Verification and certification report form for GS project activities	
BASIC INFORMATION	
Title of the project activity	Hebei Yingxin Glass Group Co. Ltd. Glass Furnace Flue Gas Waste Heat to Energy Project
GS Reference number of the project activity	GS750
Scale of the project activity	☒ Large-scale ☐ Small-scale
Version number of the verification and certification report	03
Completion date of the verification and certification report	04/06/2020
Monitoring period number and duration of this monitoring period	5th Monitoring period Duration:01/06/2018 to 31/12/2019
Version number of the monitoring report to which this report applies	Version 02
Crediting period of the project activity corresponding to this monitoring period	Fixed crediting period The fixed 10-year crediting period is from 01/01/2010 to 31/12/2019.
Project participants	Hebei Yingxin Glass Group Co. Ltd.; Swiss Carbon Assets Ltd.;
Host Party	P.R.China
Sectoral scope(s), selected methodology(ies)	Sectoral scope:01 ACM0012 Consolidated baseline methodology for GHG emission reductions from waste energy recovery projects, verison 3.2
Estimated amount of annual average certified SDG impact (as per approved PDD)	**SDG7**-76,000 MWh/yr **SDG8**-100% of the employees have access to training, health care, insurances and better income **SDG13**-67,906tCO_2e/yr
Total amount of certified SDG impact (as per approved methodology) achieved in this monitoring period	**SDG7**-109885.090MWh **SDG8**-24 persons **SDG13**-98,181 tCO_2e
Name of the DOE	China Classification Society Certification Company (CCSC)
Name, position and signature of the approver of the verification and certification report	**Mr. HUANG Shiyuan, General Manager**

SECTION A. Executive summary

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Swiss Carbon Assets Ltd. has commissioned China Classification Society Certification Company (hereafter referred to as "CCSC") to carry out the 5th periodic verification of Hebei Yingxin Glass Group Co. Ltd. Glass Furnace Flue Gas Waste Heat to Energy Project (hereafter referred to as "the Project", GS750) covering the monitoring period from 01/06/2018 to 31/12/2019.

A.1. Objective

The project verification is the periodic independent review and ex-post determination by a DOE of the monitored reductions in GHG emissions during defined verification period. In carrying out its verification work, the DOE shall ensure that the project activity complies with the GS4GG Principles and Requirements (version 1.1). The verification shall:

- Ensure that the project activity has been implemented and operated as per the registered PDD, the approved transition documentation and that all physical features (technology, project equipment, and monitoring and metering equipment) of the Project are in place;
- Ensure that the monitoring report and other supporting documents provided are complete in accordance with latest applicable version of the completeness checklist for requests for issuance of GS VERs and verifiable and in accordance with applicable CDM requirements and GS requirements;
- Ensure that actual monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plan, and the approved methodology including applicable tool(s);
- Evaluate the data recorded and stored as per the monitoring methodology including applicable tool(s).

A.2. Scope

The verification scope covers the relevant documents (e.g. the registered PDD version 2.0, the monitoring plan, the approved transition documentation, the monitoring report, the emission reduction calculation spreadsheet, supporting documents available to the verifier and information collected through performing interviews and during the on-site assessment, GS's tools and guidelines publicly available, relevant rules, including the host country legislation, etc.) to be independently reviewed, the Project geographical locations to be visited on-site, the Project local stakeholders to be interviewed with, and processes that are necessary to acquire objective evidence for the evaluation of the Project compliance to CDM and GS requirements.

The above verification activities are conducted according to the CDM and GS requirements. In doing so, the principles of accuracy and completeness, relevance, reliability and credibility were followed.

The verification is not meant to provide any consulting service towards the PPs. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the Project.

A.3. GS Project Description

The Project is constructed and operated by Hebei Yingxin Glass Group Co. Ltd./14//25/. The Project is located in Donghuan Road, Shahe City (county-level city), Xingtai City, Hebei Province, China. The geo coordinates of the Project:36˚51'18" N, 114˚30'11" E.

The installed capacity of the Project is 12MW, consisting of two 6 MW units. The waste heat of the Project is generated by four existing glass production lines. The waste heat is fed through waste heat pipes to four waste heat recovery boilers, which allow the feed water to recover the heat energy of low-temperature waste heat and convert it into superheated steam. Then steam is fed into the steam turbine through the steam pipe. The heat energy is converted into kinetic energy in the steam turbine to enable the turbine rotor to rotate at high speed, and then is converted into mechanical energy to drive the generator to rotate, and then electricity is generated.

The main purpose of the project is to recover and utilize waste heat from four existing glass production lines to generate electricity and meet part of the electricity demand of Hebei Yingxin Glass Group Co. Ltd., thereby displacing the electricity that is currently generated by the fossil-fuel dominated North China Power Grid (NCPG), consequently reducing the greenhouse gas (GHG) emissions.

The Project was registered as GS VER project on 30/09/2011. The annual expected electricity is 76,000 MWh, and the annual estimated emission reductions are 67,906 tCO_2e. The total emission reductions for the fixed crediting period of 10 years are estimated as 679,060 tCO_2e. The implementation of the project is found to be in accordance with the registered PDD.

This is the 5th monitoring period of the Project. During this monitoring period from 01/06/2018 to 31/12/2019, the total emission reduction during this monitoring period is 98,181tCO_2e.

A.4. GS Project verification process and conclusion

The verification is based on the currently valid documentation of the GS Foundation and the United Nations Framework Convention on Climate Change (UNFCCC).

The verification process includes three phases: 1) desk review of documents; 2) on-site inspection and follow-up interviews with the relevant personnel; 3) resolution of outstanding issues and the issuance of final verification report and opinion.

Two Corrective Action Requests (CARs) were raised in the verification process and successfully closed upon the project participant taken actions and submitted the revised monitoring report and supporting evidence. No Clarification Requests (CLs) and Forward Action Requests (FARs) were raised for this monitoring period.

In summary, CCSC confirms that the project is implemented as planned and described in the validated and registered project design documents. The registered monitoring plan is in accordance with the applied methodology and the monitoring system is in place and functional. The installed equipment for measuring parameters required for calculating emission reductions are calibrated appropriately. The Project is generating GHG emission reductions. The GHG emission reductions are calculated without material misstatements.

Based on the verified amount of emission reductions stated in the verification report, CCSC confirms the following statement, and requests the Gold Standard to issue the VERs:

GHG emission reduction for Vintage of 01/06/2018 to 31/12/2018	34,195 tCO_2e
GHG emission reduction for Vintage of 01/01/2019 to 31/12/2019	63,986 tCO_2e
Total amount of GHG emission reductions or net GHG removals by sinks achieved in this monitoring period (01/06/2018 to 31/12/2019)	98,181 tCO_2e

SECTION B. Verification team, technical reviewer and approver

B.1. Verification team member

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection	Interviews	Verification findings
1.	Team Leader	IR	LI	Xingtong	CCSC central office	√	√	√	√
2.	Team Member	IR	LI	Yong	CCSC central office	√	√	√	√
3.	Team Member	EI	ZHANG	Rui	CCSC central office	√		√	√

B.2. Technical reviewer and approver of the verification and certification report

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer	IR	YONG	Hanlin	CCSC central office
2.	Technical reviewer	IR	ZHENG	Ying	CCSC central office
3.	Approver	IR	HUANG	Shiyuan	CCSC central office

SECTION C. Application of materiality

All the data and information has been checked during verification; thus, the concept of materiality has not applied in this verification.

C.1. Consideration of materiality in planning the verification

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
1.	N/A	N/A	N/A	N/A

C.2. Consideration of materiality in conducting the verification

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N/A

SECTION D. Means of verification

D.1. Desk/document review

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A desk review of the MR (Version 01, dated 09/04/2020) /6/, and supporting documents was conducted by the verification team. The aim of the desk review of the documentation was to verify the completeness of the data and the information presented, to carry out the compliance check of the MR with respect to the monitoring plan and the applied methodology. Particular attention was given to the frequency of measurements, the quality of the metering equipment including calibration requirements, and the quality assurance and quality control procedures. The 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 was also conducted.

In addition to the monitoring documentation provided by the project participants, the DOE reviews:

a) The registered GS-PDD, the approved transition documentation and the monitoring plan/1//19/;

b) The validation report/2;

c) Previous monitoring reports and verification reports /4//5/;

d) The applied monitoring methodology /44//47/;

e) Relevant decisions, clarifications and guidance from the CMP and the CDM Executive Board and Gold Standard /41//42//43//44//46//47/;

f) Other information and references relevant to the project activity's resulting emission reductions (e.g. IPCC reports, laboratory analysis or national regulations)/32//33//34//35//36//37//38//39//40//41/

Appendix 3 to this report contains a complete list of all documents and proofs reviewed by the verification team.

D.2. On-site inspection

Duration of on-site inspection: 14/05/2020-15/05/2020				
No.	**Activity performed on-site**	**Site location**	**Date**	**Team member**
1.	**Opening meeting**: • Scope of work; • Timetable; • CARs/CLs; • Verification process; • GS procedure for verification, verification methodology, confidentiality	The project owner office	14/05/2020	Mr. LI Xingtong Mr. LI Yong
2	**Project site visit**: • Four waste heat recovery boilers, two sets of turbine-generator units. • Monitoring device and installed position: - Electricity meters (bi-directional meters)	Project site	14/05/2020	
3	**Interview:** • Project employees; • Local representatives and relevant local stakeholders	Project site	14/05/2020	
4	**Document Review:** • Verification of data collection and handling Procedures (including verify the monitored indicators and parameters): -Data collection (i.e. meter reading procedure), Data management (data records) and data corroboration (cross check reference and data archiving systems); -Use of external data and conservativeness; -ER calculations and application of methodology; -Documents need to be verified are listed in but not limited to Annex 3. • Verification of SDGs data collection and handling procedures: -Data type and data monitoring method (measured, calculated or estimated), Data Management and data corroboration; -Use of external data and conservativeness.	The project owner office	15/05/2020	
5	**Closing Meeting:** • CARs/CLs discussion, findings compilation, agreement on the time frame for replies; • Recommendations, impacts of the findings and delayed response upon timings and next steps.	The project owner office	15/05/2020	

D.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	SHI	Zhiting	Director of Hebei Yingxin Glass Group Co. Ltd.	14/05/2020 - 15/05/2020	-- Project implementation status, any changes from the last verification, compliance of the project implementation with the registered project design document -- The project on-site inspection (includingwaste heat recovery boilers and turbine-generators, monitoring devices) -- Parameters monitoring and processing activities -- Review of monitoring records of the net electricity supply and SDGs and calibration records of monitoring meters --Quality Management; organizational structure, responsibilities and competencies; Internal QA/QC Management procedures and document control --Compliance with National Laws and Regulations -- Environmental impact of the Project	Mr. LI Xingtong Mr. LI Yong
2.	YANG	Mining	Boiler worker of Hebei Yingxin Glass Group Co. Ltd.			
3.	LIU	Chao	Repairman of Hebei Yingxin Glass Group Co. Ltd.			
4.	ZHAO	Zihao	Steam turbine worker of Hebei Yingxin Glass Group Co. Ltd.			
5.	HU	Lixiang	Project Manager of Swiss Carbon Assets Ltd.		-- Preparation of Monitoring Report -- Compliance of the monitoring plan with the monitoring methodology --Compliance of monitoring with the monitoring plan -- Assessment of data and calculation of GHG emission reductions	
6.	ZHAO	Xiaoxia	Local residents		-- Environmental impact of the Project	
7.	LI	Lei				

Outcome of the interview with the stakeholders:

Date: 14/05/2020-15/05/2020	
The main topics in the interview are summarized as follows:	
Q1: Please take a brief introduction of the operation status of the project.	Response: 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

Date: 14/05/2020-15/05/2020	
The main topics in the interview are summarized as follows:	
	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 is consumed by the glass production itself, and no energy is exported for sale. The project completed construction and started trail operation on 12 August 2009. The power plant operated smoothly during this monitoring period (01/06/2018 to 31/12/2019). There was no equipment overhauled, retrofit/modification of the power plant in this monitoring period. So, we support this project.
Q2: Please describe the monitoring system and data acquisition and process procedure of the Project.	Response: We have established the appropriate monitoring system for the project as per the registered GS monitored plan, including independent monitoring team, quality assurance and quality control, data management and etc. All relevant parameters listed in the registered monitoring plan have been properly monitored, and the results and data have been recorded and well documented. The electricity meters have been read by both the glass plant i.e. M081, M091 and the power generation plant i.e. M040, M050, M041, M051 and M045 separately. The power generation plant obtains the meter readings of M081 and M091 from the glass plant side by phone. The power generation plant manager is responsible for confirming the daily monitored data and monthly monitoring report. All these recorded data has been available now for the verification purpose.
Q3: What the impacts (positive and negative) of the Project? eg. 1) Air quality during operating period 2) Quality of employment 3) Human and institutional capacity 4) Quantitative employment and income generation 5) Noise 6) Water quality 7) Furnace waste refractory brick disposal	Response: Sustainable Development Goals (SDGs) impacts of the Project are assessed by an independent third party. The impact of the Project is positive. 1) Air quality during operation period in workplace of whole glass plant area after the project activity is monitored every year, and results are below the allowable limit of the national standard and the plant site is far away from the office area and neighboring residential area. 2) The total 24 employees who are qualified with work obtain the permanent job positions. The projects' employees are trained every year to ensure the safety of workers and the normal operation at the site. 3) The total 24 employees are employed in the plant, including 3 females. All employees are well trained and qualified. 4) The projects' employees are paid monthly and they were satisfied with their salary. 5) 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. 6) The sewage from the plant has been discharged to the municipal sewage system after the lagoon treatment at the plant site. The water quality is

Date: 14/05/2020-15/05/2020	
The main topics in the interview are summarized as follows:	
	monitored every year, and results are below the allowable limit of the national standard. 7) The brick disposal is recorded on daily basis. During this monitoring period, there was no furnace waste refractory brick occurred.
Q4: Do you support the Project, and any other comments on the Project?	Response: Yes, we fully support the project, during the last few years we never heard any complaints about the project.

D.4. Sampling approach

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N/A

D.5. Clarification requests (CLs), corrective action requests (CARs) and forward action requests (FARs) raised

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
Compliance of the monitoring report with the monitoring report form	N/A	N/A	N/A
Compliance of the project implementation and operation with the registered PDD	N/A	N/A	N/A
Post-registration changes	N/A	N/A	N/A
Compliance of the registered monitoring plan with the methodologies including applicable tools and standardized baselines	N/A	N/A	N/A
Compliance of monitoring activities with the registered monitoring plan	N/A	2	N/A
Compliance with the calibration frequency requirements for measuring instruments	N/A	N/A	N/A
Assessment of data and calculation of emission reductions or net removals	N/A	N/A	N/A
Assessment of reported sustainable development co-benefits	N/A	N/A	N/A
Global stakeholder consultation	N/A	N/A	N/A
Others (please specify)	N/A	N/A	N/A
Total	**0**	**2**	0

SECTION E. Verification findings

E.1. Compliance of the monitoring report with the monitoring report form

Means of verification	Through cross-check and comparison, to confirm the applied monitoring report form is valid and listed in GS website.
Findings	• The MR /6//7/used the monitoring form available at GS website. • The MR /6//7/ is complete and meet all requirements of Instructions for filling out the GS4GG monitoring report form (version 01, June 2017) /46/. No CARs/CLs/FARs raised in this section.
Conclusion	According to Para. 352-353 of VVS-PA Version 02.0 /41/ and GS4GG /47/, CCSC verification team confirms that the monitoring report was compliance with relevant monitoring report form and instructions therein.

E.2. Remaining forward action requests from validation and/or previous verifications

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This is the 5th periodic verification and there are no remaining forward action requests from previous verifications, validation and GS review.

E.3. Compliance of the project implementation and operation with the registered project design document

<table>
<tr><td>Means of verification</td><td>The verification team has performed an on-site inspection to assess:

a) All physical features (technology, project equipment, and monitoring and metering equipment) of the registered GS project activity are in place.

b) The PP have operated the GS project activity as per the registered PDD version 2.0.

The verification team has:

• Applied the GPS instruments to check the project location and geo-coordinates;
• Checked the nameplates /29/ provided by the PP to confirm that the project equipment installation is consistent with the registered PDD.
• Through desk review checked the electricity meters and diagram of power connection system /26/ to confirm monitoring and metering equipment are in place.
• Reviewed the daily operation records /15/ to confirm the project has been operated as per the registered PDD.</td></tr>
<tr><td>Findings</td><td>As per the registered PDD of the project, it stated fixed crediting period was selected and the starting date of the crediting period is 1 January 2010. The project activity was registered as GS project on 30 September 2011. As stated in the previous four verification reports /5/ and by checking daily operation and records /15/ during on-site visit, CCSC 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 5th monitoring period (from 01/06/2018 to 31/12/2019) 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 by checking the nameplates /29/ or the equipment. CCSC 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, and confirmed to be as per the registered GS-PDD /1/.

The main technical parameters are verified by the verification team as below.

<table>
<tr><th>Equipment</th><th>Technical Information</th></tr>
<tr><td>Generator 1</td><td>Type: QF-J6-2
Rated Power: 6 MW
Rated speed: 3000 r/min
Manufacturer: Hangzhou Electrical Equipment Works
Serial number: 2008-111-2</td></tr>
<tr><td>Generator 2</td><td>Type: QF-J6-2
Rated Power: 6 MW
Rated speed: 3000 r/min
Manufacturer: Hangzhou Electrical Equipment Works
Serial number: 2008-111-1</td></tr>
<tr><td>Turbine 1</td><td>Type: N6-2.35
Capacity: 6 MW
Rated speed: 3000 r/min
Manufacturer: Hangzhou Chinen Steam Turbine Power Co., Ltd
Serial number: HS4513</td></tr>
<tr><td>Turbine 2</td><td>Type: N6-2.35
Capacity: 6 MW
Rated speed: 3000 r/min
Manufacturer: Hangzhou Chinen Steam Turbine Power Co., Ltd
Serial number: HS4503</td></tr>
</table></td></tr>
</table>

	<table><tr><td>Waste Gas Recovery Boiler 1</td><td>Type: QCF 110/500-15-2.5/420 Capacity: 16 t/h Manufacturer: Hangzhou Boiler Company Serial number: 6988001</td></tr><tr><td>Waste Gas Recovery Boiler 2</td><td>Type: QCF 110/500-18-2.5/420 Capacity: 17 t/h Manufacturer: Hangzhou Boiler Company Serial number: 66987001</td></tr><tr><td>Waste Gas Recovery Boiler 3</td><td>Type: QCF 110/500-18-2.5/420 Capacity: 16 t/h Manufacturer: Hangzhou Boiler Company Serial number: 66987002</td></tr><tr><td>Waste Gas Recovery Boiler 4</td><td>Type: QCF 110/500-15-2.5/420 Capacity: 11 t/h Manufacturer: Hangzhou Boiler Company Serial number: 66986002</td></tr></table> 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 records /15/, there was no equipment overhauled in this monitoring period. No retrofit/modification was found for the project activity by checking the plant daily operation records /15/ and interviewing with the manager and operator. CCSC 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. As part of the site visit, CCSC 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 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 /1/. No CARs/CLs/FARs raised in this section.
Conclusion	According to Para. 356 of VVS-PA Version 02.0 /41/, CCSC verification team confirms that: • The implementation status and equipment installation of the GS project activity are consistent with the registered PDD /1/; • The actual operation of the GS project activity is as per the registered PDD /1/ by the PP; • Information (data and variables) provided in the monitoring report is in accordance with that stated in the registered PDD /1/.

E.4. Post-registration changes

E.4.1. Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents

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N/A

E.4.2. Corrections

>>
N/A

E.4.3. Changes to the start date of the crediting period

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N/A

E.4.4. Inclusion of a monitoring plan

>>
N/A

E.4.5. Permanent changes from registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines or other methodological regulatory documents

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N/A

E.4.6. Changes to the project design

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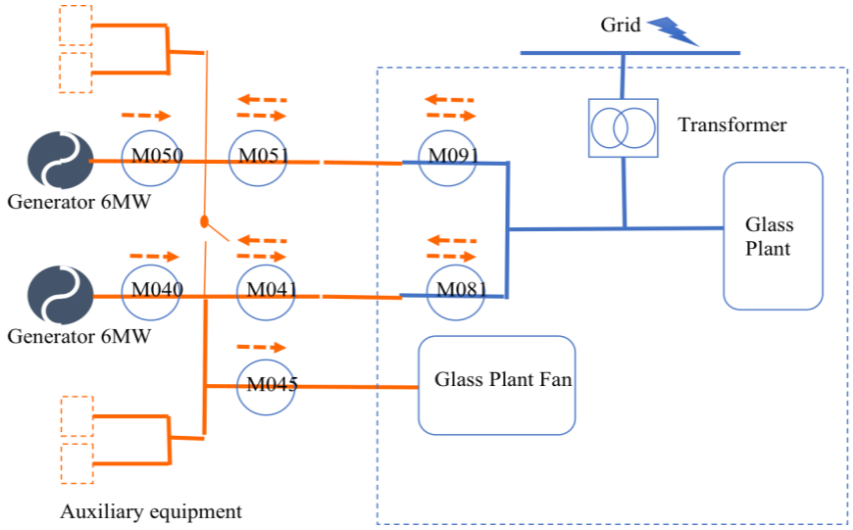
N/A

E.4.7. Changes specific to afforestation and reforestation project activities

>>
N/A

E.5. Compliance of the registered monitoring plan with applied methodologies, applied standardized baselines, and other applied methodological regulatory documents

Means of verification	The registered monitoring plan of the Project has been assessed against the monitoring methodology /44/ including applicable tools /41/.
Findings	The monitoring plan in the registered PDD and the approved transition documentation of the Project is in accordance with the approved methodology ACM0012 (version 3.2) including applicable tool(s) applied by the Project. And no monitoring aspects of the Project that are not specified in the methodology. Through the on-site observation and the interview with relevant staffs, the verification team confirmed the power connection system of the Project as below:  Directional meters M050 and M040 are used for monitoring total electricity generation ($Q_{OE,y}$). Directional meter M045, bidirectional meters M091 and M081 are used for net electricity export by the project activity (EG_y). Bidirectional meters M051 and M041, which are installed at generation side, are used to crosscheck M091 and M081.

	No CARs/CLs/FARs raised in this section.
Conclusion	CCSC verification team confirms that the monitoring plan in the registered PDD /1/ and the approved transition document /29/ is in accordance with the approved methodology and, where applicable, the applied standardized baseline, applied by the GS project activity, i.e. ACM0012 version 3.2 /44/. Therefore, the Project is also in compliance with the requirements of Para. 359 of VVS-PA Version 02.0 /41/ and GS4GG /46//47/.

E.6. Compliance of monitoring activities with the registered monitoring plan

E.6.1. Data and parameters fixed ex ante or at renewal of crediting period

Means of verification	As per the registered GS-PDD /1/ and the approved transition documentation of the Project /19/, three SDG relevant targets and indicators have been selected in accordance with the requirement of GS4GG: SDG 13: Take urgent action to combat climate change and its impacts SDG 8: Promote inclusive and sustainable economic growth, employment and decent work for all SDG 7: Ensure access to affordable, reliable, sustainable and modern energy for all For the calculations of baseline emissions, project emissions and leakage and emission reductions, the relevant SDG Indicator is under SDG 13. All reported data and parameters fixed ex-ante by the monitoring methodology ACM0012 version 3.2 and indicated in the registered GS-PDD and the approved transition documentation include as follow: **a) Combined Margin CO_2 Emissions Factor of the grid in year y ($EF_{grid,CM,y}$);** The data and parameters fixed ex-ante include $EF_{grid,CM,y}$, combined emission factor of the grid. The combined emission factor of the fixed crediting period of the Project has been determined ex-ante in the registered PDD (including this monitoring period). **b) Output energy (electricity) that can be theoretically produced ($Q_{OE, BL}$)** Output energy (electricity), $Q_{OE, BL,}$ that can be theoretically produced (in MWh) is 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 project activity ($Q_{OE, BL}$). The values of the parameters fixed ex-ante have been checked against with the monitoring plan in the registered PDD and the approved transition documentation of the Project by the verification team.
Findings	The calculations of baseline emissions, project emissions and leakage and emission reductions, the relevant SDG indicator under SDG 13 is Indicator: 13.B.1 Number of least developed countries and small island developing States that are receiving specialized support, and amount of support, including finance, technology and capacity-building, for mechanisms for raising capacities for effective climate change-related planning and management, including focusing on women, youth and local and marginalized communities. The data and parameters fixed ex-ante include as follow: **a) Combined Margin CO_2 Emissions Factor of the grid in year y ($EF_{grid,CM,y}$);** As per the description of the registered PDD and the approved transition documentation, the project is located in Shahe County of Xintai City, Hebei Province. The emission factor of North China Power Grid (NCPG) used in the monitoring report is 0.8935 tCO_2e/MWh, which has been verified against with the registered PDD and the approved transition documentation and found it to be consistent.

	b) Output energy (electricity) that can be theoretically produced ($Q_{OE, BL}$) As per the registered PDD and the approved transition documentation, the value of 86,400 MWh (the total electricity generation) for a year for $Q_{OE,BL}$ is applied in the calculation of f_{cap}, which has been verified against with the registered PDD and the approved transition documentation and found it to be consistent. **c) Fraction of total energy generated by the project activity using waste energy (f_{WCM})** As per the registered PDD and the approved transition documentation, this fraction is 100% if the energy generation is purely from use of waste energy in the project generation unit, the data applied is 100%, which has been verified against with the registered PDD and the approved transition documentation and found it to be consistent. No CARs/CLs/FARs raised in this section.
Conclusion	In conclusion, according to the requirement of 3.1.4 of GS4GG and Para. 363 and 364 of VVS-PA Version 02.0 /41/ and based on CCSC's local and sectorial knowledge, CCSC confirms that: The data and parameters fixed ex ante have been sufficiently monitored and correctly listed.

E.6.2. Data and parameters monitored

Means of verification	According to Para. 360 of VVS-PA Version 02.0 /41/ and GS4GG version 1.1, CCSC has performed the following activities to determine whether the monitoring of parameters related to the relevant SDG indicators such as under SDG13, SDG 8, SDG 7 have been implemented in accordance with the registered monitoring plan in the registered PDD and the approved transition documentation of the Project. (a) Through the on-site inspection of the monitoring system, interview with the operation staff, document review including relevant records, procedures and technical specifications, the verification team has assessed the implementation of the registered monitoring plan followed by the PP; (b) The parameters stated in the registered monitoring plan and relevant Board decisions has been checked by means above; (c) The verification team has checked the installation of the electricity meters by on-site inspection against the diagram of power connection system, the calibration reports by qualified third party were also inspected; (d) Monthly meter reading records /16//17/ containing both electricity export and import were checked by the team to confirm the frequency of the monitoring results; (e) Based on the interview with the top management, operation staff, the CCSC has assessed the quality assurance and quality control procedures applied by the PP; (f) The verification team has checked HR records /20/, training records /11/ and air/ water/ noise monitoring reports /18//21//23//24/ to confirm that the air/ water/ noise condition is monitored by the PP according to national standard. No sampling plan was involved in the GS project activity.
Findings	The methodology "ACM0012 Consolidated baseline methodology for GHG emission reductions from waste energy recovery projects (Version3.2)" /44/ and the tool "Tool to calculate the emission factor for an electricity system (version 02)"/45/ are applied to assess the SDG13 and SDG7. According to the registered monitoring plan in GS-PDD and transition documentation, the parameters which need to be monitored including: **1) Baseline emission parameters:** Baseline emissions (BE_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: **$BE_y = f_{cap} \times EG_y \times EF_{grid,CM,y}$** Where, **$BE_y$** :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. **$EF_{grid,CM,y}$** :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. The net electricity generation supplied by the project plant/unit to the glass plant (EG_y) is the electricity exported to the plant and glass plant fan ($EG_{export,y}$) minus the electricity import ($EG_{imported,y}$). The EG_y can be calculated as below: ***$EG_y = EG_{export,y} – EG_{imported,y}$*** Where, $EG_{export,y}$ Electricity exported by the project activity to the plant during year y in MWh. $EG_{imported,y}$ Electricity imported by the Project activity from the grid during year y in MWh. **$f_{cap} = Q_{OE,BL} / Q_{OE,y}$** 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. $Q_{OE,y}$:Quantity of actual output energy (electricity) during year y (MWh), which is be monitored ex-post . ***Relevant SDG Indictor: SDG Indicator 7.2.1: Renewable energy share in the total final energy consumption*** ***Data / Parameter No.1: Electricity exported by the project activity to the plant during year y in MWh ($EG_{export,y}$)*** The main bidirectional meters M091 and M081 which were installed at recipient side of glass plant and one glass plant fan line meter M045 are used for electricity exported by the project activity to the glass plant ($EG_{export,y}$); Two backup meters M051 and M041, which are installed at generation side, are used to crosscheck the electricity exported by main meters M091 and M081. Meter M045 is used for directly monitoring electricity export supplied to glass plant fan line. All the calibration records /9/ were reviewed by the verification team. 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. As a result, there is a calibration delay for M091, M081 and 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. During on-site visit, the verification team found that the calibration delay of all the meters and the conservative method adopted by the PP to assess the time gap of calibrations was not described in the monitoring report version 01. **CAR-1** was raised. By reviewing the monitoring report version 02, the verification team confirmed that the calibration delay of all the meters and the conservative method adopted by the PP to assess the time gap of calibrations was clearly described. **CAR-1** was closed. In the GS-PDD, it stated the accuracy of meters for monitoring electricity export will not less than 0.5. 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. It is conservative and reasonable. 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 are aggregated into monthly reports /17/. CCSC has verified these values to be consistent with the information used in the ER calculation spreadsheet /8/. The meter reading was usually recorded at the end day of each month jointly by the power plant and glass plant, which could be cross checked between main meter and back up meter. Hence CCSC verification team confirmed the indicator was satisfied. ***Relevant SDG Indictor: SDG Indicator 7.2.1: Renewable energy share in the total final energy consumption*** ***Data / Parameter* No.2*: Electricity imported by the project activity to the plant during year y in MWh ($EG_{imported,y}$)*** The main meters M091 and M081/9/, which were installed at recipient side of glass plant, are also used for electricity imported by the Project activity from the grid ($EG_{imported,y}$). As stated above, there is a calibration delay 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. It is conservative and reasonable. 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 are aggregated into monthly reports /16/. The meter reading was usually recorded at the end day of each month jointly by the power plant and glass plant. CCSC verification team has verified these values to be consistent with the information used in the ER spreadsheet /8/. Hence CCSC verification team confirmed the indicator was satisfied. ***SDG Indicator 7.2.1: Renewable energy share in the total final energy consumption &*** ***SDG Indicator 13.B.1: Number of least developed countries and small island developing States that are receiving specialized support, and amount of support, including finance, technology and capacity-building, for mechanisms for raising capacities for effective climate change-related planning and management, including focusing on women, youth and local***

and marginalized communities.

Data / Parameter* No.*3: Net electricity output by the project activity during year y in MWh (EG_y)

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.

According to the monitoring plan of the GS-PDD, the net electricity measured by main meters will be crosschecked with data measured at generation plant. According to interviewing the PP during on-site visit and review the previous verification reports/5/, CCSC 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 /9/.

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) /26/.

Based on monitoring data on daily basis and aggregated monthly, the actual line loss for line M051-M091 and line M041-M081 are respectively as follows:

Year	Theoretical Line Loss	Actual Line Loss	Theoretical Line Loss	Actual Line Loss
	M051 - M091	M051 - M091	M041 - M081	M041 - M081
01/06/2018-31/12/2018	0.61%	-0.69%	0.59%	-0.59%
01/01/2019-31/12/2019	0.65%	-0.55%	0.64%	-0.61%
Total	**0.64%**	**-0.60%**	**0.62%**	**-0.61%**

The calculation measure for theoretical line loss has been provided in the ERs spreadsheet /8/.

As verified the calculation of line loss the actual line loss is slightly lower than the theoretical values. CCSC considers that the line loss between generation side and recipient side is reasonable.

Hence CCSC verification team confirmed the indicators were satisfied.

SDG Indicator 7.2.1: Renewable energy share in the total final energy consumption &

SDG Indicator 13.B.1: Number of least developed countries and small island developing States that are receiving specialized support, and amount of support, including finance, technology and capacity-building, for mechanisms for raising capacities for effective climate change-related planning and management, including focusing on women, youth and local and marginalized communities.

Data / Parameter* No.*4: Quantity of total electricity generation during year y in MWh ($Q_{OE,y}$)

Two electricity meters M050 and M040 are used for monitoring total electricity generation by the Project ($Q_{OE,y}$).

In the GS-PDD, it stated the accuracy of meters for monitoring electricity generation will not less 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.

For meters M050 and M040, they are used to directly monitor electricity generation ($Q_{OE,y}$) for determining $f_{cap.}$ As described about the conservation method for the calibration delay above, 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 by the PP. Therefore, the accuracy 0.2S (0.2%) was for this monitoring period. It is conservative and reasonable. 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 /15/ are aggregated into monthly reports /16//17/. CCSC has verified these values to be consistent with the information used in the ER spreadsheet /8/. During on-site visit, the CCSC verification team found that the parameter Quantity of total electricity generation（$Q_{OE,y}$）was missing in the Monitoring Report version 01 /6/. **CAR-2** was raised. The PP revised the monitoring report and the CCSC verification team confirmed $Q_{OE,y}$ was added in the monitoring report version 02 dated 18/05/2020 /7/. **CAR-2** was closed. Therefore, as described above, all the meters have been installed in accordance with the registered PDD. The verification team has checked the location of the meters against the diagram of power connection system /28/ and found them to be consistent. The readings of the meters are continuously monitored and monthly recorded by the power plant and glass plant. The verification team has verified the values provided in the monitoring report version 02 /7/ and ER spreadsheet /8/ against the relevant documented evidences i.e. monthly meter reading records /19/ and found them to be consistent with the evidences. The meter readings can cover this monitoring period from 01/06/2018 to 31/12/2019. **2) Project emission parameters:** The project emissions are not accounted for as defined to be zero in the GS-PDD and the approved transition documentation /3/ as per ACM0012 version 3.2 /44/ CCSC verification team confirmed that no auxiliary fuels are used and gas cleaning for the proposed project activity by interviewing the PP. Hence the project emission is zero. $PE_y = 0$. **3) Leakage emission parameters:** Leakage emissions are deemed negligible and therefore considered to be zero according to ACM0012 version 3.2 /44/ **Management and operational system:** The PP has the responsibility of overall monitoring, which has established a monitoring team for monitoring of power generation, maintenance and operation of the GS Project activity. All data, including calibration records, will be kept until 2 years after the end of the total crediting period. Responsibilities have been allocated to the well-trained monitoring staff as per the Monitoring Plan. The QA / QC procedures are part of management system and are documented in management procedures. The records and all relevant paper-based information are collected and archived by technical department of the project owner and all the material will have a copy for backup. The internal training records /11/have been provided and verified by the verification team. CCSC verification team has verified the quality assurance and quality control procedures from the project /12//13/, and interviewed with the project implementation team. CCSC confirmed that the project team is able to conduct the management and monitoring well, and recorded values are reasonable and acceptable.

	According to the monitoring plan in approved transition documentation of the Project, **SGD 8** is measured as Indicator numbers 2(air quality during operating period),3 (Quality of employment),4(Human and institutional capacity),5(Quantitative employment and income generation),6(Noise),7(water quality), and 10 (Furnace waste refractory brick disposal) which are in accordance with the registered GS Passport version 2 dated 08/05/2011. The parameters need to be monitored including as follows: ***SDG Indicator 8.5.1 Average hourly earnings of female and male employees, by occupation, age and persons with disabilities.*** ***Data / Parameter* No.*5: Quality of employment (permanent job positions)*** The parameter is about the number of employment generated by the Project. The monitoring frequency is annually as per the registered monitoring plan. During on-site visit, CCSC verification team verified that the HR records of the power plant in 2018 and in 2019 /20/ were provided by the project owner, and the power plant employed 24 employees for operation of the project facilities in 2018 and 2019 separately. This was also verified by interviewing with the staff. CCSC verification team has confirmed the monitoring frequency is in accordance with the registered monitoring plan. Hence CCSC verification team confirmed the indicator was satisfied. ***SDG Indicator 8.5.1 Average hourly earnings of female and male employees, by occupation, age and persons with disabilities.*** ***Data / Parameter No.6: Human and institutional capacity (female employment, number, education)*** This project provides employment for qualified female and give trainings for them. During on-site visit, CCSC verification team confirmed with HR records in 2018 and 2019 /20/ that the power plant employed 2 female employees who were employed under the same salary conditions as male staff, which was also verified with the interview with the staff. Through reviewing the surveys on employee's satisfaction on environment and salary conducted by the PP in 2018 and 2019 /22/, the verification team confirmed that all the employees are satisfied with the working environment and salary. CCSC verification team also confirmed the training of the employees (both male and female) regarding safety and operation with their training records /11/. The monitoring frequency was annually in accordance with the registered monitoring plan. CCSC verification team confirmed the indicator was satisfied. ***SDG Indicator 8.5.1 Average hourly earnings of female and male employees, by occupation, age and persons with disabilities.*** ***Data / Parameter No.7: Quantitative employment and income generation (employee income)*** The project provides employment for qualified people. The project gives equal pay based on the same value of employees provided. During on-site visit, CCSC verification team confirmed with HR records in 2018 and 2019 /20/ that 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 satisfaction survey conducted in year 2018 and 2019 /22/. Further this was confirmed through the interview with the staff during the site visit. The monitoring frequency was annually in accordance with the registered monitoring plan. Hence CCSC verification team confirmed the indicator was satisfied. ***SDG Indicator 8.5.1 Average hourly earnings of female and male employees,***

	by occupation, age and persons with disabilities. ***Data / Parameter No.8: Air quality during operating period*** The project pays attention to the air quality and it is monitored by qualified third party. During on-site visit, CCSC verification team verified that the air quality during operation period was reported on 27/12/2017, 26/12/2018 and 23/12/2019 on the dust and SO_2 concentration at exhaust pipe in 2018 and 2019 /18/by Shahe Environmental Protection Monitoring Center, covering the period of this verification. CCSC verification team confirmed the monitoring frequency was annually in accordance with the monitoring plan. As indicated in Air quality analysis report in 2018 and 2019 /18/ the dust and SO_2 concentration at exhaust pipe were below the allowable limit of the national standard *Emission Standard of Air Pollutants for Flat Glass Industry (GB26453-2011)* /36/. The workplace air quality was measured on 29/11/2017, 20/11/2018 and 15/11/2019 /21/ by Shahe Environmental Protection Monitoring Center to monitor if the air indoor contains benzene, sulfur acid, and hydrogen fluoride and make sure the employees work safely and healthy. CCSC verification team confirmed no benzene, sulfur acid, and hydrogen fluoride was monitored in 2018 and 2019 and the workplace air quality follows national standard (GBZ1-2002) /38/. The monitoring frequency was annually in accordance with the registered monitoring plan. CCSC verification team also reviewed training records /11/, the certificate of conformance of the safe and healthy working environment issued on 10 August 2015 valid till 9 August 2018 and 10 August 2018 valid till 9 August 2021 /27//28/ and interviewed with employee, and confirmed the safe and healthy work environment for workers of the plant has been achieved. Hence CCSC verification team confirmed the indicator was satisfied. ***SDG Indicator 8.5.1 Average hourly earnings of female and male employees, by occupation, age and persons with disabilities.*** ***Data / Parameter No.9: Noise*** The project has installed noise reduction equipment and provide protection gears for employees. As stated in the monitoring plan, the mitigation measure is to install noise reduction equipment and protection measures for personnel. During on-site visit, CCSC confirmed that the turbines and generators were 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 were installed inside the boiler house, where usually no operators were stationed and their operating conditions were monitored remotely. CCSC verification team also confirmed verified that the noise during operation period was reported on 13/10/2017, 11/10/2018 and 29/09/2019 /23/ by Shahe Environmental Protection Monitoring Center, covering the period of this verification. For noise analysis, the Shahe Environmental Protection Monitoring Center applied the national standard GB12348-2008 /39/ which replaced GB12348-1990 since October 2008 and widely used in the industry. CCSC confirmed the monitoring frequency is in accordance with the monitoring. As indicated in Noise Analysis Report in 2017,2018 and 2019 /23/ the noise were below the allowable limit of the national standard 'Emission Standard for Industrial Enterprises Noise at Boundary (GB12348-2008)'/38/. ***SDG Indicator 8.5.1 Average hourly earnings of female and male employees, by occupation, age and persons with disabilities.*** ***Data / Parameter No.10: Water quality***

	The waste water generated by this project are treated by the project owner before they are discharged into municipal sewage system. The discharged water is complied with national discharge standard. During on-site visit, CCSC verification team also confirmed verified that the water quality during operation period was measured on 12/09/2017, 10/09/2018 and 05/09/2019 /24/ by Shahe Environmental Protection Monitoring Center, covering the period of this verification. CCSC confirmed the monitoring frequency is annually in accordance with the monitoring. As indicated in the water quality analysis report, the quality of discharged wastewater satisfied the national standard 'Emission Standard for Integrated wastewater dischage standard (GB8978-1996)'/39/. During on-site visit, CCSC checked the flow-diagram of the wastewater treatment plant 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 CCSC confirmed the indicator was satisfied. ***SDG Indicator 8.5.1 Average hourly earnings of female and male employees, by occupation, age and persons with disabilities.*** ***Data / Parameter No.11: Furnace waste refractory brick disposal*** This parameter is furnace waste refractory brick disposal with proper hazardous waste management measures The power plant operation and glass plant manufacturing were recorded daily basis. Hence, CCSC verification team confirmed the monitoring frequency was annually in accordance with the monitoring plan and covering this monitoring period. During on-site visit, CCSC verification team reviewed the power plant operation records /15/ and interviewed the staff, and confirmed there were no furnace waste refractory brick occurred during this monitoring period. Hence CCSC verification team confirmed the indicator was satisfied. The CCSC verification team confirms that the positive SDG Impacts and associated monitoring parameters of the Project have been reported in monitoring report version 02 which is in accordance with the requirements of GS4GG. [Continuous grievance mechanism] During the on-site inspection, the verification team found the Continuous Input / Grievance Expression Process Book was kept by the office manager and leader of the village. The telephone and email access to the project owner and GS expert were made available by the project owner on the project site which could enable the stakeholders to provide feedback on the project. The verification team confirmed that the PPs maintained a transparent communication channel with local stakeholders throughout the monitoring period and no comments have been made through the Continuous input & grievance mechanisms.
Conclusion	Corresponding to the paragraph 363 and 364 of VVS-PA Version 02.0 /41/ and GS4GG, CCSC verification team confirms that: • The monitoring has been carried out in accordance with the monitoring plan contained in the registered PDD/1/ and the approved transition documentation. • All parameters required by the monitoring plan have been sufficiently monitored and correctly listed. The monitored data for required parameters have been verified by checking the whole information flow.

E.6.3. Implementation of sampling plan

Means of verification	All the data and information has been checked during verification, thus no sampling plan has been applied in the project.
Findings	N/A
Conclusion	N/A

E.7. Compliance with the calibration frequency requirements for measuring instruments

Means of verification

The registered monitoring plan requires that the accuracy of monitoring metersfor electricity exported by the project activity to the plant ($EG_{export,y}$) and electricity imported by the project activity from the grid ($EG_{import,y}$) should be no worse than 0.5 and the accuracy of monitoring meters for Quantity of total electricity generation ($Q_{OE,y}$) should be no worse than1.0 , all the monitoring meters should be carried out calibration once every year according to the standard of Technical Administrative Code of Electric Energy Metering (DL/T 448 -2000) /34/.

The verification team has verified the calibration records and the accreditation certificates of the calibration entity against the registered monitoring plan and relevant national or local standards.

Findings

During this monitoring period, the installed measuring instruments have been operating well and were duly calibrated /9/.
As per the GS-PDD and the approved transition documentation, 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.

The calibration records of the meters described as following:

Meter Measuring	Tag No.	Meter Serial No.	Meter type and model	Specific location	Accuracy (%)	Calibration date (dd/mm/yy)	Valid until (dd/mm/yy)	Certificate No.
$Q_{OE,y}$	050	500006	DSSD331	Generator	0.2S	15/10/2016	14/10/2021	20161016012
$Q_{OE,y}$	040	500004	DSSD331	Generator	0.2S	15/10/2016	14/10/2021	20161016004
$EG_{export,y}$ $EG_{import,y}$	051	500001	DSSD331	Control room	0.2S	15/10/2016	14/10/2021	20161016014
$EG_{export,y}$ $EG_{import,y}$	041	500005	DSSD331	Control room	0.2S	15/10/2016	14/10/2021	20161016063
$EG_{export,y}$	045	550476	DSSD331	Control room	0.5	12/09/2016	11/09/2021	20161016021
$EG_{export,y}$ $EG_{import,y}$	081	006513	DSSD904	Glass furnace room	0.5S	15/10/2016	14/10/2021	20161016102
$EG_{export,y}$ $EG_{imported,y}$	091	006519	DSSD904	Glass furnace room	0.5S	15/10/2016	14/10/2021	20161016011

Calibration Entity: Shahe Power Supply Company

Note: Bureau of Technical Supervision of Xingtai City: Ceritificate of Metrological Authorization for Special Items of Shahe Power Supply Company issued on 02 Aug 2018 valid till 01 Aug 2022 /10/

[Instrument accuracy]

The verification team has verified the calibration records and the accreditation certificates of the calibration entity. All the meters meet the rated accuracy level as described in the monitoring plan of the registered PDD /18/ and approved transition documentation/19/.

[Calibration frequency]

	All the calibration records /9/ were reviewed by the CCSC verification team. 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 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 described in E6.2 of this verification report, since a conservative method to assess the time gap of calibrations was adopted by the PP and clearly reported in the revised monitoring report version 02. Therefore, the calibration frequency fulfills the requirement as described in the monitoring plan of the registered PDD and complied with the national standards /35/.
Conclusion	Corresponding to the paragraph 365 of VVS-PA Version 02.0, CCSC verification team confirms that: • The calibration is conducted at the frequency as specified by the methodology and the monitoring plan contained in the registered PDD and and approved transition documentation. • The calibration of the measuring equipment that has no impact on the claimed GHG emission reductions is conducted at the frequency specified in the applied methodologies and the registered monitoring plan.

E.8. Assessment of data and calculation of SDG outcomes

E.8.1. Calculation of baseline value or estimation of baseline situation of each SDG outcome

Means of verification	SDG 13&7-According to GS4GG and the Para.372 of VVS-PA Version 02.0, the verification team has performed the following activities to assess the data and calculations of GHG emission reductions achieved by the Project as per the methodology ACM0012 Consolidated baseline methodology for GHG emission reductions from waste energy recovery project version 3.2 /44/: (a) Through desk review and on-site inspection on the monitored data regarding electricity supply and electricity generation against monthly meter reading records, to verify that a complete set of data for the specified monitoring period is available. (b) Information provided in the monitoring report has been cross-checked with other sources such as daily operating logs; (c) Review the calculations of baseline GHG emissions have been carried out in accordance with the formulae and methods described in the registered monitoring plan /1/, and ACM0012 Consolidated baseline methodology for GHG emission reductions from waste energy recovery project verison 3.2 /44/; (d) Review emission factor of the grid ($EF_{grid,CM,y}$), IPCC default values, GWPs and other reference values as per the registered PDD and the approved transition documentation; SDG 8- According to GS4GG, review HR records, training records and air quality/noise/waste water monitoring reports from the third party to all relevant staff are have access to training, health care, insurances and are satisfied with their income, good working conditions.
Findings	A complete set of data for the specified monitoring period is available. The methodology “ACM0012 Consolidated baseline methodology for GHG emission reductions from waste energy recovery projects (Version3.2)” and the tool “Tool to calculate the emission factor for an electricity system (version 05.2)” are applied to assess the SDG13. The process and result are shown as below: **1) Baseline emission:** Baseline emissions (BE_y in tCO_2) are the product of the baseline emissions factor ($EF_{grid,CM,y}$ in tCO2/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:

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

Where,

BE_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.

$EF_{grid,CM,y}$: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.

The net electricity generation supplied by the project plant/unit to the glass plant (EG_y) is the electricity exported to the plant and and glass plant fan ($EG_{export,y}$) minus the electricity import ($EG_{imported,y}$).

The EG_y can be calculated as below:

$$EG_y = EG_{export,y} - EG_{imported,y}$$

Where,

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

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

As described above, the meters have been installed in accordance with the registered PDD. The verification team has checked on-site the location of the meters against the diagram of power connection system and found them to be consistent.

The readings of the meters are continuously monitored and usually recorded at the end day of each month jointly by the power plant and glass plant. The monthly meter reading records provided the PP cover the import electricity from the grid ($EG_{imported,y}$) and export to electricity the grid ($EG_{export,y}$) by the project during this monitoring period.

As described above, the calibration certificates for 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 01/01/2017 to 31/05/2018. 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 following tables provide the calculation of the baseline emissions during the monitoring period.

Period	Electricity export after discount of 0.5% ($EG_{export,y}$) (MWh)	Electricity import after increase of 0.5% ($EG_{imported,y}$) (MWh)	Net electricity output by the project ($EG_y=EG_{export,y}-EG_{imported,y}$) (MWh)
01/06/2018-30/06/2018	5770.000	3.160	5766.840
01/07/2018-31/07/2018	4669.730	3.960	4665.770
01/08/2018-31/08/2018	5095.120	4.370	5090.750
01/09/2018-30/09/2018	5557.460	3.960	5553.500
01/10/2018-31/10/2018	5640.380	4.260	5636.120
01/11/2018-30/11/2018	5474.990	3.160	5471.830

01/12/2018-31/12/2018	6090.640	4.160	6086.480
Total in 2018	**38298.320**	**27.030**	**38271.290**
01/01/2019-31/01/2019	5834.400	4.780	5829.620
01/02/2019-28/02/2019	6871.450	4.270	6867.180
01/03/2019-31/03/2019	6415.620	6.320	6409.300
01/04/2019-30/04/2019	6583.080	2.440	6580.640
01/05/2019-31/05/2019	5773.410	3.980	5769.430
01/06/2019-30/06/2019	5911.390	2.650	5908.740
01/07/2019-31/07/2019	6146.820	3.260	6143.560
01/08/2019-31/08/2019	5462.440	2.750	5459.690
01/09/2019-30/09/2019	5951.890	3.980	5947.910
01/10/2019-31/10/2019	5833.760	3.570	5830.190
01/11/2019-30/11/2019	5474.580	3.170	5471.410
01/12/2019-31/12/2019	5400.910	4.780	5396.130
Total in 2019	**71659.750**	**45.950**	**71613.800**
Total	**109958.07**	**72.980**	**109885.090**

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

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.

$Q_{OE,y}$:Quantity of actual output energy (electricity) during year y (MWh), which will be monitored ex-post /1//19/.

For year 2018 (01/06/2018 to 31/12/2018):

$Q_{OE, BL}/Q_{OE, 2018}$ = 50656.438[1]/41376.548>1, therefore f_{cap} for year 2018 = 1 according to ACM0012. The net electricity supplied to the glass plant is 38,271.29MWh in **2018** which result in the baseline emission reductions 34,195 tCO_2e.

For year 2019 (01/01/2019 to 31/12/2019):

$Q_{OE, BL}/Q_{OE, 2019}$ = 86,400/78336.539>1, therefore f_{cap} for year 2019 = 1 according to ACM0012. The net electricity supplied to the glass plant is 71,613.80MWh in 2019 which result in the baseline emission reductions 63,986 tCO_2e.

$EG_y=EG_{export,y}-EG_{imported,y}$＝109958.07MWh-72.980MWh＝109885.090MWh

Therefore, the baseline emissions (BE_y) are calculated as follows

$BE_y= EG_y \times EF_{grid,CM,y}$= 109885.090MWh×0.8935 tCO_2/MWh= 98,181 tCO_2e

$ER_y= BE_y- PE_y$ =98,181-0 = 98,181 tCO_2e.

The emission reductions of 2018 and 2019 split as follows:

Year 2018	01/06/2018-31/12/2018	34,195
Year 2019	01/01/2019-31/12/2019	63,986

Hence, 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 01/06/2018 to 31/12/2019 which have been verified by CCSC. Emission reduction calculations were presented in a worksheet /2/ and CCSC has assessed the calculations to be complete and transparent.

[Double Counting]

[1] For year 2018 (01/06/2018 to 31/12/2018):$Q_{OE, BL}$= 50,656.438MWh=86,400MWh*214/365days

	By reviewing The Letter of Confirmation on Avoiding Double Counting provided by the PP /30/, the verification team has confirmed that the GS Project has not claimed in the past or would not claim Green or White Certificates, Renewable Energy Credits (RECs) or any other equivalent certificates in future, and confirmed the project has not been registered as CDM project (http://cdm.unfccc.int) or CCER projects or under other voluntary carbon crediting scheme, and confirmed there is no doubt of double counting for the emission reductions during this monitoring period. SDG 8- According to the approved transition documentation of the Project, the baseline of SDG 8 is People in the project site mainly work on farming or go to other cities for employment. Most of them do not have proper trainings and good working conditions. Therefore, baseline vale of SDG 8 is no employment and no trainings as described in the Monitoring Report version 02. SDG 7-According to the approved transition documentation, without the project, the equivalent electricity would have been continually supplied from the NCPG to meet the demand for power of the glass plant, which did not contribute to the target of 7.a under SDG 7 "By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology". Therefore, the baseline value of SDG 7 =0 MWh as described in the Monitoring Report version 02. No CARs/CLs/FARs raised in this section.
Conclusion	Corresponding to the paragraph 374 of VVS-PA Version 02.0 and GS4GG, CCSC verification team confirms that: • A complete set of data for the monitoring period is available. • Information provided in the monitoring report has been cross-checked with other sources such as daily operating logs; • Calculations of baseline emissions, and project activity emissions and leakage, as appropriate, been carried out in accordance with the formulae and methods described in the monitoring plan and the applied methodology document. • There are no assumptions in emission calculations. • Appropriate emission factor, IPCC default values, GWPs and other reference values have been correctly applied.

E.8.2. Calculation of project value or estimation of project situation of each SDG outcome

Means of verification	According to the Para.372 of VVS-PA Version 02.0 and GS4GG, the verification team has reviewed the project emission calculation (SDG13), Indicator numbers 2(air quality during operating period),3(Quality of employment),4(Human and institutional capacity),5(Quantitative employment and income generation),6(Noise),7(water quality),and 10 (Furnace waste refractory brick disposal) (SDG8), net electricity production by the project activity (SDG7) as per the registered PDD /1/, approved transition documentation and the applied methodology /44/.
Findings	SDG 13-The project emissions are not accounted for as defined to be zero in the GS-PDD, therefore as per ACM0012 verison 3.2 the project emissions are zero. SDG 8-As per the assessment in E6.2 of this verification report, the verification team confirmed all relevant 24 staff employed by PP have access to training, health care, insurances and were satisfied with their income which was accordance with that in the registered PDD/4/ and the approved transition documentation. SDG7-According to the registered PDD/4/ and the approved transition documentation, the net electricity generation supplied by the project plant/unit to the glass plant (EG_y) is the electricity exported to the plant and glass plant fan

	($EG_{export,y}$) minus the electricity import ($EG_{imported,y}$). During this monitoring period (01/06/2018 to 31/12/2019): EG_y 109885.090 MWh $EG_{export,y}$ 109958.070 MWh $EG_{imported,y}$ 72.980 MWh The verification team confirmed all project values of SDG13, SDG8 and SDG7 have been correctly reported in MR version 02. No CARs/CLs/FARs raised in this section.
Conclusion	Corresponding to the paragraph 374 of VVS-PA Version 02.0 and GS4GG, CCSC verification team confirms that: • A complete set of data for the monitoring period is available. • Information on the project GHG emission calculation provided in the monitoring report has been cross-checked with other sources. • Calculations of project emissions have been carried out in accordance with the formulae and methods described in the monitoring plan and the applied methodology document. • There are no assumptions in emission calculations.

E.8.3. Calculation of leakage GHG emissions

Means of verification	According to the Para.372 of VVS-PA Version 02.0, the verification team has reviewed the leakage calculation as per the registered PDD /1/, approved transition documentation and the applied methodology /44/.
Findings	SDG 13-Leakage emissions are deemed negligible according to ACM0012 Consolidated baseline methodology for GHG emission reductions from waste energy recovery project verison 3.2.
Conclusion	Corresponding to the paragraph 374 of VVS-PA Version 02.0, CCSC verification team confirms that: • A complete set of data for the monitoring period is available. • Information on the leakage GHG emission calculation provided in the monitoring report has been cross-checked with other sources. • Calculations of leakage have been carried out in accordance with the formulae and methods described in the monitoring plan and the applied methodology document.

E.8.4. Summary calculation of net benefits as difference of baseline and project values or direct calculation for each SDG outcome

Means of verification	The verification team has reviewed the calculation of GHG emission reductions, permanent job positions created by the Project and the net electricity generation supplied by the project plant/unit to the glass plant in the GS-MR Version 02 /7/ and ER Calculation Sheet /8/ as per the registered PDD/1/ and the approved transition documentation, and the methodology /44/.
Findings	SDG 13-As elaborated above, the entire emission reductions of the Project during this monitoring period were based on baseline emissions and project emissions. The calculations in the final monitoring report (version 02) /7/ and corresponding ER spreadsheet /8/ were found appropriate and complying with the registered monitoring plan in the registered PDD, the approved transition documentation and applied methodology. The verification team confirms that the calculation is accurate and conservative. The total number of ERs achieved during this monitoring period from 01/06/2018 to 31/12/2019 is calculated as: $ER_y = BE_y - PE_y$ = **98,181** - 0 = **98,181** tCO_2e.

	SDG 8-Project value – Baseline value=24 persons (permanent job positions created by the Project) SDG 7-Project value – Baseline value=109885.090MWh No CARs/CLs/FARs raised in this section.
Conclusion	Corresponding to the paragraph 374 of VVS-PA Version 02.0, CCSC verification team confirms that: • A complete set of data for the monitoring period is available. • Information provided in the monitoring report has been cross-checked with other sources such as daily operation logs; • Calculations of baseline emissions, and project activity emissions and leakage, as appropriate, been carried out in accordance with the formulae and methods described in the monitoring plan and the applied methodology document. • There are no assumptions in emission calculations. • Appropriate emission factor, IPCC default values, GWPs and other reference values have been correctly applied.

E.8.5. Comparison of actual value of outcomes with estimates in approved PDD

Means of verification	The comparison of actual GHG emission reductions, permanent job positions created by the Project and the net electricity generation supplied by the project plant/unit to the glass plant with estimates in registered PDD has been checked and re-calculated by the verification team.
Findings	SDG 13-Based on the above assessment, the emission reduction during the monitoring period from from 01/06/2018 to 31/12/2019 is verified as 98,181 tCO_2e. Compared with the value of estimated emission reductions during the same period, in the registered PDD/4/ and the approved transition documentation, which is 107,719 tCO_2e=67,906*(579/365) tCO_2e. The verified emission reductions are 8.85% less than the estimated value in the monitoring period. SDG 8-Based on the above assessment, all relevant 24 staff are have access to training, health care, insurances and are satisfied with their income, which is same as the data in the registered PDD/4/ and the approved transition documentation. SDG 7-Based on the above assessment, the actual net electricity generation of the Project during the monitoring period from from 01/06/2018 to 31/12/2019 is verified as 109885.090 MWh. Compared with the value of estimated emission reductions during the same period, in the registered PDD/4/ and the approved transition documentation, which is 120,558.904 MWh=76,000*(579/365) MWh. The verified actual net electricity generation of the Project is 8.85% less than the estimated value in the monitoring period. No CARs/CLs/FARs raised in this section.
Conclusion	Corresponding to the paragraph 356 of PS-VVS Ver.02.0, CCSC can confirm that: A comparison of actual GHG emission reductions or net anthropogenic GHG removal, permanent job positions created by the Project, net electricity generation supplied by the project plant/unit to the glass plant of the GS project activity achieved during this monitoring period with the estimates in the registered PDD and approved transition documentation has been provided. The verification team considers the calculation of the comparison is correct.

E.8.6. Remarks on difference from estimated value in registered PDD

Means of verification	SDG 13-The verified emission reductions are 8.85% less than the estimated value in the monitoring period. Thus, no remarks need to be provided in the MR.

	SDG8 -No difference SDG 7-The verified actual net electricity generation of the project is 8.85% lower than expected value in this monitoring period.
Findings	N/A
Conclusion	Not applicable since the actual GHG emission reductions are lower than the estimates in the registered PDD and the approved transition documentation.

E.8.7. Actual GHG emission reductions or net anthropogenic GHG removals by sinks during the first commitment period and the period from 1 January 2013 onwards

Means of verification	As the current monitoring period is from 01/06/2018 to 31/12/2019, which the start date is after 31/12/2012. Thus, it is not applicable.
Findings	N/A
Conclusion	N/A

E.9. Assessment of reported sustainable development co-benefits

Means of verification	The CCSC verification team has checked against the GS-MR submitted by the project participants (PPs) and interviewed with PPs, and confirms that they have not monitored the sustainable development co-benefits of the registered GS project activity, and not requested the DOE to verify them. Therefore, the assessment of reported sustainable development co-benefits for the Project is not applicable.
Findings	N/A
Conclusion	N/A

E.10. Global stakeholder consultation

Means of verification	During the on-site inspection and the stakeholders' interview, the verification team did not receive any authentic and relevant comments from the local stakeholders. Therefore, the global stakeholder consultation is not applicable in this verification period.
Findings	N/A
Conclusion	N/A

SECTION F. Internal quality control

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CCSC has taken the following quality control measures within the verification team and of the verification process according to relevant CCSC's internal procedures:

- The application review of the verification was conducted and concluded that CCSC has the accredited scope and competence to verify the Project with impartiality as well;
- The verification team was selected with due considerations given in terms of the competence and impartiality;
- The verification team carried out the verification work and compiled a verification report strictly following CCSC's Procedures for Implementation of Verification.

The verification report submitted by the verification team was subjected to a technical review and decision-making process, the technical reviewers and decision-makers are qualified and independent from the verification team. If any issue is raised during technical review and/or decision-making the same is to be discussed between the issue-raiser and the team leader as well as the PP. All issues must be satisfactorily addressed before the submission of the report for final approval. The persons who conducted the technical review and decision-making for the Project are shown in section B.2 this report and their Certificates of Competence can be found in Appendix 2 of this report.

The report approved by the authorized official of CCSC as the final report together with relevant documents are submitted to Gold Standard for request for issuance (only if an unconditioned positive verification/certification opinion is concluded).

SECTION G. Verification opinion

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The verification team assigned by the China Classification Society Certification Company (CCSC) concludes that the GS Project "Hebei Yingxin Glass Group Co. Ltd. Glass Furnace Flue Gas Waste Heat to Energy Project", as described in the monitoring plan contained in the registered PDD version 2.0, the approved transition documentation and Monitoring Report (version 02,18/05/2020), meets all relevant requirements of the GS project activities including article 12 of the Kyoto Protocol, the modalities and procedures for CDM and the subsequent decisions by the COP/MOP and CDM Executive Board and Gold Standard. The verification is conducted in line with the VVS requirements and GS4GG requirements.

The verification was executed by taking the following methods and in the following steps so far:

- Desk review of MR (Version 01, 09/04/2020)/6/and relative documents
- On-site inspection and interviews (14/05/2020-15/05/2020)
- Raise corrective action requests (CARs)
- Desk review of revised MR (Version 02, 18/05/2020 /7/ and responses to CARs
- Issue of this version of the verification report

The Project is implemented according to selected monitoring methodology and the monitoring plan contained in the registered PDD and the approved transition documentation. The monitoring equipment was installed, calibrated and maintained in a proper manner. The monitoring system is in place and the Project is generating GHG emission reductions as a GS project.

CCSC therefore issues the positive verification opinion expressed in the Certification statement in SECTION H.

SECTION H. Certification statement

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CCSC has carried out the 5th periodic verification of the Project "Hebei Yingxin Glass Group Co. Ltd. Glass Furnace Flue Gas Waste Heat to Energy Project" (GS750). This verification covers the period from 01/06/2018 to 31/12/2019 (first and last days included).

In the course of the verification, 2 Corrective Action Requests (CARs) and 0 Clarification Requests (CLs) were raised. The verification team also did not raise any Forward Action Request (FAR). The verification is based on the MR (Version 01) /6/, the revised MR (Version 02) /7/, the registered PDD /1/ and the registered validation report /5/, the verification reports for the previous monitoring periods/5/, the approved transition documentation/19/,Emission Reductions Calculation Spreadsheet /8/, and supporting documents /18/-/26/ available to CCSC.

As the result of the 5th periodic verification, CCSC confirms that:

- The GS project activity has been implemented and operated as per the registered PDD, the approved transition documentation and that all physical features (technology, project equipment, and monitoring and metering equipment) of the project are in place;
- The monitoring report and other supporting documents provided are complete in accordance with the latest applicable version of the completeness checklist for requests for issuance of VERs and in accordance with applicable CDM and GS requirements;
- The actual monitoring systems and procedures are in place and functional, and comply with the monitoring systems and procedures described in the monitoring plan of the registered PDD and the approved transition documentation;
- The monitoring plan is in accordance with the applied methodology, i.e. ACM0012, verison 3.2;
- The installed equipment for measuring parameters required for calculating emission reductions are calibrated appropriately.
- The GHG emission reductions are calculated without material omission, errors, misstatements and in a conservative and appropriate manner.

CCSC hereby certifies that the Project has achieved total amount of certified SDG impact (as per approved methodology) achieved in this monitoring period as follows:

SDG 7	The net electricity generation of the project	109885.090MWh
SDG 8	Permanent job positions created by the Project in this monitoring period (01/06/2018 to 31/12/2019)	24 persons
SDG 13	GHG emission reduction for Vintage of 01/06/2018 to 31/12/2018	34,195 tCO_2e
	GHG emission reduction for Vintage of 01/01/2019 to 31/12/2019	63,986 tCO_2e
	Total amount of GHG emission reductions or net GHG removals by sinks achieved in this monitoring period (01/06/2018 to 31/12/2019)	98,181 tCO_2e

For and on behalf of CCSC

Authorized Signature

Name: HUANG Shiyuan

Date: 04/06/2020

Appendix 1. Abbreviations

Abbreviations	Full texts
BE	Baseline emissions
CAR	Corrective Action Request
CCSC	China Classification Society Certification Company
CDM	Clean Development Mechanism
CL	Clarification request
CO_2	Carbon dioxide
CSPG	China Southern Power Grid
DOE	Designated operational entity
DNA	Designated National Authority
EB	Executive Board
EF	Emission factor
ER	Emission reduction
ETN	Electricity Transaction Note
FAR	Forward action request
GHG	Greenhouse gas(es)
GS	Gold Standard
GS4GG	Gold Standard for the Global Goals
IPCC	Intergovernmental Panel on Climate Change
LE	Leakage emissions
MP	Monitoring Plan
MR	Monitoring report
NGO	Non-governmental Organization
NCPG	North China Power Grid
PCP	Project Cycle Procedure
PDD	Project Design Document
PP	Project Participant
PS	Project Standard
SDGs	Sustainable Development Goals
tCO_2e	Tonne of carbon dioxide equivalent
UNFCCC	United Nations Framework Convention on Climate Change
VVS-PA	Validation and Verification Standard for Project Activity
WECM	Waste Energy Carrying Medium

Appendix 2. Competence of team members and technical reviewers

CCS 认证公司 CERTIFICATION

Appendix 9

CERTIFICATE OF COMPETENCE

Date of issue: 23/01/2020

Mr. Li Xingtong

Has been qualified in accordance with *CDM Personnel Competence Requirements and Professional Competence Evaluation Instructions* (CDMI0301) as

■ CDM validator for Technical Area(s): TA1.1/TA1.2/TA3.1/TA9.2/TA13.1

■ CDM verifier for Technical Area(s): TA1.1/TA1.2/TA3.1/TA9.2/TA13.1

□ Technical expert for Technical Area(s):_____

Huang ShiYuan
CCSC General Manager

CCS 认证公司 CERTIFICATION

Appendix 9

CERTIFICATE OF COMPETENCE

Date of issue: 23/01/2020

Mr. Li Yong

Has been qualified in accordance with *CDM Personnel Competence Requirements and Professional Competence Evaluation Instructions* (CDMI0301) as

■ CDM validator for Technical Area(s): TA1.2

■ CDM verifier for Technical Area(s): TA1.2

□ Technical expert for Technical Area(s):_____

Huang ShiYuan
CCSC General Manager

CCS 认证公司 CERTIFICATION

Appendix 9

CERTIFICATE OF COMPETENCE

Date of issue: 23/01/2020

Ms. Zhang Rui

Has been qualified in accordance with *CDM Personnel Competence Requirements and Professional Competence Evaluation Instructions* (CDMI0301) as

■ CDM validator for Technical Area(s): TA1.2

■ CDM verifier for Technical Area(s): TA1.2

□ Technical expert for Technical Area(s):_____

Huang ShiYuan
CCSC General Manager

CCS 认证公司

Appendix 9

CERTIFICATE OF COMPETENCE

Date of issue: 23/01/2020

Mr. Yong Hanlin

Has been qualified in accordance with *CDM Personnel Competence Requirements and Professional Competence Evaluation Instructions* (CDMI0301) as

■ CDM validator for Technical Area(s): TA1.1/TA1.2/TA8.1/TA10.1

■ CDM verifier for Technical Area(s): TA1.1/TA1.2/TA8.1/TA10.1

☐ Technical expert for Technical Area(s):_____

Huang ShiYuan
CCSC General Manager

CCS 认证公司

Appendix 9

CERTIFICATE OF COMPETENCE

Date of issue: 23/01/2020

Ms. Zheng Ying

Has been qualified in accordance with *CDM Personnel Competence Requirements and Professional Competence Evaluation Instructions* (CDMI0301) as

■ CDM validator for Technical Area(s): TA1.2/TA13.1

■ CDM verifier for Technical Area(s): TA1.2/TA13.1

☐ Technical expert for Technical Area(s):_____

Huang ShiYuan
CCSC General Manager

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
/1/	Swiss Carbon Assets Ltd..	GS-Project Design Document for Hebei Yingxin Glass Group Co. Ltd. Glass Furnace Flue Gas Waste Heat to Energy Project, version 2.0 dated 11 November 2010.	version 2.0 dated 11 November 2010.	PPs
/2/	ERM	Gold Standard Validation Report for Hebei Yingxin Glass Group Co. Ltd. Glass Furnace Flue Gas Waste Heat to Energy Project, version 02 of 21 July 2011.	Version 02 21/07/2011	PPs
/3/	Swiss Carbon Assets Ltd.	Gold Standard Passport for the project activity Hebei Yingxin Glass Group Co. Ltd. Glass Furnace Flue Gas Waste Heat to Energy Project, version 2 dated 8 May 2011.	Version 2 08/05/2011	PPs
/4/	Swiss Carbon Assets Ltd.	Monitoring Reports for Hebei Yingxin Glass Group Co. Ltd. Glass Furnace Flue Gas Waste Heat to Energy Project, 1st, 2nd, 3rd and 4th monitoring periods.	/	PPs
/5/	JCI & CTI &CCSC	Verification Reports for the previous monitoring periods of Hebei Yingxin Glass Group Co. Ltd. Glass Furnace Flue Gas Waste Heat to Energy Project,1st, 2nd, 3rd and 4th monitoring periods.	/	/
/6/	Swiss Carbon Assets Ltd.	Monitoring Report for Hebei Yingxin Glass Group Co. Ltd. Glass Furnace Flue Gas Waste Heat to Energy Project for 5th monitoring period, Monitoring Report Version 01 dated 09/04/2020	Version 01 09/04/2020	PPs
/7/	Swiss Carbon Assets Ltd.	Monitoring Report for Hebei Yingxin Glass Group Co. Ltd. Glass Furnace Flue Gas Waste Heat to Energy Project for 5th monitoring period, version 02, dated 18/05/2020	Version 02 17/05/2020	PPs
/8/	Swiss Carbon Assets Ltd.	ER calculation spreadsheet	/	PPs
/9/	Shahe Power Supply Company	Calibration reports of the electricity meters during this monitoring period	/	PPs
/10/	Bureau of Technical Supervision of Xingtai City	Ceritificate of Metrological Authorization for Special Items of Shahe Power Supply Company. issued on 02/08/2018 valid till 01/08/2022.	/	PPs
/11/	PPs	Training records related to operation, monitoring and safety dated 13/09/2018 and 16/04/2019	13/09/2018 16/04/2019	PPs
/12/	PPs	Management and Monitoring manual.	/	PPs
/13/	PPs	Power Plant Safety Operation Manual.	/	PPs
/14/	PPs	Project Introduction.	/	PPs
/15/	PPs	Daily operation records	/	PPs
/16/	PPs	Monthly Meter Reading records of electricity imported from 01/06/2018 to 31/12/2019.	/	PPs
/17/	PPs	Monthly Meter Reading records of electricity exported from 01/06/2018 to 31/12/2019.	/	PPs

/18/	Shahe Environmental Protection Monitoring Center	Air Quality Analysis Reports during operation period, dated 27/12/2017, 26/12/2018 and 23/12/2019.	27/12/2017 26/12/2018 23/12/2019	PPs
/19/	Swiss Carbon Assets Ltd.	The approved transition documentation	/	PPs
/20/	PPs	HR records in 2018 and 2019.	/	PPs
/21/	Shahe Environmental Protection Monitoring Center	Workplace Air Quality Analysis Report, dated 29/11/2017, 20/11/2018 and 15/11/2019	29/11/2017 20/11/2018 15/11/2019	PPs
/22/	PPs	Employ Satisfaction Survey Responses in 2018 and 2019.	/	PPs
/23/	Shahe Environmental Protection Monitoring Center	Noise Analysis Report, dated 1310/2017, 11/10/2018 and 29/09/2019.	13/10/2017 11/10/2018 29/09/2019	PPs
/24/	Shahe Environmental Protection Monitoring Center	Water Quality Analysis Reports, dated 12/09/2017, 10/09/2018 and 05/09/2019.	12/09/2017 10/09/2018 05/09/2019	PPs
/25/	PPs	Business License of the PPs of the host country	/	PPs
/26/	PPs	Diagram of power connection system.	/	PPs
/27/	Fangyuan Certification Group Limited	Certificate of Occupation Health Safety Management System, 10/08/2015 valid till 09/08/2018 and 10/08/2018 valid till 09/08/2021.	/	/
/28/	Fangyuan Certification Group Limited	Certificate of Environmental Management System, 10/08/2015 valid till 09/08/2018 and 10/08/2018 valid till 09/08/2021.	/	PPs
/29/	/	nameplates	/	PPs
/30/	Swiss Carbon Assets Ltd.	The Letter of Confirmation on Avoid Double Counting	/	PPs
/31/	Department of Industry and Transport Statistics of National Statistics Bureau and Energy Bureau of NDRC of China	China Energy Statistical Yearbook 2011.	/	others
/32/	IPCC	Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories (Energy).	/	others
/33/	IPCC	2006 IPCC guidelines for national greenhouse gas inventories reference manual, 2006.	/	others
/34/	State Economic and Trade Commission	Technical administrative code of electric energy metering (DL/T 448-2000), dated 3 November 2000.	03/11/2000	Others
/35/	National Committee on AC power measurement technology	Verification Regulation of Electrical Energy Meters with Electronics (JJG596-1999), dated 15 March 2000.	15/03/2000	Others
/36/	General Administration of Quality Supervision,Inspec	Emission standard of air pollutants for flat glass industry, GB26453-2011, 2 April 2011.	02/04/2011	Others

	tion and Quarantine of the People's Republic of China			
/37/	Ministry of Health of the People's Republic of China	Hygienic standards for the Design of Industrial Enterprises GBZ 1-2002, 8 April 2002.	08/04/2002	Others
/38/	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.	01/10/2008	Others
/39/	General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China	Integrated Wastewater Discharge Standard GB8978-1996, 4 October 1996.	04/10/1996	Others
/40/	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.	12/04/1996	Others
/41/	UNFCCC	Validation and Verification Standard Version 02.0 dated 29 November 2018	Version 02.0 29/11/2018	Others
/42/	UNFCCC	Project Standard Version 02.0 dated 29 November 2018	Version 02.0 29/11/2018	Others
/43/	UNFCCC	Project Cycle Procedure Version 02.0 dated 29 November 2018	Version 02.0 29/11/2018	Others
/44/	UNFCCC	Consolidated baseline methodology for GHG emission reductions from waste energy recovery projects, ACM0012, version 3.2.	Version 3.2	Others
/45/	UNFCCC	Tool to calculate the emission factor for an electricity system, version05.2.	Version 05.2	Others
/46/	GS	Gold Standard for the Global Goals (GS4GG) Monitoring report form, Version 1 dated June 2017	Version 1 01/06/2017	Others
/47/	GS	GS4GG Principles & Requirements Version 1.1, dated 01.03.2018	Version 1.1 01/03/2018	Others

Appendix 4. Clarification requests, corrective action requests and forward action requests

Table 1. Remaining FAR from validation and/or previous verifications

FAR ID	N/A	**Section no.**	N/A	**Date:** /
Description of FAR				
N/A				
Project participant response				**Date:** /
N/A				
Documentation provided by project participant				
N/A				
DOE assessment				**Date:** /
N/A				

Table 2. CL from this verification

CL ID	N/A	**Section no.**	N/A	**Date:** /
Description of CL				
N/A				
Project participant response				**Date:** /
N/A				
Documentation provided by project participant				
N/A				
DOE assessment				**Date:** /
N/A				

Table 3. CAR from this verification

CAR ID	**CAR-1**	**Section no.**	E7	**Date: 15/05/2020**
Description of CAR				
Through checking the calibration records, all the meters have been calibrated and the five-year calibration frequency is in accordance with the requirement of JJG596-1999. According to the registered GS-PDD, meter calibration frequency should be once per year. Therefore, a conservative approach is adopted in the calculation of emission reductions for the project activity by the PP. A description about the calibration delay and the conservative method adopted by the PP should be described in the Monitoring Report.				
Project participant response				**Date: 18/05/2020**
The description about the calibration delay and the conservative method is added in the revised MR.				
Documentation provided by project participant				
MR_Yingxin WHR_GS750 version 02				
DOE assessment				**Date: 18/05/2020**
By reviewing the revised MR version 02, the verification team confirmed that the calibration delay and the conservative method to assess the time gap of calibrations was reasonable and acceptable. CAR-1 was closed.				

CAR ID	**CAR-2**	**Section no.**	E6.2	**Date: 15/05/2020**
Description of CAR				

By checking the monitoring report of the project, Parameter Quantity of total electricity generation （$Q_{OE,y}$）is missing in the Monitoring Report version 01.
Project participant response **Date: 18/05/2020**
$Q_{OE,y}$ is added in the revised MR.
Documentation provided by project participant
MR_Yingxin WHR_GS750 version 02
DOE assessment **Date: 18/05/2020**
By reviewing the revised MR version 02, the verification team confirmed that Quantity of total electricity generation （$Q_{OE,y}$） was reported in the MR in accordance with the registered monitoring plan. CAR-2 was closed.

Table 4. FAR from this verification

FAR ID	N/A	**Section No.**	/	**Date:** /
Description of FAR				
/				
Project participant response				**Date:** /
/				
Documentation provided by project participant				
/				
DOE assessment				**Date:** /
/				/