously
Reporting frequency:	Monthly
Assessment of measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology.	The measuring frequency (continuously) is to read and record data on daily basis and aggregated monthly in accordance with the monitoring plan and monitoring methodology. Since there is not specific requirement for reporting frequency in the monitoring methodology, the reporting frequency (monthly) for this parameter did reflect to the monitoring practise.

Type of monitoring equipment:	Electricity meters
Assessment of accuracy and calibration of the monitoring equipment in accordance with the monitoring plan and monitoring methodology.	Main meter M081 Type/Model: DSSD904 SN: 006513 Accuracy: 0.5S Calibration frequency: annual Calibration entity: Shahe Power Supply Company/10/ Calibration date: 16 October 2011 Calibration validity: 15 October 2016 Main meter M091 Type/Model: DSSD904 SN: 006519 Accuracy: 0.5S Calibration frequency: annual Calibration entity: Shahe Power Supply Company/10/ Calibration date: 16 October 2011 Calibration validity: 15 October 2016 In the GS-PDD, it stated the accuracy of meters for monitoring electricity import will not worse than 0.5. The main meters M081 and M091 have the accuracy of 0.5S (0.5%) which are consistent with the value stipulated in the GS-PDD. During the on-site visit, all the calibration records were reviewed. Meters M091 and M081 were calibrated on 16 October 2011. The calibration certificates for all meters are valid for 5 years which meets the requirement from the relevant national standard /34//35/ and reflects to the monitoring practice of China. However, as stated in the GS-PDD the calibration frequency is once a year. Hence, the calibration had not been conducted appropriately as per the monitoring plan. As a result, there is a delay from 16 October 2012 ~ 31 March 2014 for M081 and M091 during this monitoring period. Therefore, to assess the time gap of calibrations, the maximum permissible error (the accuracy) of the instruments was used to increase the measured values taken for the electricity import. For meters M081 and M091, the accuracy 0.5S (0.5%) was applied for this monitoring period 1 January 2012 to 31 March 2014. It is conservative and reasonable by CTI. Detail can refer to CL 2 in Appendix A. As per the GS-PDD, the standard of Technical

	Administrative Code of Electric Energy Metering (DL/T448-2000) /34/ was applied for calibration. However as the local calibration entity applies the Verification Regulation of Electrical Energy Meters with Electronics (JJG596-1999) /35/, which is also a national standard and widely used in the industry, and thus acceptable.
Assessment of how to verify the reported values in the monitoring report.	The amount of electricity import is determined by monitoring meters on the hourly and daily basis when the power plant is operating, and these daily readings /17/ are aggregated into monthly reports. CTI has verified these values to be consistent with the information used in the ER spreadsheet /2/.
Assessment of how to cross-check the reported values with other available data.	The meter reading was recorded at the 25th each month jointly by the power plant and glass plant. There is no cross check measure indicated for electricity import in the monitoring plan of the GS-PDD, CTI has verified the quality assurance and quality control procedures from the project, and interviewed with the project implementation team. CTI confirmed that the project team is able to conduct the management and monitoring well, and recorded values are reasonable and acceptable.

	Assessment/ Observation
Data / Parameter:	Net electricity output by the project activity during year y in MWh (EG_y)
Measuring frequency:	Calculated value
Reporting frequency:	Monthly
Assessment of measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology.	This value is calculated from the data of $EG_{export,y}$ and $EG_{import,y}$ on daily basis and aggregated monthly in accordance with the monitoring plan and monitoring methodology.
Type of monitoring equipment:	Calculated value from $EG_{export,y}$ and $EG_{import,y}$
Assessment of accuracy and calibration of the monitoring equipment in accordance with the monitoring plan and monitoring methodology.	Calculated value from $EG_{export,y}$ and $EG_{import,y,}$ and relevant information for monitoring equipment refer to the monitoring parameters $EG_{export,y}$ and $EG_{import,y}$. Since the calculation result was crosschecked with data measured at generation plant, the accuracy and calibration of the backup meters installed at generation plant are assessed as follows: Back up meter M041 Type/Model: DSSD331 SN: 500005 Accuracy: 0.2S Calibration frequency: annual Calibration entity: Shahe Power Supply Company/10/ Calibration date: 16 October 2011

	Calibration validity: 15 October 2016 Back up meter M051 Type/Model: DSSD331 SN: 500001 Accuracy: 0.2S Calibration frequency: annual Calibration entity: Shahe Power Supply Company/10/ Calibration date: 16 October 2011 Calibration validity: 15 October 2016 The accuracy and calibration of meters M081, M091 and M045 have been discussed above. In the GS-PDD, it stated the accuracy of meters for monitoring electricity will not worse than 0.5. The accuracy of backup meters M041 and M051 of 0.2S (0.2%) are higher than the value described in the GS-PDD, and also represent good monitoring practice. During the on-site visit, all the calibration records /9/ was reviewed. Meters M051 and M041 were calibrated on 16 October 2011. The calibration certificates are valid for 5 years which meets the requirement from the relevant national standard /34//35/ and reflects to the monitoring practice of China. As per the GS-PDD, the standard of Technical Administrative Code of Electric Energy Metering (DL/T448-2000) /34/ was applied for calibration. However as the local calibration entity applies the Verification Regulation of Electrical Energy Meters with Electronics (JJG596-1999) /35/, which is also a national standard and widely used in the industry, and thus acceptable. As stated in the GS-PDD the calibration frequency is once a year. Hence, the calibration had not been conducted appropriately as per the monitoring plan. Since main meters M091 and M081, and glass plant fan line meter M045 directly monitored electricity export and import. Therefore, to assess the time gap of calibrations, the maximum permissible error (the accuracy) of the instruments was used to decrease the measured values taken for the electricity export, while to increase the measured values taken for the electricity import. For meters M081 and M091, the

	accuracy 0.5S (0.5%) was applied for this monitoring period. For meter M045 the accuracy 0.5(0.5%) was applied. It is conservative and reasonable by CTI. Detail can refer to CL 2 in Appendix A.
Assessment of how to verify the reported values in the monitoring report.	The net electricity supplied to the grid is determined by the electricity export to the glass plant and glass plant fan minus the electricity import, and aggregated into monthly reports. CTI has verified these values to be consistent with the information used in the ER spreadsheet /2/.
Assessment of how to cross-check the reported values with other available data.	The meter reading was recorded at the 25th each month jointly by the project owner and glass plant. According to the monitoring plan of the GS-PDD/3/, the net electricity measured by main meters will be crosschecked with data measured at generation plant. During on-site visit, CTI confirmed meters M051 and M041 which were installed at power plant are the backup meters for cross checking the net electricity measured by main meter M091 and M081 installed at glass plant side /17/. There are four lines between generation side (M041 and M051) and recipient side of glass plant (M081 and M091), two parallel lines connected M051 and M091 (line M051-M091), and two parallel lines connected M041 and M081 (line M041-M081). Based on monitoring data on daily basis and aggregated monthly, the actual line loss for line M051-M091 and line M041-M081 are 0.36% and 0.35%, respectively, in each year 2012, 2013 and 2014. The calculation measure for theoretical line loss has been provided in the ERs spreadsheet/2/. The result show the theoretical line loss for line M051-M091 for year 2012, 2013 and 2014 (January to March) are 0.40%, 0.79% and 0.54, respectively, at average of 0.59%. For line M041-M081, the theoretical line loss is 0.61%, 0.74% and 0.67% respectively, at average of 0.68%. CTI has verified the calculation of line loss, and confirmed the actual line loss is below the theoretical values. Hence, the small gap is considered reasonable and normal. Meter M045 is used for directly monitoring electricity export supplied to glass plant fan line. However, there was not a backup meter for M045, thus it is not available to cross-check the records of

	M045. CTI has verified the quality assurance and quality control procedures from the project, and interviewed with the project implementation team. CTI confirmed that the project team is able to conduct the management and monitoring well, and recorded values are reasonable and acceptable.

	Assessment/ Observation
Data / Parameter:	Quantity of total electricity generation during year y in MWh ($Q_{OE,y}$)
Measuring frequency:	Continuously
Reporting frequency:	Monthly
Assessment of measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology.	The measuring frequency (continuously) is to read and record data on daily basis and aggregated monthly in accordance with the monitoring plan and monitoring methodology. Since there is not specific requirement for reporting frequency in the monitoring methodology, the reporting frequency (monthly) for this parameter did reflect to the monitoring practise.
Type of monitoring equipment:	Electricity meters
Assessment of accuracy and calibration of the monitoring equipment in accordance with the monitoring plan and monitoring methodology.	Meter M040 /9/ Type/Model: DSSD331 SN: 500004 Accuracy: 0.2S Calibration frequency: annual Calibration entity: Shahe Power Supply Company/10/ Calibration date: 16 October 2011 Calibration validity: 15 October 2016 Meter M050 /9/ Type/Model: DSSD331 SN: 500006 Accuracy: 0.2S Calibration frequency: annual Calibration entity: Shahe Power Supply Company/10/ Calibration date: 16 October 2011 Calibration validity: 15 October 2016 In the GS-PDD, it stated the accuracy of meters for monitoring electricity generation will not worse than 1.0. The meters M040 and M050 have the accuracy of 0.2S (0.2%) are higher than the value described in the GS-PDD, and also represent good monitoring practice.

	During the on-site visit, all the calibration records /9/ was reviewed. Meters M040 and M050 were calibrated on 16 October 2011. The calibration certificates for both meters are valid for 5 years which meets the requirement from the relevant national standard /34//35/ and reflects to the monitoring practice of China. However, as stated in the GS-PDD the calibration frequency is once a year. Hence, the calibration had not been conducted appropriately as per the monitoring plan, which cannot cover the whole monitoring period 1 January 2012 to 31 March 2014. As a result, there is a delay from 16 October 2012 ~ 31 March 2014 for M040 and M050 during this monitoring period. For meters M050 and M040, they are used to directly monitor electricity generation ($Q_{OE,y}$) for determining f_{cap}. Therefore, to assess the time gap of calibrations, the maximum permissible error (the accuracy) of the instruments was used to increase the measured values taken for the electricity generation. For meters M040 and M050 the accuracy 0.2S (0.2%) was for this monitoring period 1 January 2012 to 31 March 2014 /2/. It is conservative and reasonable by CTI. Detail can refer to CL 2 in Appendix A. As per the GS-PDD, the standard of Technical Administrative Code of Electric Energy Metering (DL/T448-2000) /34/ was applied for calibration. However as the local calibration entity applies the Verification Regulation of Electrical Energy Meters with Electronics (JJG596-1999) /35/, which is also a national standard and widely used in the industry, and thus acceptable.
Assessment of how to verify the reported values in the monitoring report.	The amount of electricity generation is determined by monitoring meters on the hourly and daily basis when the power plant is operating, and these daily readings /17/ are aggregated into monthly reports. CTI has verified these values to be consistent with the information used in the ER spreadsheet /2/.
Assessment of how to cross-check the reported values with other available data.	The meter reading was recorded at the 25th each month jointly by the project owner and glass plant. There is no cross check measure indicated for electricity generation in the monitoring plan of the GS-PDD, CTI has verified the quality assurance and quality control procedures from the project, and interviewed with the project implementation team. CTI confirmed that the project team is able to conduct the management and monitoring well, and recorded values are reasonable and acceptable.

3.5.3 Data management and control

All necessary documentations are collected, referenced and aggregated. The quality assurance and quality control procedures have been addressed in the GS project management and monitoring manual /12/, including the organization structure with the responsibilities, personnel competencies, monitoring procedures and monitoring management. All monitoring devices have been calibrated and maintained periodically to ensure the accuracy of measurement. By interview with the staff /51/ and check records/11/ during on-site visit, it can be confirmed that the monitoring management system is in place.

3.6 Assessment of data and calculation of emission reductions

CTI confirms that appropriate methods and formulae for calculating baseline emissions, project emissions and leakage have been followed, and the assumptions, emission factors and default values that are applied in the calculation have been justified.

3.6.1 Baseline emissions

Baseline emissions: Baseline emissions ($BE_{Elec,y}$ in tCO_2) are the product of the baseline emissions factor ($EF_{grid,CM,y}$ in tCO_2/MWh) times the net electricity supplied by the project activity (EG_y in MWh), which will otherwise be supplied by the NCPG without the project activity. Baseline emissions are given as:

$$\mathbf{BE_{Elec,y} = f_{cap} \times EG_y \times EF_{grid,CM,y}}$$

Where,

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

EG_y Net quantity of electricity supplied to the glass plant by the project from 1 January 2010 to 31 December 2019.

$EF_{grid,CM,y}$ CO_2 emission factor for the electricity displaced due to the project activity during the year y, which is fixed ex-ante as 0.8935 tCO_2/MWh for the whole crediting period according to registered GS PDD and has been verified in validation report.

f_{cap} 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.

$$\mathbf{EG_y = EG_{export,y} - EG_{import,y}}$$

Where,

$EG_{export,y}$ Electricity exported by the project activity to the plant during year y in MWh.

$EG_{import,y}$ Electricity imported by the Project activity from the grid during year y in MWh.

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

Where,

$Q_{OE, BL}$ Output energy that can be theoretically produced (MWh), to be determined on the basis of maximum recoverable energy from the Waste Energy Carrying Medium (WECM), which would have been released (or WECM would have been flared or energy content of WECM would have been wasted) in the absence of the project activity. In the proposed project, $Q_{OE, BL}$ = 86,400 MWh taken from registered GS PDD /3/.

$Q_{OE, y}$ Quantity of actual output energy (electricity) during year y (MWh), which will be monitored ex-post /3/.

CTI has checked the monitored data regarding electricity supply and electricity generation against monitoring records, and confirmed the consistency and correctness. The result is shown below:

For year 2012:

$Q_{OE, BL}/Q_{OE, 2011}$ = 86,400/ 55,869.86 >1, therefore f_{cap} for year 2012 = 1 according to ACM0012.
The net electricity supplied to the glass plant is 50,451.09 MWh in 2012, which result in the baseline emission reductions 45,078 tCO_2e.

For year 2013:

$Q_{OE, BL}/Q_{OE, 2012}$ = 86,400/87,931.34=0.98 <1, therefore f_{cap} for year 2013 = 0.98 .
The net electricity supplied to the glass plant is 78,890.26 MWh in 2013 which result in the baseline emission reductions 69,260 tCO_2e.

For year 2014 (from 1 January ~ 31 March 2014):

The theoretically electricity generation during 1 January ~ 31 March 2014 is expected as 21,340MWh (86,400/365*90days).

$Q_{OE, BL}/Q_{OE, 2012}$ =21,340/17,760.28 >1, therefore f_{cap} for year 2014 = 1 according to ACM0012.
The net electricity supplied to the glass plant is 15,750.33 MWh from 1 January ~ 31 March 2014which result in the baseline emission reductions 14,072 tCO_2e.

As a result, the baseline emission reductions are round-down to be 128,410 tCO_2e in this monitoring period.

3.6.2 Project emissions

The project emissions are not accounted for as defined to be zero in the GS-PDD /3/ as per the applied methodology ACM0012, version 3.2 /46/. No auxiliary fuels are used and gas cleaning for the proposed project activity, CTI was able to confirm by on-site visit. Hence the project emission is zero.

3.6.3 Leakage

In line with the GS-PDD /3/ and ACM0012 version 3.2 /46/, leakage emissions are deemed negligible and therefore considered to be zero.

3.6.4 Emission reductions

As stated in Section 1.4 above, the emission reductions (ER_y) by the project activity is the difference between the baseline emissions (BE_y) and project emissions (PE_y).

$\mathbf{ER_y = BE_y - PE_y}$

From Section 3.6.1 to 3.6.3, the following information has been achieved:

BE_y = 128,410 tCO_2e

PE_y = 0 tCO_2e

Hence, the emission reductions (ER_y) by the project activity during this monitoring period are calculated to be 128,410 tCO_2e.

The emission reduction calculations have been based on actual monitored data of the plant and the estimation or default values in this monitoring period, from 1 January 2012 to 31 March 2014 which have been verified by CTI. Emission reduction calculations were presented in a worksheet /2/ and CTI has assessed the calculations to be complete and transparent.

3.6.5 Comparison of actual emission reductions or net anthropogenic GHG removals by sinks with estimates in the PDD

The emission reductions in this monitoring period are totally 128,410 tCO_2e in the period from 1 January 2012 to 31 March 2014 (i.e. 821 days). The annually expected emission reductions according to the PDD is 67,906 tCO_2e (i.e. 365 days), which corresponds to the emission reductions of 152,742 tCO_2e for this monitoring period (i.e. 821days). Hence, the reported emission reductions are 15.93% lower than the estimation in the PDD.

In this monitoring period, the actual emission reductions in 2012 and 2013 are 45,078 tCO_2e and 69,260 tCO_2e, respectively. During on-site interview and by checking the operation and maintenance records/15/, CTI confirms the power plant has been operated smoothly, there is no equipment overhauled, retrofit/modification occurred during this monitoring period. The reason for the lower emission reductions in 2012 is that the two glass production lines of the glass plant experienced overhauled for 7 and 8 months respectively in 2012, which resulted in the reduction of the wasted heat supply to the power plant and then the electricity generation accordingly, especially one generator of the power plant was shutdown for over 5 months in year 2012. Therefore, the emission reductions in 2012 are lower than the estimation and reasonable to reflect the plant operation practice. The emission reduction in 2013 is just little higher than the estimated value in PDD by 1.99%, the power plant was under full load operation and no overhauled occurred in 2013, it is CTI's opinion the fluctuation is acceptable and reasonable.

The project is a waste energy recovery project for electricity generation. According to the interview with project owner/51/ and the record of glass production/16/, the waste heat production is determined by the glass production and the declined production of glass in this monitoring period caused the decrease of the waste heat production.

Hence, CTI was able to confirm that the emission reductions claimed during this monitoring period 1 January 2012 to 31 March 2014 was reasonable.

3.7 Quality of evidence to determine emission reductions

All necessary documentations are collected, referenced and aggregated, which is easily accessible in hard-copy or electronic format. Measurements are performed by calibrated equipment, and the key data can also be cross-checked via other sources, such as records and inventory data. No assumptions are used that have any material influence on reported emission reductions.

CTI concludes that during this monitoring period, the evidences for determination of emission reductions are sufficient and reasonable, and the calculation of emission reductions is reliable.

3.8 Monitoring of GS Sustainability Indicators

The monitoring plan of GS Passport indicated 10 sustainable indicators to be monitored. CTI assessed the sustainable indicators in the monitoring report (version 3.0 dated 1 September 2014) /1/as per the requirements stated in the Gold Standard Passport/4/.

	Assessment/ Observation
SD indicator 1	Air Quality during construction period
Chosen parameter	Dust development during construction
Target value as per the MP	Potential dust development during construction shall be controlled within the plant area
Assessment of the mitigation measures	N/A As per the validated and approved Gold Standard Passport, air quality during construction period was required to be monitored once upon validation, and was verified by DOE during validation. Hence, the indicator is not involved during verification.
Assessment of monitoring frequency in accordance with the monitoring plan and monitoring methodology	N/A
Assessment of how to verify the reported values in the monitoring report	N/A

	Assessment/ Observation
SD indicator 2	Air Quality during operating period
Chosen parameter	Dust and SO_2 concentration at exhaust pipe
Target value as per the MP	Lower dust concentration is expected
Assessment of the mitigation measures	N/A as per monitoring plan
Assessment of monitoring frequency in accordance with the monitoring plan and monitoring methodology	The monitoring frequency is annually as per the monitoring plan. During on-site visit, CTI verified that the air quality during operation period was measured on 25 December 2011, 22 November 2012 and 15 November 2013 by Environmental Monitoring Station of Shahe City/19//20/. Hence, CTI confirmed the monitoring frequency is in accordance with the monitoring plan and covering this monitoring period.
Assessment of how to verify the reported values in the monitoring report	As indicated in the air quality analysis report /19/, the dust and SO_2 concentration at exhaust pipe were below the allowable limit of the national standard/37/. Hence CTI confirmed the indicator was satisfied.

	Assessment/ Observation
SD indicator 3	Quality of employment
Chosen parameter	Permanent job positions Workplace air quality Fire protection measures
Target value as per the MP	24 (job positions created solely by the PA); The workplace air quality follows national standard (GBJ16-87 and GBZ1-2002); The fire protection equipments are in place, and the employees receive fire protection training.
Assessment of the mitigation measures	N/A as per monitoring plan
Assessment of monitoring frequency in accordance with the monitoring plan and monitoring methodology	The monitoring frequency is annually as per the monitoring plan. During on-site visit, CTI verified: - The HR records of the power plant was recorded in 2012, 2013 and 2014 covering this monitoring period/21/; - The workplace air quality was measured on 6 April 2011, 15 April 2012 and 20 May 2013 by Environmental Monitoring Station of Shahe City/20//22/; - The fire protection equipments were in place and recorded/15/, and the training of the employees regarding safety and operation were conducted on 18 May 2012, 28 April 2013 and 15 March 2014/11/. Hence, CTI confirmed the monitoring frequency is in accordance with the monitoring plan and covering this monitoring period.
Assessment of how to verify the reported values in the monitoring report	CTI confirmed with HR records that the power plant employed 24 employees for operation of the project facilities/21/. This was also verified by interviewing with the staff/51/. For workplace air quality, as indicated in the workplace air quality analysis report/22/,no benzene, sulfur trioxide and hydrogen-fluoride nor toxic gas were detected which meets the targeted national standard GBJ16-87 and GBZ1-2002 /38//39/. During on-site visit, CTI visually verified the fire protection system was in place in the boiler rooms and the power generation rooms appropriately. Also CTI checked the conformity with the certificate of qualification of the plant's fire protection system issued by local safety bureau/38/. CTI also confirmed the training of the employees regarding safety and operation, and the relevant examination to staff with their records/11/.

	Hence CTI confirmed the indicator was satisfied.

	Assessment/ Observation
SD indicator 4	Human and institutional capacity
Chosen parameter	Female employment (number and job related education).
Target value as per the MP	≥ 1
Assessment of the mitigation measures	N/A as per monitoring plan
Assessment of monitoring frequency in accordance with the monitoring plan and monitoring methodology	The monitoring frequency is annually as per the monitoring plan. During on-site visit, CTI verified that the HR records of the power plant were recorded in 2012, 2013 and 2014 covering this monitoring period/21/. Hence, CTI confirmed the monitoring frequency is in accordance with the monitoring plan and covering this monitoring period.
Assessment of how to verify the reported values in the monitoring report	During on-site visit, CTI confirmed with HR records that the power plant employed 3 female employees who were employed under the same salary conditions as male staff/21/, which was also verified with the interview with the staff/51/. This clearly satisfies the future target equals to or more than one staff. CTI also confirmed the training of the employees (both male and female) regarding safety and operation, and the relevant examination to the staff with their records/11/. Hence CTI confirmed the indicator was satisfied.

	Assessment/ Observation
SD indicator 5	Quantitative employment and income generation
Chosen parameter	Number of jobs and income satisfaction rate
Target value as per the MP	Permanent job positions created solely by the PA: Number of jobs: 24 positions The employees are satisfied with the income.
Assessment of the mitigation measures	N/A as per monitoring plan
Assessment of monitoring frequency in accordance with the monitoring plan and monitoring methodology	The monitoring frequency is annually as per the monitoring plan. During on-site visit, CTI verified that the HR records of the power plant were recorded in 2012, 2013 and 2014 covering this monitoring period/21/. Hence, CTI confirmed the monitoring frequency is in accordance with the monitoring plan and covering this monitoring period.
Assessment of how to verify the reported values in the monitoring report	CTI confirmed 24 staffs were employed for the operation of the power plant already argued above /21/, and they were satisfied with their salary by checking the result of employee satisfaction survey in year 2012 and 2013 /24/. Further this was

	confirmed through the interview with the staff during the site visit /51/. Hence CTI confirmed the indicator was satisfied.

	Assessment/ Observation
SD indicator 6	Noise
Chosen parameter	Implementation of noise reduction equipment for generators and protection measures for personnel
Target value as per the MP	The noise reduction equipment and personal protective equipment are implemented. The noise level follows the national standards, i.e. GBJ 87-85 and GB12348-1990.
Assessment of the mitigation measures	As stated in the monitoring plan, the mitigation measure is to install noise reduction equipment and protection measures for personnel. During on-site visit, CTI confirmed that the turbines and generators are covered for noise protection and safety. The operating room of the power plant was separated from the turbines and generators room for air conditioning and noise protection. The boilers are installed inside the boiler house, where usually no operators are stationed and their operating conditions are monitored remotely. Hence CTI confirmed the mitigation measure was placed.
Assessment of monitoring frequency in accordance with the monitoring plan and monitoring methodology	The monitoring frequency is annual as per the monitoring plan. During on-site visit, CTI verified that the noise during operation period was measured on 15 June 2011, 15 April 2012 and 20 June 2013 by Environmental Monitoring Station of Shahe City/20//25/. Hence, CTI confirmed the monitoring frequency is in accordance with the monitoring plan and covering this monitoring period.
Assessment of how to verify the reported values in the monitoring report	For noise analysis, the local environmental protection monitoring station applied the national standard GB12348-2008 which replaced GB12348-1990 since October 2008 and widely used in the industry/40/. As indicated in the noise analysis report/25/, the around the site day and night was below the allowable limit of the national standard/40/. Hence CTI confirmed the indicator was satisfied.

	Assessment/ Observation
SD indicator 7	Water quality
Chosen parameter	Wastewater treatment

Target value as per the MP	Circulating cooling water, boiler blow down water and municipal wastewater properly treated, as per national standards.
Assessment of the mitigation measures	N/A as per monitoring plan
Assessment of monitoring frequency in accordance with the monitoring plan and monitoring methodology	The monitoring frequency is annually as per the monitoring plan. During on-site visit, CTI verified that the water quality was measured on 10 November 2011, 20 November 2012 and 24 November 2013 by Environmental Monitoring Station of Shahe City /20//26/. Hence, CTI confirmed the monitoring frequency is in accordance with the monitoring plan and covering this monitoring period.
Assessment of how to verify the reported values in the monitoring report	As indicated in the water quality analysis report/26/, the quality of discharged wastewater satisfied the national standard/41/. During on-site visit, CTI checked the flow-diagram of the wastewater treatment plant/27/ confirmed that the wastewater treatment system of the power plant was placed, and the wastewater has been treated appropriately. The sewage from the plant has been discharged to the municipal sewage system after the lagoon treatment in the plant site, while the circulating cooling water and the boiler discharge water have been discharged directly to the system without treatment, as being not contaminated. Hence CTI confirmed the indicator was satisfied.

	Assessment/ Observation
SD indicator 8	Air quality of whole glass plant area after the PA
Chosen parameter	Dust and SO_2 concentration in atmosphere
Target value as per the MP	Dust concentration<0.15 mg/m^3, SO_2< 0.30 mg/m^3
Assessment of the mitigation measures	N/A as per monitoring plan
Assessment of monitoring frequency in accordance with the monitoring plan and monitoring methodology	The monitoring frequency is once upon the first verification as per the monitoring plan. The analysis report of air quality of whole glass plant area after the PA on 15 November 2010 and 10 November 2011/28/ has been verified by the first verification/7/. Hence, CTI confirmed the monitoring frequency is in accordance with the monitoring plan and covering this monitoring period.
Assessment of how to verify the reported values in the monitoring report	As indicated in the air quality analysis report/19/, the dust and SO_2 concentration in atmosphere were lower than the target value and satisfied the national

	standards/42/, which was verified during first verification/7/. Hence CTI confirmed the indicator was satisfied.

	Assessment/ Observation
SD indicator 9	Safe and healthy work environment for workers of the whole plant
Chosen parameter	Plant safety regulation and training; Work environment status
Target value as per the MP	The plant safety measures are in place; Work environment is healthy
Assessment of the mitigation measures	N/A as per monitoring plan
Assessment of monitoring frequency in accordance with the monitoring plan and monitoring methodology	The monitoring frequency is annual as per the monitoring plan. The training of the employees regarding safety and operation were conducted on 18 May 2012, 28 April 2013 and 15 March 2014/11/. Hence, CTI confirmed the monitoring frequency is in accordance with the monitoring plan and covering this monitoring period.
Assessment of how to verify the reported values in the monitoring report	During on-site visit, CTI reviewed training records/11/ and interviewed with employee /51/, and confirmed the safe and healthy work environment for workers of the plant has been achieved. CTI also verified the achievement with the certificate of conformance of the safe and healthy working environment issued on 10 August 2012/29/. Hence CTI confirmed the indicator was satisfied.

	Assessment/ Observation
SD indicator 10	Furnace waste refractory brick disposal
Chosen parameter	Furnace waste refractory brick disposal with proper hazardous waste management measures
Target value as per the MP	Status quo ante
Assessment of the mitigation measures	N/A as per monitoring plan
Assessment of monitoring frequency in accordance with the monitoring plan and monitoring methodology	The monitoring frequency is annual as per the monitoring plan. The power plant operation and glass plant manufacturing were recorded daily basis/15//16/. Hence, CTI confirmed the monitoring frequency is in accordance with the monitoring plan and covering this monitoring period.
Assessment of how to verify the reported values in the monitoring report	During on-site visit, CTI reviewed the power plant operation records and glass plant manufacturing records /15//16/, and confirmed there were no furnace waste refractory brick occurred during the

	this monitoring period. CTI also verified the waste brick supply contract has been signed that the waste refractory brick will be sold to the brick supplier for recycling use /30/. Hence CTI confirmed the safe and healthy work environment for workers of the plant has been achieved, and the indicator was satisfied.

3.9 Management and operational system

Hebei Yingxin Glass Group Co. Ltd.is responsible for operation and routine maintenance of power plant. The quality assurance and quality control procedures have been addressed in the GS project management and monitoring manual /12/, including the organization structure with the responsibilities, personnel competencies, monitoring procedures and monitoring management. By interview with the staff /51/ and check records /11/ during on-site visit, it can be confirmed that the monitoring management system is implemented following the GS project management and monitoring manual.

All monitoring devices have been calibrated and maintained periodically to ensure the accuracy of measurement. Calibration records of instruments used in measurements were made available during the verification visit and found to be valid for the entire period of the verification. Competence and training records of in-plant personnel engaged in measurement of plant parameters were presented during verification and found to be in order /11/. All data have been archived electronically and/or in hard copy, and will be kept for two years after the crediting period.

4 VERIFICATION AND CERTIFICATION STATEMENT

Shenzhen CTI International Certification Co., Ltd (CTI) has performed the verification of the emission reductions that have been reported for the GS project activity GS750 "Hebei Yingxin Glass Group Co. Ltd. Glass Furnace Flue Gas Waste Heat to Energy Project" in China for the period 1 January 2012 to 31 March 2014.

The verification is based on the baseline and monitoring methodology ACM0012 (version 3.2), the validated and approved GS-PDD (version 2.0 dated 11 November 2010) and Gold Standard Passport (version 2 dated 8 May 2011), and the monitoring report (version 3.0 dated 1 September 2014). The verification consisted of the following three phases: i) desk review of the project design and the baseline and monitoring plan; ii) follow-up interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final verification and certification report.

The project participants are responsible for the collection, calculation and determination of the GHG data in accordance with the monitoring plan and the reporting of GHG emission reductions on the basis set out within the project monitoring report.

It is CTI's responsibility to provide an independent verification statement on the reported GHG emission reductions for the project. Based on an understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these, CTI planned and performed our work to obtain the information and explanations that we considered necessary to provide reasonable assurance that reported GHG emission reductions are fairly stated.

CTI can confirm that the GHG emission reductions are calculated without material misstatements. Based on the evidence and information that are considered necessary to guarantee that GHG emission reductions are appropriately calculated, CTI confirms that the emission reductions from the "Hebei Yingxin Glass Group Co. Ltd. Glass Furnace Flue Gas Waste Heat to Energy Project" in China during the period 1 January 2012 to 31 March 2014 amount to 128,410 tonnes of CO_2 equivalent. Moreover, CTI confirms all SD indicators and mitigation measures were monitored and implemented in accordance with the validated and approved Gold standard Passport, and thus concludes the project contributes to achieve sustainable development.

Shunrong Lin

Lin Shunrong
Team Leader
2 September 2014

Zhou Lu
Technical Reviewer
2 September 2014

5 REFERENCES

Documentation to verify the information provided by the project participants

/1/ South Pole Carbon Asset Management Ltd.: Monitoring Report for Hebei Yingxin Glass Group Co. Ltd. Glass Furnace Flue Gas Waste Heat to Energy Project for 2nd monitoring period, version 1.0 dated 18 April 2014 , version 2.0 dated 12 June 2014 and version 3.0 dated 1 September 2014.

/2/ South Pole Carbon Asset Management Ltd.: Emission reduction calculation spreadsheet for Hebei Yingxin Glass Group Co. Ltd. Glass Furnace Flue Gas Waste Heat to Energy Project, version 1.0 dated 18 April 2014 and version 3.0 dated 1 September 2014.

/3/ South Pole Carbon Asset Management Ltd.: GS-Project Design Document for project activity Hebei Yingxin Glass Group Co. Ltd. Glass Furnace Flue Gas Waste Heat to Energy Project, version 2.0 dated 11 November 2010.

/4/ South Pole Carbon Asset Management Ltd.: Gold Standard Passport for the project activityHebei Yingxin Glass Group Co. Ltd. Glass Furnace Flue Gas Waste Heat to Energy Project, version 2 dated 8 May 2011.

/5/ ERM Certification and Verification Services: Gold Standard Validation Report, version 02 of 21 July 2011.

/6/ South Pole Carbon Asset Management Ltd.: Monitoring Report for Hebei Yingxin Glass Group Co. Ltd. Glass Furnace Flue Gas Waste Heat to Energy Project for 1st monitoring period, version 3.0 dated 28 May 2012.

/7/ JCI CDM Center Japan Consulting Institute: 1st Gold Standard Verification Report, version 01 dated 22 June 2012.

/8/ Nameplates of turbine and generator units.

/9/ Shahe Power Supply Company: Calibration reports of electricity meters

- Main meter M081 (SN: 006513), issued on 16 October 2011, Certificate No. 20111016002;
- Main meter M091(SN: 006519), issued on 16 October 2011, Certificate No. 20111016001;
- Back up meter M041(SN: 500005), issued on 16 October 2011. Certificate No. 20111016003;
- Back up meter M051(SN: 500001), issued on 16 October 2011, Certificate No. 20111016004;
- Glass plant fan line meter M045 (SN: 550476), issued on 13 September 2011; Certificate No. 20111016011
- Meter M040(SN: 500004), issued on 16 October 2011, Certificate No. 20111013005;
- Meter M050(SN: 500006), issued on 16 October 2011, Certificate No. 20111016006.

/10/ Bureau of Technical Supervision of Xingtai City: Ceritificate of Metrological Authorization for Special Items of Shahe Power Supply Company.

/11/ Hebei Yingxin Glass Group Co. Ltd.: Training record related to operation, monitoring and safety dated 18 May 2012, 28 April 2013 and 15 March 2014; and relevant examination record.

/12/ Hebei Yingxin Glass Group Co. Ltd.: Management and Monitoring manual.

/13/ Hebei Yingxin Glass Group Co. Ltd.: Power Plant Safety Operation Manual.

/14/ Swiss Carbon Assets Ltd. and Anhui Power Supply Company: Power Purchase Agreement in 2011 and 2012.

/15/ Hebei Yingxin Glass Group Co. Ltd.: Daily operational and maintenance records for the project from 2012 to 2014.

/16/ Hebei Yingxin Glass Group Co. Ltd.: Glass Plant Manufacturing Records from 2012 to 2014.

/17/ Hebei Yingxin Glass Group Co. Ltd.: Original data record of electricity imported and exported, and electricity generation for the period 1 January 2012 to 31 March 2014.

/18/ Environmental Monitoring Station of Shahe City: Air Quality Analysis Report during construction period, dated 15 June 2009.

/19/ Environmental Monitoring Station of Shahe City: Air Quality Analysis Report during operation period, dated 25 December 2011, 22 November 2012 and 15 November 2013.

/20/ Bureau of Technical Supervision of Hebei Province: Certificate for Measurement Attestation of Environmental Monitoring Station of Shahe City.

/21/ Hebei Yingxin Glass Group Co. Ltd.: HR records in 2012, 2013 and 2014.

/22/ Environmental Monitoring Station of Shahe City: Workplace Air Quality Analysis Report, dated 6 April 2011, 15 April 2012 and 20 May 2013.

/23/ Shahe city Fire Protection and Public Safety Bureau: Qualification Certificate of Fire Protection System, 1 June 2011.

/24/ Hebei Yingxin Glass Group Co. Ltd.: Employ Satisfaction Survey Responses.

/25/ Environmental Monitoring Station of Shahe City: Noise Analysis Report, dated 15 June 2011, 15 April 2012 and 20 June 2013.

/26/ Environmental Monitoring Station of Shahe City: Water Quality Analysis Report, dated 10 Novermber 2011, 20 November 2012 and 24 November 2013.

/27/ General drawing of the plant layout.

/28/ Environmental Monitoring Station of Shahe City: Analysis Report For Air Quality Of Whole Glass Plant Area After The PA, dated 15 November 2010 and 10 Novermber 2011.

/29/ Fangyuan Certification Group Limited: Certificate of Conformance of the Safe and healthy Working Environment, 10 August 2012 valid till 9 August 2015.

/30/ Hebei Yingxin Glass Group Co. Ltd.: Waste brick supply contract with brick supplier.

/31/ Department of Industry and Transport Statistics of National Statistics Bureau and Energy Bureau of NDRC of China: China Energy Statistical Yearbook 2011.

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/40/ General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China: Emission Standard For Industrial Enterprises Noise At Boundary GB12348-2008, 1 October 2008.

/41/ General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China: Integrated Wastewater Discharge Standard GB8978-1996, 4 October 1996.

/42/ General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China: Integrated Emission Standard Of Air Pollutants GB16297-1996, 12 April 1996.

Methodologies, tools and other guidance by the CDM Executive Board and Gold Standard rules

/43/ CDM Executive Board: Clean Development Mechanism Validation and Verification Standard.

/44/ CDM Executive Board: Clean Development Mechanism Project Standard.

/45/ CDM Executive Board: Clean Development Mechanism Project Cycle Procedure.

/46/ CDM Executive Board: Consolidated baseline methodology for GHG emission reductions from waste energy recovery projects, ACM0012, version 3.2.

/47/ CDM Executive Board: Tool to calculate the emission factor for an electricity system, version02.

/48/ CDM Executive Board: Guideline-Completing the monitoring report form.

/49/ Gold Standard Requirement, version 2.1.

/50/ Gold Standard Toolkit and its Annexes, version 2.1.

Persons interviewed

/51/ Hebei Yingxin Glass Group Co. Ltd.:
Chen Xupo, Director of power plant
Zhang Ziyan, Electrical technician of power plant
Zhang Yanjie, Electrical and mechanical maintenance worker of power plant

/52/ South Pole Carbon Asset Management Ltd.:
Duan Zhijie, Project manager
Yang Xuan, Head of implementation China

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APPENDIX A

REMAINING ISSUES FROM PREVIOUS VALIDATION/VERIFICATION

Table A-1 Forward Action Requests (FARs) in the Previous Validation/Verification

Description	Summary from project participant	Verification team conclusion
FAR 1: Keeping all the documents in a file relevant to meter calibration and maintenance. For better preparations for next verification, it was recommended keeping all the documents relevant to meter calibration in a file.	All documents related to meter calibration and maintenance has been kept in a file, and presented to DOE during this monitoring period.	During the on-site visit, CTI verified all documents of meter calibration and maintenance, and confirmed required documents were classified and kept well in file. Hence, CTI confirmed FAR 1 was solved.
FAR 2: Preparation of the guidelines of the allowable gap for the cross checks of electricity monitoring data. Power generation data monitored at the power plant were cross checked every day with the corresponding data monitored at the glass plant data. However, there were no guidelines of the allowable limit of the gap between the two kinds of data specified to assess the cross check result.	Detailed clarification referred to CL 1.	During the verification, CTI found the MR did not clearly describe the guideline of line loss. Hence, CL 1 was raised corresponding to FAR 2. For detailed response from PP and CTI conclusion please refer to CL 1 in Appendix B, Table 2, Resolution of corrective action requests and clarification requests below. The resolution of CL 1 concluded that FAR 2 was closed.

APPENDIX B

GS VERIFICATION PROTOCOL

Table 1: Verification requirements

Checklist questions		Ref.	MoV*	Verification findings	Draft Concl.	Final Concl.
1.	**General checklist**					
1.1	Is the MR template valid?	/48/	DR	Yes. The latest version of MR template has been applied.	OK	OK
1.2	Have all open issues identified in the validation report and/or previous verification report been resolved by the project participant?	/5/ /7/	DR	This monitoring period 1 January 2012 to 31 March 2014 is the second verification of the project. 2 FARs were identified in the first verification. For FAR1, during on-site visit, CTI confirmed all the documents relevant to meter calibration were kept in a file properly. So FAR1 is solved. As per the verification report for 1st monitoring period, a FAR was raised as "*Preparation of the guidelines of the allowable gap for the cross check of electricity monitoring data Power generation data monitored at the power plant were cross checked every day with the corresponding data monitored at the glass plant data. However, there were no guidelines of the allowable limit of the gap between the two kinds of data specified to assess the cross check result.*" However, the MR did not clearly describe the guideline of line loss. Hence, clarification is sought with evidence.	~~CL1~~	OK

MoV = Means of Verification, DR= Document Review, I= Interview

2.	**Verification Compliance**					
2.1	Has the implementation and operation of the project activity has been conducted in accordance with the description contained in the registered GS-PDD?	/3/	DR /I	As per the "Guidelines for completing the monitoring report form", the following information need to be clarified: 1) Type of the crediting period, and start date and length of this monitoring period in A.5. of MR 2) Description of the project technology (ies) and equipment needs to be clarified in section B.1. of the MR.	~~CL 2~~	OK
2.2	Has any deviation or the proposed or actual changes in the implementation or operation of the project activity? Does the change comply with the requirements of the Project Standard?	/3/ /5/	DR /I	There were no post registration changes identified by CTI to this monitoring period.	OK	OK
2.3	If the project activity is implemented on a number of different locations, has the Monitoring report provided the verifiable starting dates for each site?	/3/	DR /I	The project is a waste energy recovery power plant for glass production lines, located in Donghuan Road, Shahe City (county-level city), Xingtai City, Hebei Province, China. There was only one project site.	OK	OK
3.	**Monitoring methodology**					
3.1	Is the monitoring plan established in accordance with the monitoring methodology?	/3/ /5/ /46/	DR /I	CTI is able to confirm that the monitoring plan in the PDD (version 2.0 dated 11 November 2010) is in accordance with the approved methodology applied by the project activity, i.e. ACM0012 (version 3.2).	OK	OK

3.2	In case the implemented monitoring plan defers from the monitoring methodology, has any requests for revision to or deviation from the monitoring methodology been officially communicated to the GS Foundation?	/3/ /5/ /46/	DR /I	There were no post registration changes identified by CTI to this monitoring period.	OK	OK
3.2.1	Have the above changes to the monitoring plan been approved by the GS Foundation?	/3/ /5/ /46/	DR /I	There were no post registration changes identified by CTI to this monitoring period.	OK	OK
4.	**Monitoring plan regarding GHG emission reductions**					
4.1	Is monitoring established in full compliance with the monitoring plan, contained in the registered GS-PDD (or new monitoring plan approved by the GS Foundation)?	/3/ /5/ /46/	DR /I	The monitoring has been carried out in accordance with the monitoring plan contained in the GS-PDD (version 2.0 dated 11 November 2010). CTI confirms that all parameters stated in the monitoring plan are monitored and reported appropriately. All parameters required to be monitored by the monitoring plan as per the monitoring methodology ACM0012 (version 3.2), and the management system were assessed during the site visit.	OK	OK
4.2	Are all emission parameters monitored and updated in accordance with monitoring plan, monitoring methodology and relevant CDM EB decisions?	/3/ /5/ /46/	DR /I	All parameters required to be monitored by the monitoring plan as per the monitoring methodology ACM0012 (version 3.2), and the management system were assessed during the site visit.	OK	OK
4.2.1	Was the monitoring equipment for emission parameters controlled and monitoring results recorded as per approved frequency?	/3/ /9/ /46/	DR /I	During on-site visit, and by checking calibration certificates, it was found the accuracy for meters M050, M040,	~~CAR 1~~	OK

			M051 and M041 are 0.2S, and for M081 and M091 are 0.5S. However, in MR the accuracy was typo as 0.2 for M050, M040, M051 and M041, and 0.5 for M081 and M091. Hence, a correction is requested.		
4.2.2 Was the monitoring equipment for emission parameters calibrated in accordance with QA&QC procedures described in the registered monitoring plan?	/3/ /9/ /46/	DR /I	During the on-site visit, all the calibration records were reviewed. Meters M091, M081, M051 and M041 were calibrated on 16 October 2011, and meter M045 was calibrated on 13 September 2011 respectively. The calibration certificates for all meters are valid for 5 years which meets the requirement from the relevant national standard and reflects to the monitoring practice of China. However, as stated in the GS-PDD the calibration frequency is once a year. Hence, the calibration had not been conducted appropriately as per the monitoring plan, which cannot cover the whole monitoring period 1 January 2012 to 31 March 2014. As a result, there is a delay from 16 October 2012 ~ 31 March 2014 for M091, M081, M051 and M041 and from 13 September 2012 to 31 March 2014 for M045 during this monitoring period. Hence, a clarification is sought.	~~CL 3~~	OK
4.2.3 If during verification of a certain monitoring period, the calibration has been delayed and	/3/ /9/	DR /I	Refer to section 4.2.2	~~CL 3~~	OK

the calibration has been implemented after the monitoring period in consideration (i.e. the results of delayed calibration are available), how to calculate emission reductions in a conservative approach?	/46/				
4.2.4 In cases where the results of the delayed calibration are not available, or the calibration has not been conducted at the time of verification, how to calculate emission reductions in a conservative approach?	/3/ /9/ /46/	DR /I	Refer to section 4.2.2	~~CL 3~~	OK
4.2.5 In cases, it is not possible for the project participants to conduct the calibration at a frequency specified by either the applied methodology, guidance provided by the Board, and/or the registered monitoring plan due to reasons beyond the control of project participants, how to calculate emission reductions in a conservative approach?	/3/ /9/ /46/	DR /I	Refer to section 4.2.2	~~CL 3~~	OK
4.2.6 In cases where neither the monitoring methodology nor the monitoring plan specify any requirements for calibration frequency for measuring equipments, how to identify the calibration frequency?	/3/ /9/ /46/	DR /I	Refer to section 4.2.2	~~CL 3~~	OK
4.3 Were all monitoring parameters available and verifiable through the whole monitoring period?	/3/ /9/ /46/	DR /I	Refer to section 4.2.	~~CL 3~~	OK
4.4 Was management and operation system established and operated in accordance with the monitoring plan?	/11/ /12/ /51/	DR /I	As per the verification report for 1st monitoring period, a FAR was raised as "*Preparation of the guidelines of the*	~~CL 1~~	OK

			allowable gap for the cross check of electricity monitoring data Power generation data monitored at the power plant were cross checked every day with the corresponding data monitored at the glass plant data. However, there were no guidelines of the allowable limit of the gap between the two kinds of data specified to assess the cross check result." However, the MR did not clearly describe the guideline of line loss. Hence, clarification is sought with evidence.		
4.5 Was is it possible to verify that involved management and operation personal is fully aware of the responsibilities and perform all operations according to the registered monitoring plan and internally developed manuals?	/11/ /12/ /51/	DR /I	Hebei Yingxin Glass Group Co. Ltd. is responsible for operation and routine maintenance of power plant under the GS activity. The quality assurance and quality control procedures have been addressed in the GS project management and monitoring manual, including the organization structure with the responsibilities, personnel competencies, monitoring procedures and monitoring management. By interview with the staff and check records during on-site visit, it can be confirmed that the monitoring management system is implemented following the CDM project management and monitoring manual.	OK	OK
5. Parameters for GHG emission reductions					

5.1	**Monitored parameter** Title: $EG_{export,y}$ Indication: Electricity exported by the project activity to the plant	/2/ /3//17/	DR /I	The amount of electricity export is determined by monitoring meter on the daily measurement and monthly record. During the on-site visit, all the calibration records were reviewed. Meters M091 and M081 were calibrated on 16 October 2011, and meter M045 was calibrated on 13 September 2011 respectively. The calibration certificates for all meters are valid for 5 years which meets the requirement from the relevant national standard and reflects to the monitoring practice of China. However, as stated in the GS-PDD the calibration frequency is once a year. The calibration of monitoring meters had not been conducted appropriately once a year as per the monitoring plan, which cannot cover the whole monitoring period 1 January 2012 to 31 March 2014. As a result, there is a delay from 16 October 2012 ~ 31 March 2014 for M081 and M091 and from 13 September 2012 to 31 March 2014 for M045 during this monitoring period. Hence, the clarification is sought for these delay calibrations.	~~CL3~~	OK
	Monitored parameter Title: $EC_{import,y}$	/2/ /3/	DR /I	The amount of electricity export is determined by monitoring meter on the daily measurement and monthly record.		OK

Indication: Electricity imported by the Project activity to the plant	/17/		During the on-site visit, all the calibration records was reviewed. Meters M091 and M081 were calibrated on 16 October 2011. The calibration certificates for all meters are valid for 5 years which meets the requirement from the relevant national standard and reflects to the monitoring practice of China. However, as stated in the GS-PDD the calibration frequency is once a year. The calibration of monitoring meters had not been conducted appropriately once a year as per the monitoring plan, which cannot cover the whole monitoring period 1 January 2012 to 31 March 2014. As a result, there is a delay from 16 October 2012 ~ 31 March 2014 for M081 and M091 during this monitoring period. Hence, the clarification is sought for these delay calibrations.	~~CL 3~~	
Monitored parameter Title: EG_y Indication: Net electricity output by the project activity	/2/ /3/ /17/	DR /I	The net electricity supplied to the grid is determined by the electricity export to the glass plant and glass plant fan minus the electricity import. The amount of net electricity is determined by monitoring meter on the hourly and daily basis when the power plant is operating, and these daily readings are aggregated into monthly reports.		OK

			During the on-site visit, all the calibration records were reviewed. Meters M091 and M081 were calibrated on 16 October 2011, and meter M045 was calibrated on 13 September 2011 respectively. The calibration certificates for all meters are valid for 5 years which meets the requirement from the relevant national standard and reflects to the monitoring practice of China. However, as stated in the GS-PDD the calibration frequency is once a year. The calibration of monitoring meters had not been conducted appropriately once a year as per the monitoring plan, which cannot cover the whole monitoring period 1 January 2012 to 31 March 2014. As a result, there is a delay from 16 October 2012 ~ 31 March 2014 for M081 and M091 and from 13 September 2012 to 31 March 2014 for M045 during this monitoring period. Hence, the clarification is sought for these delay calibrations. As per the verification report for 1st monitoring period, a FAR2 was raised as "Preparation of the guidelines of the allowable gap for the cross check of electricity monitoring data Power generation data monitored at the power	~~CL 3~~ ~~CL 1~~	

			plant were cross checked every day with the corresponding data monitored at the glass plant data. However, there were no guidelines of the allowable limit of the gap between the two kinds of data specified to assess the cross check result." However, the MR did not clearly describe the guideline of line loss. Hence, clarification is sought with evidence.		
Monitored parameter Title: $Q_{OE,y}$ Indication: Quantity of total electricity generation	/2/ /3/ /17/	DR /I	The amount of electricity export is determined by monitoring meter on the daily measurement and monthly record. During the on-site visit, all the calibration records were reviewed. Meters M040 and M050 for monitoring $Q_{OE,y}$ were calibrated on 16 October 2011. The calibration certificates for both meters are valid for 5 years which meets the requirement from the relevant national standard and reflects to the monitoring practise of China. However, as stated in the GS-PDD the calibration frequency is once a year. Hence, the calibration had not been conducted appropriately as per the monitoring plan, which cannot cover the whole monitoring period 1 January 2012 to 31 March 2014. As a result, there is a delay from 16 October 2012 ~ 31 March 2014 for M040 and M050 during this monitoring period. Hence,	~~CL 3~~	OK

			the clarification is sought for these delay calibrations.		
5.2 **Ex-ante parameter** Title: $EF_{grid,CM,y}$ Indication: Baseline emission factor of NCPG	/3/	DR	In the PDD, the ex-ante determined emission factor 0.8935 tCO_2/MWh for the NCPG is applied during the first crediting period (including this monitoring period).	OK	OK
Ex-ante parameter Title: $Q_{OE, BL}$ Indication: Output energy (electricity) that can be theoretically produced	/3/	DR	Output energy (electricity) that can be theoretically produced (in MWh) is determined on the basis of maximum recoverable energy from the WECM, which would have been released (or WECM would have been flared or energy content of WECM would have been wasted) in the absence of project activity (*QOE, BL*). As per the GS-PDD, the value of 86,400 MWh for a year for $Q_{OE,BL}$ is applied in the calculation of $f_{cap.}$	OK	OK
6. Calculations					
6.1 Have all the calculations related to the baseline emissions been carried according to the formulae and methods described in the registered GS-PDD and applied methodology?	/1/ /2/ /3/ /46/	DR /I	Baseline emissions ($BE_{Elec,y}$ in tCO2) are the product of the baseline emissions factor ($EF_{grid,CM,y}$ in tCO_2/MWh) times the net electricity supplied by the project activity (EG_y in MWh), which will otherwise be supplied by the NCPG without the project activity. As per the methodology ACM0012 (version 3.2), the f_{cap} is determined by $Q_{OE,BL}/Q_{OE,y}$. However, by checking the	~~CAR 1~~	OK

			ER calculation sheet, it was found the f_{cap} in yea 2012, 2013 and 2014 during this monitoring period was incorrectly calculated by $Q_{OE,BL}/EG_y$. And the f_{cap} in year 2013 is less than 1 in fact. Hence, a correction is requested.		
6.2 Have all the calculations related to the project emissions been carried according to the formulae and methods described in the registered PDD and applied methodology?	/1/ /2/ /3/ /46/	DR	Project emissions (PE_y) are not considered because the project doesn't utilizes auxiliary fossil fuel, and auxiliary electricity consumption by the project activity will be deducted from gross electricity generated by the project.	OK	OK
6.3 Have all the calculations related to the leakage emissions been carried according to the formulae and methods described in the registered PDD and applied methodology?	/1/ /2/ /3/ /46/	DR	According to ACM0012 (version 3.2), leakage (LE_y) is not to be considered.	OK	OK
7. Sustainability Monitoring					
7.1 Is monitoring established in full compliance with the monitoring plan, contained in the registered Passport (or new monitoring plan approved by the GS Foundation)?	/1/ /4/ /49/ /50/	DR	The monitoring has been carried out in accordance with the monitoring plan contained in the Passport (version 2 dated 8 May 2011). CTI confirms that all parameters stated in the monitoring plan are monitored and reported appropriately. All parameters required to be monitored by the monitoring plan as per Passport and GS rules, and the management system was assessed during the site visit.	OK	OK
7.2 Does the monitoring report contain all	/1/	DR	All required indicators/parameters were	OK	OK

	indicators/parameters required for monitoring sustainability of the project activity specified in the monitoring plan?	/4/ /49/ /50/		monitored as per Passport and their results are reported in the monitoring report.		
8. Indicators for Sustainability Monitoring						
8.1	Air quality during construction period	/1/ /4/ /7/ /49/ /50/	DR	As per the Passport, air quality during construction period needs to be monitored once upon validation.	OK	OK
8.2	Air Quality during operating period	/1/ /4/ /49/ /50/	DR	As per the Passport, Air quality during operation needs to be monitored annually; however, the MR was silence about the monitoring certificate on 25 November 2011. Hence, related certificate needs to be clarified in the MR to show the monitoring frequency is in line with the MR and covers this monitoring period.	~~CL 4~~	OK
8.3	Quality of employment	/1/ /4/ /49/ /50/	DR	As per the Passport Quality of employment needs to be monitored annually, however, the MR was silence about the certificate of workplace air quality on 4 June 2011. Hence, related certificate needs to be clarified in the MR to show the monitoring frequency is in line with the MR and covers this monitoring period.	~~CL 4~~	OK
8.4	Human and institutional capacity	/1/ /4/ /49/	DR	The monitoring frequency is annually as per the monitoring plan. During on-site visit, CTI verified that the HR	OK	OK

	/50/		records of the power plant were recorded in 2012, 2013 and 2014 covering this monitoring period. CTI also confirmed with HR records that the power plant employed 3 female employees who were employed under the same salary conditions as male staff, which was also verified with the interview with the staff. This clearly satisfies the future target equals to or more than one staff. CTI also confirmed the training of the employees (both male and female) regarding safety and operation, and the relevant examination to the staff with their records. Hence, CTI confirmed the monitoring frequency is in accordance with the monitoring plan and covering this monitoring period, and the indicator was satisfied.		
8.5 Quantitative employment and Income generation	/1/ /4/ /49/ /50/	DR	The monitoring frequency is annually as per the monitoring plan. During on-site visit, CTI verified that the HR records of the power plant were recorded in 2012, 2013 and 2014 covering this monitoring period. CTI also confirmed 24 staffs were employed for the operation of the power plant already argued above, and they were satisfied with their salary by checking the result of employee	OK	OK

			satisfaction survey in year 2012 and 2013. Further this was confirmed through the interview with the staff during the site visit. Hence, CTI confirmed the monitoring frequency is in accordance with the monitoring plan and covering this monitoring period, and the indicator was satisfied.		
8.6 Noise	/1/ /4/ /49/ /50/	DR	As per the Passport noise needs to be monitored annually, however, the MR was silence about the monitoring certificate on 15 June 2011. Hence, related certificate needs to be clarified in the MR to show the monitoring frequency is in line with the MR and covers this monitoring period. For sustainable indicator "noise", in the registered PDD, the national standards, i.e. GBJ87-85 and GB12348-1990 were referred to. However, as showed in MR the monitoring certificate for noise was followed the standard GB12348-2008. Hence, a clarification is sought.	~~CL 4~~ ~~CL 5~~	OK
8.7 Water quality	/1/ /4/ /49/ /50/	DR	As per the Passport water quality needs to be monitored annually, however, the MR was silence about the monitoring certificate on 10 November 2011. Hence, related certificate needs to be clarified in the MR to show the monitoring frequency is in line with the	~~CL 4~~	OK

			MR and covers this monitoring period.		
8.8 Air quality of whole glass plant area after the PA	/1/ /4/ /49/ /50/	DR	As stated in the Passport, air quality of whole glass plant area after the PA will be monitored once upon the first verification, but the MR was silence about the monitoring certificate in 2010 and 2011 during the first monitoring period. Hence, the above certificates need to be clarified in the MR to show the monitoring frequency is in line with the MR and covers this monitoring period.	~~CL 4~~	OK
8.9 Safe and healthy work environment for workers of the whole plant	/1/ /4/ /49/ /50/	DR	The monitoring frequency is annually as per the monitoring plan. The training of the employees regarding safety and operation were conducted on 18 May 2012, 28 April 2013 and 15 March 2014. During on-site visit, CTI reviewed training records and interviewed with employee, and confirmed the safe and healthy work environment for workers of the plant has been achieved. CTI also verified the achievement with the certificate of conformance of the safe and healthy working environment issued on 10 August 2012. Hence, CTI confirmed the monitoring frequency is in accordance with the monitoring plan and covering this monitoring period, and the indicator was satisfied.	OK	OK

8.10 Furnace waste refractory brick disposal	/1/ /4/ /49/ /50/	DR	The monitoring frequency is annually as per the monitoring plan. The power plant operation and glass plant manufacturing were recorded daily basis. Hence, CTI confirmed the monitoring frequency is in accordance with the monitoring plan and covering this monitoring period. During on-site visit, CTI reviewed the power plant operation records and glass plant manufacturing records, and confirmed there were no furnace waste refractory brick occurred during the this monitoring period. CTI also verified the waste brick supply contract has been signed that the waste refractory brick will be sold to the brick supplier for recycling use. Hence, CTI confirmed the safe and healthy work environment for workers of the plant has been achieved, and the indicator was satisfied.	OK	OK

Table 2 Resolution of corrective action requests and clarification requests

CAR/CL requests by verification team	Responses from project participant	Verification team conclusion
CAR 1: The following errors in the MR and ERs calculation sheet shall be corrected: 1. As per the methodology ACM0012 (version 3.2), the f_{cap} is determined by $Q_{OE,BL}/Q_{OE,y}$. However, by checking the ER calculation sheet, it was found the f_{cap} in yea 2012, 2013 and 2014 during this monitoring period was incorrectly calculated by $Q_{OE,BL}/EG_y$. And the f_{cap} in year 2013 is less than 1 in fact. 2. During on-site visit, and by checking calibration certificates, it was found the accuracy for meters M050, M040, M051 and M041 are 0.2S, and for M081 and M091 are 0.5S. However, in MR the accuracy was typo as 0.2 for M050, M040, M051 and M041, and 0.5 for M081 and M091. Hence, a correction is requested.	Corrections have been made for the calculation of f_{cap} in year 2012, 2013 and 2014 as per the methodology ACM0012 (version 3.2). The f_{cap} in year 2012 and 2014 is 1 and the f_{cap} in year 2013 is 0.98. Please see the revised ER calculation sheet and MR. The accuracy of M050, M040, M051, M041, M081 and M091 are corrected in the revised MR as request.	The relevant corrections have been made in the updated MR and ERs calculation sheet, and verified by CTI. CAR 1 is closed.
CL 1: As per the verification report for 1st monitoring period, a FAR was raised as "*Preparation of the guidelines of the allowable gap for the cross check of electricity monitoring data Power generation data monitored at the power plant were cross checked every day with the corresponding data monitored at the glass plant data.*	Theoretical line loss and actual line loss are calculated separately. Theoretical line loss is calculated based on the equipment parameters of electricity transmission line, and actual line loss is calculated based on actual meter readings during this monitoring period. Results show that actual line loss is all below theoretical line loss. The result table and corresponding description	During on-site visit, CTI confirmed meters M051 and M041 which were installed at power plant are the backup meters for cross checking the net electricity measured by main meter M091 and M081. There are four lines between generation side (M041 and M051) and recipient side (M081 and M091), two parallel lines connected M051 and M091 (line M051-M091), and two parallel

CAR/CL requests by verification team	Responses from project participant	Verification team conclusion
However, there were no guidelines of the allowable limit of the gap between the two kinds of data specified to assess the cross check result." However, the MR did not clearly describe the guideline of line loss. Hence, clarification is sought with evidence.	have been added in MR. Detailed calculation processes can be seen in the ER calculation spreadsheet.	lines connected M041 and M081 (line M041-M081). Based on monitoring data on daily basis and aggregated monthly, the actual line loss for line M051-M091 and line M041-M081 are 0.36% and 0.35%, respectively, in year 2012, 2013 and 2014. The calculation measure for theoretical line loss has been provided in the revised ERs spreadsheet. The result show the theoretical line loss for line M051-M091 for year 2012, 2013 and 2014 (January to March) are 0.40%, 0.79% and 0.54, respectively, at average of 0.59%. For line M041-M081, the theoretical line loss is 0.61%, 0.74% and 0.67% respectively, at average of 0.68%. CTI has verified the calculation of line loss, and confirmed the actual line loss is below the theoretical values. Hence, the small gap is considered reasonable and normal, and the guideline of line loss described in the MR is acceptable by CTI. CL 1 and corresponding FAR 2 are closed.
CL 2: As per the "Guidelines for completing the monitoring report form", the following information need to be clarified:	As per the "Guidelines for completing the monitoring report form": 1) Type of the crediting period, and start	The required information has been reported in the revised MR according to the "Guidelines for

CAR/CL requests by verification team	Responses from project participant	Verification team conclusion
1. Type of the crediting period, and start date and length of this monitoring period in A.5. of MR 2. Description of the project technology(ies) and equipment needs to be clarified in section B.1. of the MR.	date and length of this monitoring period have been clarified in A.5. of the revised MR. 2) Description of the project technology(ies) and equipment has been provided in section B.1. of the revised MR.	completing the monitoring report form", and verified by CTI. CL 2 is closed.
CL 3: For meters M091, M081, M050, M040, M051 and M041, they were calibrated on 16 October 2011, and meter M045 was calibrated on 13 September 2011 respectively. Since their calibration frequency was once per year according to the MP of the GS-PDD and MR, it resulted in delay during this monitoring period from 16 October 2012 ~ 31 March 2014 for M091, M081, M050, M040, M051 and M041, and from 13 September 2012 to 31 March 2014 for M045. The clarification is sought for these delay calibrations.	The calibrations for these meters are all in accordance with the requirements of "Verification Regulation of Electrical Energy Meters with Electronics" (JJG596-1999). These meters have been most recently calibrated respectively on 16 October 2011 (for M091, M081, M050, M040, M051 and M041) and on 13 September 2011 (for M045), with their calibrations valid respectively until 15 October 2016 and 12 September 2016. It is clear that the valid periods of meters calibrations cover the whole monitoring period of the project activity (from 1 January 2012 to 31 March 2014) and the five-year calibration frequency is also in accordance with the requirement of JJG596-1999. But according to the MP of the GS-PDD and MR, meter calibration frequency should be once per year. A conservative approach has been adopted in the calculation of emission reductions for the project activity: Emission reductions can be discounted by	During the on-site visit, all the calibration records was reviewed. Meters M091, M081, M040, M050, M051 and M041 were calibrated on 16 October 2011, and meter M045 was calibrated on 13 September 2011 respectively. The calibration certificates for all meters are valid for 5 years which meets the requirement from the relevant national standard and reflects to the monitoring practice of China. However, as stated in the GS-PDD the calibration frequency is once a year. The calibration had not been conducted appropriately as per the monitoring plan. Since main meters M091 and M08, and glass plant fan line meter M045 directly monitored electricity export and import. Therefore, to assess the time gap of calibrations, the maximum permissible error (the accuracy) of the instruments was used to decrease the measured values taken for the electricity export, while to increase the measured values taken for the electricity import. For meters M081 and M091,

CAR/CL requests by verification team	Responses from project participant	Verification team conclusion
	applying the maximum permissible error of the electricity meters measuring electricity values. Here the full accuracy level (0.5% for meters M091, M081 and M045) of the electricity meter is applied to the deduction from the electricity supplied to the grid (-0.5% for exports) as well as the increase to the electricity imported from the grid (+0.5% for imports); for calculation of f_{cap}, the full accuracy level of 0.2% for meters M050 and M040 is applied to the increase of total electricity generated by the two generators ($Q_{OE,y}$). So that the net electricity values claiming for emission reductions, which are calculated by deducting electricity imported from electricity exported, will be conservative; and the f_{cap} determined by $Q_{OE,BL}/Q_{OE,y}$ will be also conservative. Corresponding parts have been revised. Please see the revised ER calculation sheet and MR.	the accuracy 0.5S (0.5%) was applied for this monitoring period. For meter M045 the accuracy 0.5(0.5%) was applied. Meters M050 and M040 are used to directly monitor electricity generation ($Q_{OE,y}$) for determining $f_{cap.}$ Therefore, to assess the time gap of calibrations, the maximum permissible error (the accuracy) of the instruments was used to increase the measured values taken for the electricity generation. The accuracy 0.2S (0.2%) was applied this monitoring period. The revised value has been made in the updated MR and ERs calculation sheet which is conservative, and verified by CTI. CL 3 is closed.
CL 4: As per the Passport of the project, the following SD indicators need to be monitored annually, however: - Air quality during operation: the MR was silence about the monitoring certificate on 25 November 2011; - Quality of employment: the MR was silence about the certificate of workplace air quality on 4 June 2011; - Noise: the MR was silence about the monitoring certificate on 15 June 2011;	- The monitoring certificate on 25 November 2011 for air quality during operation has been added in the revised MR; - The monitoring certificate of workplace air quality on 4 June 2011 has been added in the revised MR; - The monitoring certificate of noise on 15 June 2011 has been added in the revised MR; - The monitoring certificate of water quality on 10 November 2011 has been added in the	The related certificates have been added in the revised MR, which clearly demonstrates the monitoring frequency is in line with the MR and covers this monitoring period. CL 4 is closed.

CAR/CL requests by verification team	Responses from project participant	Verification team conclusion
- Water quality: the MR was silence about the monitoring certificate on 10 November 2011 And for "Air quality of whole glass plant area after the PA", as stated in the Passport, it will be monitored once upon the first verification, but the MR was silence about the monitoring certificate in 2010 and 2011 during the first monitoring period. Hence, the above certificates need to be clarified in the MR to show the monitoring frequency is in line with the MR and covers this monitoring period.	revised MR. For "Air quality of whole glass plant area after the PA", as per the statement in the Passport, it would be monitored once upon the first verification; actually, the monitoring certificates of 2010 and 2011 have already been reviewed by DOE during the first verification monitoring period, so here the two certificates in 2010 and 2011 have not needed to be shown.	
CL 5: For sustainable indicator "noise", in the registered PDD, the national standards, i.e. GBJ 87-85 and GB12348-1990 were referred to. However, as showed in MR the monitoring certificate for noise was followed the standard GB12348-2008. Hence, a clarification is sought.	The local environmental protection monitoring station has followed the national standard of GB12348-1990, which is a national standard and widely used in the industry. This standard was replaced with GB12348-2008 since October 2008. So here in MR the standard GB12348-2008 is referred. (http://wenku.baidu.com/link?url=Zavvo_R8euo2nMpHCKL5FKT0iuhVseuoV8wR8cmxnV8gwnZZdS9Ri3-3x8-22zz4aysCainroJoktCz3a1XmryddHTTt5vbicvtZ_cK0uLq)	During on-site visit, CTI confirmed the the local environmental protection monitoring station applied the national standard GB12348-2008 which replaced GB12348-1990 since October 2008 and widely used in the industry. The clarification has been made in the revised MR. CL 5 is closed.

Table 3 Forward action requests from this verification

Forward action request by verification team	Summary of project participant response	Verification team conclusion
NA	NA	NA

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APPENDIX C

MAIN QUESTIONS DISCUSSED DURING ON-SITE INTERVIEW

Main questions discussed during interview	Interviewee	Feedback from interviewees
Introduction of the project	**Hebei Yingxin Glass Group Co. Ltd.:** Chen Xupo: Director of power plant Zhang Ziyan: Electrical technician of power plant Zhang Yanjie, Electrical and mechanical maintenance worker of power plant **South Pole Carbon Asset Management Ltd.:** Duan Zhijie, Project manager Yang Xuan, Head of implementation China	The project is to install four waste heat recovery boilers to recover waste heat generated from the existing glass production lines of the company and convert waste heat into mechanical energy, which drives two sets of turbine-generator units with rated power of 6MW each for electricity generation. Hebei Yingxin Glass Group Co. Ltd. is the owner of both glass industrial facility and the project. All generated electricity will be consumed by the glass production itself, and no energy will be exported for sell. The details of the boiler, turbine and generator with respect to their number, type and model of the machines have been also introduced by the staff of the project during interview, and confirmed to be as per the GS-PDD.
Commissioning date of the project activity		The project completed construction and started trail operation on 12 August 2009.
Power plant operation and maintenance during this monitoring period		As per the interview, the power plant has been operated smoothly during this monitoring period (1 January 2012 to 31 March 2014). There is no equipment overhauled, retrofit/modification of the power plant in this monitoring period. However, the glass plant experienced overhauled for 7 and 8 months respectively in 2012, which resulted in the reduction of the wasted heat supply to the power plant and then the electricity generation accordingly. The power plant was under full load operation and no overhauled and large-scale downtime occurred in 2013,
Management and operational system, i.e. organizational structure, responsibilities		As introduced by the project owner, they are responsible for operation and routine maintenance of power plant. The quality assurance and quality control procedures have been addressed in the GS project management and monitoring manual. Also, monitoring organization has been established referring to GS-PDD, i.e. the daily monitored data by shift staff have been checked first by the team leader and then by the power plant manager. The monthly summary reports have been also checked by the plant manager. The monitoring management system is implemented following the GS project management and monitoring manual.
Electricity monitoring and recording procedures		The electricity meters have been read by both the glass plant (for M081, M091) and the power generation plant (for M040, M050, M041, M051 and M045) separately. The power generation plant

		obtains the meter readings of M081 and M091 from the glass plant side over the phone. The power generation plant manager is responsible for confirming the daily monitored data and monthly monitoring report.
Gap between the electricity measured by main meters (M091 and M081) and backup meters (M041 and M051)		Based on the discussion with the project owner during on-site interview, it was clarified that the main meters M091 and M081 are located at glass plant side, and the backup meters M041 and M051 are located at power plant side. Thus, there is line loss between main meters and backup meters. There are four lines between generation side (M041 and M051) and recipient side (M081 and M091), two parallel lines connected M051 and M091 (line M051-M091), and two parallel lines connected M041 and M081 (line M041-M081). And the actual line loss is below the theoretical values. Please refer to CL 1 and the ERs spreadsheet for details.
Calibration of electricity meters		According to GS-PDD the calibration frequency of all meters is once a year. However, the monitoring meters have been most recently calibrated respectively on 16 October 2011 (for M091, M081, M050, M040, M051 and M041) and on 13 September 2011 (for M045), with their calibrations valid for 5 years. The calibrations are all in accordance with the requirements of "Verification Regulation of Electrical Energy Meters with Electronics" (JJG596-1999), and cover the whole monitoring period of the project activity (from 1 January 2012 to 31 March 2014) A conservative approach was discussed during the on-site interview and has been adopted in the calculation of emission reductions for the project activity. Please refer to CL 3.
Training for employees		Series of training provided to all employees annually regarding safety and operation, fire protection, monitoring, etc.
SD indicators monitoring, and records		As clarified by the staff, all SD indicators are monitored in accordance with the Passport, which is conducted by the third qualified party or internal check, the monitoring results and frequency are in line with the local regulation and the Passport. It was confirmed by CTI by checking monitoring certificates and related records during on-site visit.
HR and employment of female		As per the staff interviewed during on-site visit, there are totally 24 employees in the plant, including 3 females. All employees are well trained and qualified, and they were satisfied with their salary. The female staffs are not engaged in dangerous and strenuous work, and are employed under the same salary condition and training courses as the male

		staff.
Working environment satisfaction of the employee		As introduced by the staff during on-site visit, they are well protected in their workplace, and satisfied with the working environment. For example: Noise: The mitigation measures are implemented i.e. noise reduction equipment and personal protective equipment. The noise is monitored every year and results are below the allowable limit of the national standard. Air quality during operation period / in workplace/ of whole glass plant area after the PA: The plant site is far away from the office area and neighboring residential area. The air quality is monitored every year, and results are below the allowable limit of the national standard. Water quality: The waste water i.e. circulating cooling water, boiler blow down water and municipal wastewater are well treated by the wastewater treatment system as design. The sewage from the plant has been discharged to the municipal sewage system after the lagoon treatment in the plant site, The water quality is monitored every year, and results are below the allowable limit of the national standard. Fire protection: The fire protection system is in place in the boiler rooms and the power generation room. The certificate of qualification of the plant's fire protection system has been issued by local safety bureau. Safe and healthy work environment for workers of the whole plant: Every staff participate the training of the employees regarding safety and operation every year. And the plant has achieved the certificate of conformance of the safe and healthy working environment Furnace waste refractory brick disposal: A contract has been signed with brick supplier for recycling use. The brick disposal is recorded on daily basis. During this monitoring period (1 January 2012 to 31 March 2014), there were no furnace waste refractory brick occurred.
The reason for the change of		The local environmental protection monitoring station has followed the national standard of

the national standards for noise, i.e. it was referred to GB12348-1990 in GS-PDD, while it was GB12348-2008 in the MR.		GB12348-1990, which was a national standard and widely used in the industry. This standard was replaced with GB12348-2008 since October 2008. So in MR the standard GB12348-2008 is referred.

APPENDIX D

CERTIFICATE OF COMPETENCE

CERTIFICATE OF APPOINTMENT

Mr. Lin Wu
Born on 25/09/1977

Satisfies the requirements of the Certification Body of CTI and is hereby appointed as:

Qualification as						
Status	GHG Auditor	Validator	Verifier	Team Leader	Technical Reviewer	Technical Expert
Date	20/01/2013	20/01/2013	20/01/2013	20/01/2013	20/01/2013	20/01/2013

Qualification in the scope and technical area		
Scope	Technical area	Date
SS 1: Energy industries (renewable/non-renewable sources)	TA 1.1: Thermal energy generation from fossil fuels and biomass including thermal electricity from solar	20/01/2013
	TA 1.2: Energy generation from renewable energy sources	20/01/2013
SS 2: Energy distribution	TA 2.1: Electricity distribution	20/01/2013
SS 3: Energy demand	TA 3.1: Energy demand	20/01/2013
SS 4: Manufacturing industries	TA 4.1: Cement sector	20/01/2013
SS 13: Waste handling and disposal	TA 13.1: Waste handling and disposal	20/01/2013
	TA 13.2: Animal waste management	20/01/2013

This appointment is valid for 3 years from its date of approval below and is bound by internal requirements of management system of the Certification Body of CTI.

Approved by:
WU Ze
Technical competent manager
Shenzhen, 20/01/2013

CERTIFICATE OF APPOINTMENT

Ms. Lin Shunrong
Born on 19/11/1977

Satisfies the requirements of the Certification Body of CTI and is hereby appointed as:

Qualification as						
Status	GHG Auditor	Validator	Verifier	Team Leader	Technical Reviewer	Technical Expert
Date	01/03/2013	01/03/2013	01/03/2013	01/07/2013	01/12/2013	01/03/2013

Qualification in the scope and technical area		
Scope	Technical area	Date
SS 1: Energy industries (renewable/non-renewable sources)	TA 1.2: Energy generation from renewable energy sources	01/03/2013

This appointment is valid for 3 years from its date of approval below and is bound by internal requirements of management system of the Certification Body of CTI.

Approved by:
Lin Wu
Technical competent manager
Shenzhen, 01/12/2013

CERTIFICATE OF APPOINTMENT

Mr. Zhou Lu
Born on 25/05/1973

Satisfies the requirements of the Certification Body of CTI and is hereby appointed as:

Qualification as						
Status	GHG Auditor	Validator	Verifier	Team Leader	Technical Reviewer	Technical Expert
Date	01/08/2012	01/08/2012	01/08/2012	01/08/2012	01/08/2012	01/08/2012

Qualification in the scope and technical area		
Scope	Technical area	Date
SS 1: Energy industries (renewable/nonrenewable sources)	TA 1.2: Energy generation from renewable energy sources	01/08/2012
SS 2: Energy distribution	TA 2.1: Electricity distribution	01/08/2012
	TA2.2: Heat distribution	01/08/2012
SS 3: Energy demand	TA 3.1: Energy demand	01/08/2012
SS 4: Manufacturing industries	TA 4.1: Cement sector	01/08/2012
SS 13: Waste handling and disposal	TA 13.1: Waste handling and disposal	01/08/2012

This appointment is valid for 3 years from its date of approval below and is bound by internal requirements of management system of the Certification Body of CTI.

Approved by:
Rowena JIAO
Technical competent manager
Shenzhen, 01/08/2012

CERTIFICATE OF APPOINTMENT

Mr. Zhang Lei
Born on 03/12/1981

Satisfies the requirements of the Certification Body of CTI and is hereby appointed as:

Qualification as						
Status	GHG Auditor	Validator	Verifier	Team Leader	Technical Reviewer	Technical Expert
Date	05/05/2013	05/05/2013	05/05/2013	05/05/2013	05/05/2013	05/05/2013

Qualification in the scope and technical area		
Scope	Technical area	Date
SS 1: Energy industries (renewable/nonrenewable sources)	TA 1.1: Thermal energy generation from fossil fuels and biomass including thermal electricity from solar	01/03/2014
	TA 1.2: Energy generation from renewable energy sources	05/05/2013
SS 4: Manufacturing industries	TA 4.1: Cement TA 4.3: Iron and steel TA 4.4: Refinery	05/05/2013
SS 13: Waste handling and disposal	TA 13.1: Waste handling and disposal	05/05/2013
	TA 13.2: Animal waste management	05/05/2013

This appointment is valid for 3 years from its date of approval below and is bound by internal requirements of management system of the Certification Body of CTI.

Approved by:
Lin Wu
Technical competent manager
Shenzhen, 01/03/2014

CERTIFICATE OF APPOINTMENT

Mr. Wang Haichao
Born on 07/12/1963

Satisfies the requirements of the Certification Body of CTI and is hereby appointed as:

Qualification as						
Status	GHG Auditor	Validator	Verifier	Team Leader	Technical Reviewer	Technical Expert
Date	-	-	-	-	-	01/08/2012

Qualification in the scope and technical area		
Scope	Technical area	Date
SS 4: Manufacturing industries	TA 4.1: Cement	01/08/2012
	TA 4.2: Aluminium	01/08/2012
	TA 4.3: Iron and steel	01/08/2012
	TA 4.5: Others	01/08/2012
SS 9: Metal production	TA 9.1: Metal production	01/08/2012

This appointment is valid for 3 years from its date of approval below and is bound by internal requirements of management system of the Certification Body of CTI.

Approved by:
Rowena JIAO
Technical competent manager
Shenzhen, 01/08/2012

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