Monitoring report form

Monitoring report

Title of the project activity	Hebei Yingxin Glass Group Co. Ltd. Glass Furnace Flue Gas Waste Heat To Energy Project
Reference number of the project activity	GS 750
Version number of the monitoring report	2.0
Completion date of the monitoring report	21/02/2017
Monitoring period number and duration of this monitoring period	3rd monitoring period From 01/04/2014 to 31/12/2016
Project participant(s)	Hebei Yingxin Glass Group Co. Ltd. (Project Owner) Swiss Carbon Assets Ltd. (Purchaser of GS VERs)
Host Party(ies)	People's Republic of China (Host)
Sectoral scope(s) and applied methodology(ies)	1 Energy industries (renewable - / non-renewable sources) 4 Manufacturing industries ACM0012, Version 3.2
Estimated amount of GHG emission reductions or net anthropogenic GHG removals by sinks for this monitoring period in the registered PDD	67,906 / 365 * (275+365+366) = 187,160 tCO2e
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period	168,194 tCO2e

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

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Purpose of the project activity is to utilize waste heat of the glass furnaces to produce electricity for self-use of Hebei Yingxin Glass Group Co. Ltd. (Project Owner). The electricity generated can meet part of the electricity demand of the company thereby displacing electricity generation from grid connected fossil fuel-fired power plants of North China Power Grid (NCPG). In the absence of the project, the waste heat would be vented into the atmosphere. Thus the project can reduce greenhouse gas emissions.

The project installs four recovery boilers with two sets of condensing turbine generator units. The installed capacity is 12 MW, consisting of two 6 MW units.

A.2. Location of project activity

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The project is located in Donghuan Road, Shahe City (county-level city), Xingtai City, Hebei Province, P.R. China. The plant is near by national road G107. The exact location of the plant is 36˚51'18"N, 114˚30'11"E.

A.3. Parties and project participant(s)

Party involved ((host) indicates a host Party)	Private and/or public entity(ies) project participants (as applicable)	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
People's Republic of China (host)	Hebei Yingxin Glass Group Co. Ltd. (Project Owner)	No

Switzerland	Swiss Carbon Assets Ltd. (Purchaser of GS VERs)	No

A.4. Reference of applied methodology

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UNFCCC Approved consolidated baseline and monitoring methodology ACM0012 Version 3.2: "Consolidated baseline methodology for GHG emission reductions from waste energy recovery projects".

The ACM0012 methodology refers to the Version 02 of the "Tool to calculate the emission factor for an electricity system" and Version 05.2 of the "Tool for the Demonstration and Assessment of Additionality".

For detailed information on the methodology and related tools please refer to: http://cdm.unfccc.int/methodologies/PAmethodologies/approved

A.5. Crediting period of project activity

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Type of the crediting period of this monitoring period: fixed.

The starting date of the crediting period of the project activity is 1 January 2010 and the end date is 31 December 2019. The total number of years is 10 years.

The starting date of this monitoring period is 1 April 2014 and the end date is 31 December 2016.

SECTION B. Implementation of project activity

B.1. Description of implemented registered project activity

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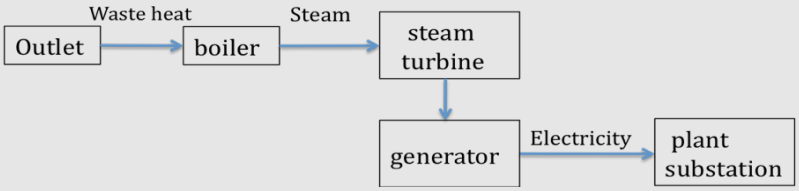
The project activity completed its construction on 12 August 2009, and the equipment commissioning started on 12 August 2009.

The project activity consists of one site only and the implementation is not phased.

The waste heat 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 process of the Project Activity is as below:



Please find the information of equipment applied in the project activity:

Equipment	Technical Information
Generator 1	Type: QF-J6-2 Rated Power: 6 MW Rated speed: 3000 r/min Manufacturer: Hangzhou Electrical Equipment Works Serial number: 2008-111-2
Generator 2	Type: QF-J6-2 Rated Power: 6 MW Rated speed: 3000 r/min Manufacturer: Hangzhou Electrical Equipment Works Serial number: 2008-111-1

Turbine 1	Type: N6-2.35 Capacity: 6 MW Rated speed: 3000 r/min Manufacturer: Hangzhou Chinen Steam Turbine Power Co., Ltd Serial number: HS4513
Turbine 2	Type: N6-2.35 Capacity: 6 MW Rated speed: 3000 r/min Manufacturer: Hangzhou Chinen Steam Turbine Power Co., Ltd Serial number: HS4503
Waste Gas Recovery Boiler 1	Type: QCF 110/500-15-2.5/420 Capacity: 16 t/h Manufacturer: Hangzhou Boiler Company Serial number: 6988001
Waste Gas Recovery Boiler 2	Type: QCF 110/500-18-2.5/420 Capacity: 17 t/h Manufacturer: Hangzhou Boiler Company Serial number: 66987001
Waste Gas Recovery Boiler 3	Type: QCF 110/500-18-2.5/420 Capacity: 16 t/h Manufacturer: Hangzhou Boiler Company Serial number: 66987002
Waste Gas Recovery Boiler 4	Type: QCF 110/500-15-2.5/420 Capacity: 11 t/h Manufacturer: Hangzhou Boiler Company Serial number: 66986002

During this monitoring period (01/04/2014 - 31/12/2016), the project activity is operating normally and the implementation status is stable. No equipment was exchanged or overhauled.

No events or situation that occurred during the monitoring period, which may impact the GHG emission reductions or removals and monitoring.

B.2. Post registration changes

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

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No temporary deviations from registered monitoring plan or applied methodology.

B.2.2. Corrections

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No correction.

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

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Not applicable.

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

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No changes to project design of registered project activity.

B.2.5. Changes to start date of crediting period

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No change to start date of crediting period.

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

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Not applicable.

SECTION C. Description of monitoring system

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Data collection procedures

1. Data generation: Electricity data are measured by calibrated power meters, which are operated and maintained by the project owner.

2. Data recording and transfer: First, the data measured are manually recorded by onsite staffs in the daily operation report. Second, the onsite manager approves daily operation report and transfers the data to monthly report. Third, at the end of each month, GS VER supervisor checks the monthly report and sends it to Swiss Carbon Assets Ltd.

3. Data aggregation: The calculated net power output is aggregated monthly.

4. Calculation: Total electricity generation ($Q_{OE,y}$), Electricity exported to the glass plant by the Project ($EG_{export,y}$) and Electricity imported to the proposed project from the Grid ($EG_{imported,\ y}$) per month are the difference between the cumulative values on the power meters. Net electricity output by the project activity (EG_y) is Electricity exported ($EG_{export,y}$) minus Electricity Imported ($EG_{imported,\ y}$). See section E for calculations of emission reductions.

5. Reporting: The calculated values are included in an Excel sheet and reported in the MR.

Organizational structure, roles and responsibilities

A GS VER supervisor has been appointed and trained who is responsible for the GS VER monitoring system. Monthly recording of power meters falls under the responsibility of the site.

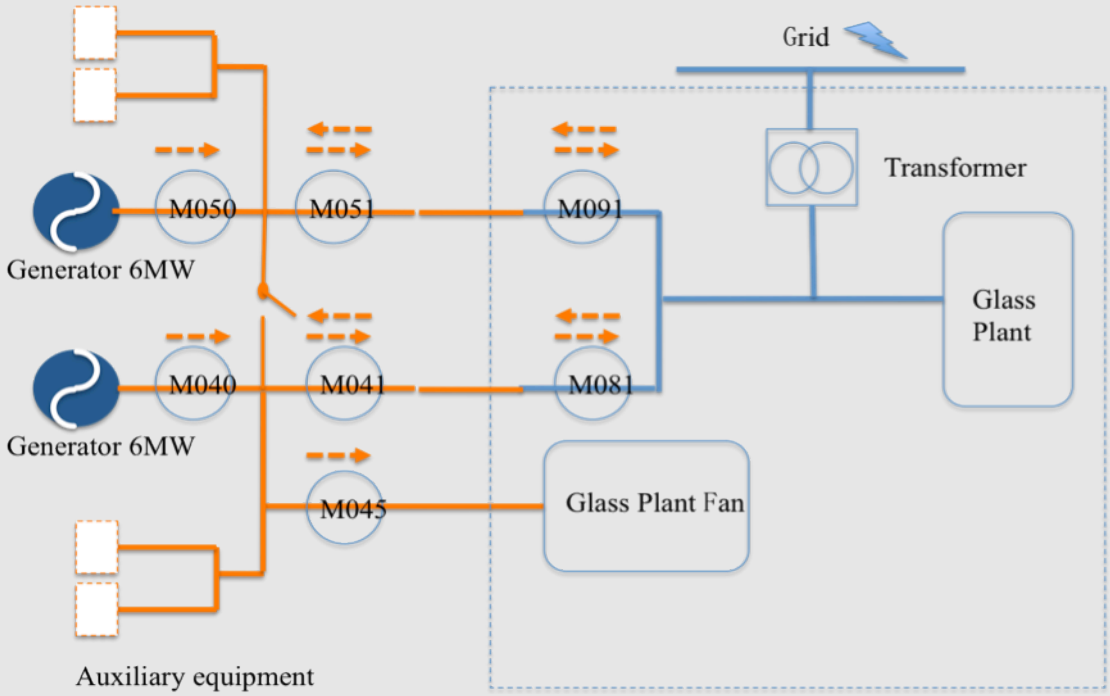
Three level training are provided, which are company safety training, workshop safety training and team safety training. The target group of company safety training is all the employees of Yingxin Glass Group, especially the new employees. They receive intensive training on safety before practical operation. When new employees get familiar with general company safety rules, they are allocated to different workshops. The detailed technical training is provided during workshop training. From which employees understand production management and equipment operation. Then employees are allocated to different teams under workshops. Responsibilities to each individual according to his/her position are clarified.

Emergency procedures for the monitoring system

The GS VER supervisor notifies the manufacturer and the equipment maintenance team in case there is doubt about the correct functioning of the meters mentioned in the monitoring plan. In that case, manufacturer or the maintenance team check, repair and where necessary replace the meters. No GS VERs are claimed for the period during which the meters were not functioning correctly. During this monitoring period, the meters have been working properly.

Line Diagram

Please find monitoring line diagram below. The numbers in the line diagram are meter tag numbers.



M050, M040 are used for total electricity generation ($Q_{OE,y}$).

M045, bidirectional meters M091 and M081 are used for net electricity output by the project activity (EG_y).

M051 and M041, which are installed at generation side, are used to crosscheck M091 and M081[1].

All meters are calibrated[2] by Shahe Power Supply Company as per Verification Regulation of Electrical Energy Meters with Electronics (JJG596-1999)[3], Please find Calibration and Accuracy of Meters Sheet below:

Calibration and Accuracy of Meters Sheet

[1] A small amount of electricity is exported to the glass plant fan directly due to short distance and only one meter (M045) is installed.

[2] All these meters have been calibrated respectively and the five-year calibration frequency is in accordance with the requirement of JJG596-1999.
But according to the MP of the GS-PDD and previous MR, meter calibration frequency should be once per year. Therefore, a conservative approach is adopted in the calculation of emission reductions for the project activity:
Emission reductions can be discounted by applying the maximum permissible error of the electricity meters measuring electricity values. Here the full accuracy level (0.5% for meters M091, M081 and M045) of the electricity meter is applied to the deduction from the electricity supplied to the grid (-0.5% for exports) as well as the increase to the electricity imported from the grid (+0.5% for imports); for calculation of f_{cap}, the full accuracy level of 0.2% for meters M050 and M040 is applied to the increase of total electricity generated by the two generators ($Q_{OE,y}$). So that the net electricity values claiming for emission reductions, which are calculated by deducting electricity imported from electricity exported, will be conservative; and the f_{cap} determined by $Q_{OE,BL}/Q_{OE,y}$ will also be conservative.

[3] In the registered PDD, the standard of Technical Administrative Code of Electric Energy Metering (DL/T448-2000) was referred to. However as the local calibration company follows the Verification Regulation of Electrical Energy Meters with Electronics (JJG596-1999), which is also a national standard and widely used in the industry. Therefore it is acceptable.

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	16/10/2011	15/10/2016	20111016006
						15/10/2016	14/10/2021	20161016012
$Q_{OE,y}$	040	500004	DSSD331	Generator	0.2S	16/10/2011	15/10/2016	20111016005
						15/10/2016	14/10/2021	20161016004
$EG_{export,y}$ $EG_{import,y}$	051	500001	DSSD331	Control room	0.2S	16/10/2011	15/10/2016	20111016004
						15/10/2016	14/10/2021	20161016014
$EG_{export,y}$ $EG_{import,y}$	041	500005	DSSD331	Control room	0.2S	16/10/2011	15/10/2016	20111016003
						15/10/2016	14/10/2021	20161016063
$EG_{export,y}$	045	550476	DSSD331	Control room	0.5	13/09/2011	12/09/2016	20111016011
						12/09/2016	11/09/2021	20161016021
$EG_{export,y}$ $EG_{import,y}$	081	006513	DSSD904	Glass furnace room	0.5S	16/10/2011	15/10/2016	20111016002
						15/10/2016	14/10/2021	20161016102
$EG_{export,y}$ $EG_{import,y}$	091	006519	DSSD904	Glass furnace room	0.5S	16/10/2011	15/10/2016	20111016001
						15/10/2016	14/10/2021	20161016011

SECTION D. Data and parameters

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

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

Data / Parameter:	$EF_{grid,CM,y}$
Unit:	tCO_2/MWh
Description:	CO_2 emission factor for the electricity source i (i=gr (grid) or i=is (identified source)), displaced due to the project activity, during the year y in tons CO_2/MWh
Source of data:	Calculated according to the procedure outlined in B.6.1 of the registered PDD
Value(s) applied):	0.8935
Purpose of data:	Used for Baseline emission calculation Calculated on an ex-ante basis. The emission factor will not be updated during the crediting period.
Additional comment:	For this and other descriptions relating to this parameter, see the description in Section B.6.2 of the registered PDD, Data and parameters that are available at validation.

Data / Parameter:	$Q_{OE,BL}$
Unit:	MWh
Description:	Output energy (i.e. electricity) that can be theoretically produced (in MWh), to be determined on the basis of maximum recoverable energy from the WECM, which would have been released in the absence of project activity.
Source of data:	Feasibility Study Report

Value(s) applied):	86,400 MWh (the total electricity generation)
Purpose of data:	Used for Baseline emission calculation
Additional comment:	This is to determine the f_{cap}

D.2. Data and parameters monitored

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

Data / Parameter:	EG_y
Unit:	MWh
Description:	Net electricity output by the project activity
Measured/ Calculated / Default:	Calculated
Source of data:	Power meters
Value(s) of monitored parameter:	01/04/2014 – 31/12/2014: 52,306.55 MWh (after conservative calculation[4]) 01/01/2015 – 31/12/2015: 68,446.36 MWh (after conservative calculation) 01/01/2016 – 31/12/2016: 67,490.90 MWh (after conservative calculation)
Monitoring equipment:	Three electricity meters (M045, bidirectional meter M091 and M081) are used for net electricity output by the project activity. Please refer to Calibration and Accuracy of Meters Sheet in section C.
Measuring/ Reading/ Recording frequency:	Read and recorded on daily basis and aggregated monthly
Calculation method (if applicable):	$EG_y = EG_{export,y} – EG_{imported,y}$
QA/QC procedures:	The calculation result will be crosschecked with data measured at generation plant
Purpose of data:	Used for Baseline emission calculation
Additional comment:	-

Data / Parameter:	$Q_{OE,y}$
Unit:	MWh
Description:	Quantity of total electricity generation during the year y
Measured/ Calculated / Default:	Measured
Source of data:	Measurement records

[4] The calibration was performed each 5 years, instead of annually. To be conservative, by applying the maximum permissible error of the meter a 0.5% discount rate was applied to EGexport, y and a 0.5% increase rate was applied to EGimport,y.

Value(s) of monitored parameter:	01/04/2014 – 31/12/2014: 55,862.59 MWh 01/01/2015 – 31/12/2015: 73,119.81 MWh 01/01/2016 – 31/12/2016: 72,074.83 MWh
Monitoring equipment:	Two electricity meters (M050 and M040) are used for measuring total electricity generation. Please refer to Calibration and Accuracy of Meters Sheet in section C.
Measuring/ Reading/ Recording frequency:	Read and recorded on daily basis and aggregated monthly
Calculation method (if applicable):	N/A
QA/QC procedures:	Direct measurement by project participant through standard power meters. The electricity amount will be monitored continuously and recorded monthly. The meters would be calibrated every year according to national Verification Regulation of Electrical Energy Meters with Electronics (JJG 596- 1999). The accuracy of meters is no worse than 1.0. All the data must be kept for at least two years after the end of the crediting period.
Purpose of data:	Baseline emission
Additional comment:	-

Data / Parameter:	$EG_{export,y}$
Unit:	MWh
Description:	Electricity exported by the project activity to the plant during year y in MWh which is used to calculate emission reduction
Measured/ Calculated / Default:	Measured
Source of data:	Power meters
Value(s) of monitored parameter:	01/04/2014 – 31/12/2014: 52,600.20 MWh 01/01/2015 – 31/12/2015: 68,835.76 MWh 01/01/2016 – 31/12/2016: 67,879.54 MWh
Monitoring equipment:	Three electricity meters (M045, M091 and M081) are used for measuring electricity exported by the project activity to the plant. Please refer to Calibration and Accuracy of Meters Sheet in section C.
Measuring/ Reading/ Recording frequency:	Read and recorded on daily basis and aggregated monthly
Calculation method (if applicable):	N/A
QA/QC procedures:	The meters would be calibrated every year according to national Verification Regulation of Electrical Energy Meters with Electronics (JJG 596- 1999). The accuracy of meters is no worse than 0.5. All the data must be kept for at least two years after the end of the crediting period.
Purpose of data:	Baseline emission
Additional comment:	-

Data / Parameter:	$EG_{imported,y}$
Unit:	MWh
Description:	Electricity imported by the project activity from the grid during year y, which is used to calculate emission reduction
Measured/ Calculated / Default:	Measured
Source of data:	Power meters
Value(s) of monitored parameter:	01/04/2014 – 31/12/2014: 30.50 MWh 01/01/2015 – 31/12/2015: 45.00 MWh 01/01/2016 – 31/12/2016: 49.00 MWh
Monitoring equipment:	Two electricity meters (M091 and M081) are used for measuring electricity imported by the project activity from the grid. Please refer to Calibration and Accuracy of Meters Sheet in section C.
Measuring/ Reading/ Recording frequency:	Read and recorded on daily basis and aggregated monthly
Calculation method (if applicable):	N/A
QA/QC procedures:	The meters would be calibrated every year according to national Verification Regulation of Electrical Energy Meters with Electronics (JJG 596- 1999). The accuracy of meters is no worse than 0.5. All the data must be kept for at least two years after the end of the crediting period.
Purpose of data:	Project emission
Additional comment:	-

D.3. Implementation of sampling plan

>>

N/A

D.4. Other data and parameters monitored

No	1
Indicator	Air Quality during construction period
Mitigation measure	The major ambient air pollutant during construction period is dust. A 2 m height dust fence will be built around the project construction site and water sprayed at the construction site on a regular basis. For the onsite workers, masks would be dispensed. Construction residues would be covered to reduce dust, guaranteeing the onsite workers' health.
Repeat for each parameter	
Chosen parameter	Dust development during construction
Current situation of parameter	N/a
Estimation of baseline situation of parameter	N/a

Future target for parameter		Potential dust development during construction shall be controlled within the plant area
Way of monitoring	How	Photo or documentation records shall provide evidence that the mitigation measures and PPE had been implemented.
	When	Once upon validation
	By who	Monitored by Yingxin and validated by DOE

No		2
Indicator		Air Quality during operating period
Mitigation measure		N/A as indicator scores positive
Repeat for each parameter		
Chosen parameter		Dust and SO_2 concentration at exhaust pipe
Current situation of parameter		Before PA: Dust concentration=167 mg/m^3 < 200 mg/m^3; SO_2=645 mg/m^3 < 800 mg/m^3 (GB9078-1996)
Estimation of baseline situation of parameter		N/a
Future target for parameter		Lower dust concentration is expected
Way of monitoring	How	Measurement of dust and SO_2 concentration at exhaust pipe during normal operating time.
	When	Annually
	By who	Performed by Yingxin and Verified by DOE

No		3
Indicator		Quality of employment
Mitigation measure		N/A as indicator scores positive
Repeat for each parameter		
Chosen parameter		Permanent job positions, fire protection measures, workplace air quality
Current situation of parameter		In absence of the Project, no more permanent job positions will be offered.
Estimation of baseline situation of parameter		N/a
Future target for parameter		24 (job positions created solely by the PA) The workplace air quality follows national standard (GBJ16-87 and GBZ1-2002); The fire protection equipments are in place; the employees receive fire protection training.
Way of monitoring	How	Employment numbers and their relation to the permanency of a job are reported in HR data Certification from government or third party regarding workplace air quality Fire protection equipments list and training records
	When	Annually
	By who	Monitored by Yingxin or third party and Verified by DOE

No		4
Indicator		Human and institutional capacity
Mitigation measure		N/A as indicator scores positive
Repeat for each parameter		
Chosen parameter		Female employment (number and job related education).
Current situation of parameter		0
Estimation of baseline situation of parameter		N/a
Future target for parameter		≥ 1
Way of monitoring	How	Female employment and training records for female employees are reported in HR data

	When	Annually
	By who	Monitored by Yingxin

No		5
Indicator		Quantitative employment and income generation
Mitigation measure		N/A as indicator scores positive
Repeat for each parameter		
Chosen parameter		Number of jobs and income satisfaction rate
Current situation of parameter		0 (In the absence of the Project, no additional employment opportunities would be generated)
Estimation of baseline situation of parameter		
Future target for parameter		Permanent job positions created solely by the PA: Number of jobs: 24 positions The employees are satisfied with the income.
Way of monitoring	How	HR data of job number and income will be copied and stored for verification check. Interviews will be performed with employees regarding satisfaction on income level and interview records will be stored for verification check.
	When	Annually
	By who	Monitored by Yingxin

No		6
Indicator		Noise
Mitigation measure		Install noise reduction equipment and protection measures for personnel
Repeat for each parameter		
Chosen parameter		Implementation of noise reduction equipment for generators and protection measures for personnel
Current situation of parameter		N/a
Future target for parameter		The noise reduction equipment and personal protective equipment are implemented. The noise level follows the national standards, i.e. GBJ 87-85 and GB12348-1990.
Way of monitoring	How	Certificate from third party or authority Staff will check the installation and protection measures and maintain reporting log. The reporting log will be presented for the DOE's review and interviews with the plant employees will be performed as well.
	When	Annually
	By who	Project owner, qualified third party or local environmental protection authority

No		7
Indicator		Water quality
Mitigation measure		
Repeat for each parameter		
Chosen parameter		Wastewater treatment
Current situation of parameter		N/a
Future target for parameter		Circulating cooling water, boiler blow down water and municipal wastewater properly treated, as per national standards.
Way of monitoring	How	Layout of wastewater treatment system will be provided for better understanding on how the wastewater is treated by the PO. Certificate from third party or government will be provided to prove that wastewater is treated in accordance with national standards.
	When	Annually

	By who	Project owner or third party

No		8
Indicator		Air quality of whole glass plant area after the PA
Mitigation measure		N/A
Repeat for each parameter		
Chosen parameter		Dust and SO_2 concentration in atmosphere
Current situation of parameter (before PA)		Dust concentration<0.15 mg/m^3, SO2< 0.30 mg/m^3
Future target for parameter (after PA)		Dust concentration<0.15 mg/m^3, SO2< 0.30 mg/m^3
Way of monitoring	How	Measurement of dust and SO_2 concentration in atmosphere by third party or government. Report or certificate will be reviewed by DOE during verification.
	When	Once upon the first verification
	By who	Local authority

No		9
Indicator		Safe and healthy work environment for workers of the whole plant
Mitigation measure		N/A
Repeat for each parameter		
Chosen parameter		Plant safety regulation and training; work environment status
Current situation of parameter (before PA)		N/A
Future target for parameter (after PA)		The plant safety measures are in place; work environment is healthy
Way of monitoring	How	Plant safety measures, regulation and training records; Employee interview records on work environment; Certificate for work environment from third party or authority
	When	Annually
	By who	PO and third party or authority

No		10
Indicator		Furnace waste refractory brick disposal
Mitigation measure		N/A
Repeat for each parameter		
Chosen parameter		Furnace waste refractory brick disposal with proper hazardous waste management measures
Current situation of parameter (before PA)		In case any disposal of waste refractory brick from the furnace, a licensed hazardous waste treatment company would be used for proper hazardous waste disposal and treatment.
Future target for parameter (after PA)		Status quo ante
Way of monitoring	How	Maintenance records of glass furnace. Order forms and transfer manifests with the licensed third party that is handling waste refractory brick would be kept for records.
	When	Annually
	By who	PO

SECTION E. Calculation of emission reductions or GHG removals by sinks

E.1. Calculation of baseline emissions or baseline net GHG removals by sinks

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Summary tables for year 2014, 2015 and 2016 including the calculation of baseline emissions, applying actual values, formulae and descriptions are as below. Please refer to ER calculation sheet for detailed monthly electricity generation and emission reduction calculation.

2014:

Calculation of baseline emissions	Symbol	Amount	Unit	Formula	Notes
Electricity exported by the project activity to the plant	EGexport, y	52337	MWh		1
Electricity imported by the project activity from the grid	EGimported, y	31	MWh		2
Net electricity production by the project activity	EGy	52307	MWh	EGy =EGexport, y-EGimported, y	
Emission factor	EFgrid,CM,y	0.8935	on/MWh		3
Total electricity generated by project activity	QOE,y	55974	MWh		4
Annual electricity output that can be theoretically produced in this monitoring period	QOE,BL	65096	MWh/y		5
fcap	fcap	1.00		fcap=QOE,BL/QOE,y	6
Total baseline emissions	BEy	46735.00	ton	BEy=EGy*fcap*EFgrid,CM,y	

Note: due to the calibration was performed each 5 year instead of annually, by applying the maximum permissible error of the meter an increase rate of 0.2% was applied to $Q_{OE,y}$.

2015:

Calculation of baseline emissions	Symbol	Amount	Unit	Formula	Notes
Electricity exported by the project activity to the plant	EGexport, y	68492	MWh		1
Electricity imported by the project activity from the grid	EGimported, y	45	MWh		2
Net electricity production by the project activity	EGy	68446	MWh	EGy =EGexport, y-EGimported, y	
Emission factor	EFgrid,CM,y	0.8935	on/MWh		3
Total electricity generated by project activity	QOE,y	73266	MWh		4
Annual electricity output that can be theoretically produced in this monitoring period	QOE,BL	86400	MWh/y		5
fcap	fcap	1.00		fcap=QOE,BL/QOE,y	6
Total baseline emissions	BEy	61156	ton	BEy=EGy*fcap*EFgrid,CM,y	

2016:

Calculation of baseline emissions	Symbol	Amount	Unit	Formula	Notes
Electricity exported by the project activity to the plant	EGexport, y	67540	MWh		1
Electricity imported by the project activity from the grid	EGimported, y	49	MWh		2
Net electricity production by the project activity	EGy	67491	MWh	EGy =EGexport, y-EGimported, y	
Emission factor	EFgrid,CM,y	0.8935	on/MWh		3
Total electricity generated by project activity	QOE,y	72219	MWh		4
Annual electricity output that can be theoretically produced in this monitoring period	QOE,BL	86637	MWh/y		5
fcap	fcap	1.00		fcap=QOE,BL/QOE,y	6
Total baseline emissions	BEy	60303	ton	BEy=EGy*fcap*EFgrid,CM,y	

Notes
1 power meter readings
2 power meter readings
3 fixed for this crediting period
4 power meter readings
5 Feasibility study report and days of this monitoring period
6 as per methodology and PDD

Electricity output measured by meter M091 and M081 at recipient side is crosschecked with the output measured by meter M051 and M041 at generation side. The crosschecked results are summarized in the following table and it shows the monitoring system is accurate and reliable, with minor difference due to line loss.

Year	Theoretical Line Loss	Actual Line Loss	Theoretical Line Loss	Actual Line Loss
	M051 – M091	M051 – M091	M041 – M081	M041 – M081
2014	0.69%	0.86%	0.65%	0.84%
2015	0.69%	0.76%	0.64%	0.77%
2016	0.66%	0.58%	0.64%	0.77%
Total	**0.68%**	**0.72%**	**0.65%**	**0.79%**

As shown in the table above, the actual line losses calculated based on actual meter readings during this monitoring period are all slightly higher than the theoretical line losses calculated based on equipment parameters of electricity transmission line. So the line loss between generation side and recipient side is reasonable.

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

>>

There is no project emission for the project during this monitoring period.

Calculation of project emissions					
Total project emissions	PEy	0	ton	N/a	1

Notes
1 as per methodology and PDD

E.3. Calculation of leakage

>>

There is no leakage for the project during this monitoring period.

Calculation of leakage emissions					
Total leakage emissions	Ly	0	ton	N/a	1

Notes
1 as per methodology and PDD

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

Since the calibration was performed each five year instead of annually, the emission reductions are recalculated by applying the maximum permissible error (0.5%) of the instrument to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration according to the Project Standard (04/2014 to 12/2016).

2014:

Period	Electricity export (MWh)	Electricity export after discount of 0.5% (MWh)	Electricity import (MWh)	Electricity import after increase of 0.5% (MWh)	Net electricity (MWh)	Emission reduction (tCO_2e)

01/04/2014 - 25/04/2014	5984.62	5954.70	2.80	2.81	5951.88	5318.01
26/04/2014 - 25/05/2014	5239.68	5213.48	2.60	2.61	5210.87	4655.91
26/05/2014 - 25/06/2014	6021.26	5991.15	4.60	4.62	5986.53	5348.97
26/06/2014- 25/07/2014	5178.66	5152.77	2.90	2.91	5149.85	4601.39
26/07/2014 - 25/08/2014	5601.68	5573.67	3.50	3.52	5570.15	4976.93
26/08/2014 - 25/09/2014	6352.36	6320.60	3.50	3.52	6317.08	5644.31
26/09/2014 - 25/10/2014	6148.94	6118.20	3.30	3.32	6114.88	5463.64
26/10/2014 - 25/11/2014	6292.54	6261.08	2.80	2.81	6258.26	5591.76
26/11/2014 - 31/12/2014	5780.46	5751.56	4.50	4.52	5747.04	5134.98
Total	52600.20	52337.20	30.50	30.65	52306.55	46735.90

2015:

Period	Electricity export (MWh)	Electricity export after discount of 0.5% (MWh)	Electricity import (MWh)	Electricity import after increase of 0.5% (MWh)	Net electricity (MWh)	Emission reduction (tCO_2e)
01/01/2015 - 25/01/2015	4757.42	4733.63	4.20	4.22	4729.41	4225.73
26/01/2015 - 25/02/2015	5922.78	5893.17	2.90	2.91	5890.25	5262.94
26/02/2015 - 25/03/2015	5545.14	5517.41	3.90	3.92	5513.49	4926.31
26/03/2015 - 25/04/2015	6070.72	6040.37	4.00	4.02	6036.35	5393.48
26/04/2015 - 25/05/2015	5495.60	5468.12	3.30	3.32	5464.81	4882.80
26/05/2015 - 25/06/2015	5691.34	5662.88	3.80	3.82	5659.06	5056.37
26/06/2015- 25/07/2015	5192.68	5166.72	2.70	2.71	5164.00	4614.04
26/07/2015 - 25/08/2015	5581.58	5553.67	3.70	3.72	5549.95	4958.88
26/08/2015 - 25/09/2015	6048.36	6018.12	6.40	6.43	6011.69	5371.44
26/09/2015 - 25/10/2015	6461.02	6428.71	2.00	2.01	6426.70	5742.26
26/10/2015 - 25/11/2015	6286.64	6255.21	3.90	3.92	6251.29	5585.53

26/11/2015 - 31/12/2015	5782.48	5753.57	4.20	4.22	5749.35	5137.04
Total	68835.76	68491.58	45.00	45.23	68446.36	61156.82

2016:

Period	Electricity export (MWh)	Electricity export after discount of 0.5% (MWh)	Electricity import (MWh)	Electricity import after increase of 0.5% (MWh)	Net electricity (MWh)	Emission reduction (tCO_2e)
01/01/2016 - 25/01/2016	4803.32	4779.30	4.00	4.02	4775.28	4266.72
26/01/2016 - 25/02/2016	5470.78	5443.43	5.50	5.53	5437.90	4858.76
26/02/2016 - 25/03/2016	5919.14	5889.54	4.40	4.42	5885.12	5258.36
26/03/2016 - 25/04/2016	6100.82	6070.32	4.20	4.22	6066.09	5420.06
26/04/2016 - 25/05/2016	5879.58	5850.18	3.90	3.92	5846.26	5223.64
26/05/2016 - 25/06/2016	5281.36	5254.95	3.10	3.12	5251.84	4692.52
26/06/2016- 25/07/2016	5204.56	5178.54	2.90	2.91	5175.62	4624.42
26/07/2016 - 25/08/2016	5613.70	5585.63	4.30	4.32	5581.31	4986.90
26/08/2016 - 25/09/2016	6056.34	6026.06	3.90	3.92	6022.14	5380.78
26/09/2016 - 25/10/2016	6434.94	6402.77	4.80	4.82	6397.94	5716.56
26/10/2016 - 25/11/2016	6302.54	6271.03	3.10	3.12	6267.91	5600.38
26/11/2016 - 31/12/2016	4812.46	4788.40	4.90	4.92	4783.47	4274.03
Total	67879.54	67540.14	49.00	49.24	67490.90	60303.12

2014:

Item	Baseline emissions or baseline net GHG removals by sinks ($t CO_2e$)	Project emissions or actual net GHG removals by sinks ($t CO_2e$)	Leakage ($t CO_2e$)	Emission reductions or net anthropogenic GHG removals by sinks ($t CO_2e$)
Total	46,735	0	0	46,735

2015:

Item	Baseline emissions or baseline net GHG removals by sinks (t CO_2e)	Project emissions or actual net GHG removals by sinks (t CO_2e)	Leakage (t CO_2e)	Emission reductions or net anthropogenic GHG removals by sinks (t CO_2e)
Total	61,156	0	0	61,156

2016:

Item	Baseline emissions or baseline net GHG removals by sinks (t CO_2e)	Project emissions or actual net GHG removals by sinks (t CO_2e)	Leakage (t CO_2e)	Emission reductions or net anthropogenic GHG removals by sinks (t CO_2e)
Total	60,303	0	0	60,303

Total:

Item	Baseline emissions or baseline net GHG removals by sinks (t CO_2e)	Project emissions or actual net GHG removals by sinks (t CO_2e)	Leakage (t CO_2e)	Emission reductions or net anthropogenic GHG removals by sinks (t CO_2e)
Total	168,194	0	0	168,194

E.5. Comparison of actual emission reductions or net anthropogenic GHG removals by sinks with estimates in registered PDD

According to the registered PDD of this project, the annually expected emission reduction of the project from electricity generation is 67,906 tCO2e. This monitoring period covers 01/04/2014-31/12/2016, which is 1,006 days in total. Then the estimated emission reduction from electricity for this monitoring period should be: 67,906/365*1,006= 187,160 tCO2e. The comparison table is given as below.

Period	Values estimated in ex-ante calculation of registered PDD	Actual values achieved during this monitoring period
01/04/2014-31/12/2014	51,162[5]	46,735
01/01/2015-31/12/2015	67,906	61,156
01/01/2016-31/12/2016	68,092[6]	60,303

[5] 51,162=67906*275 days/365 days
[6] 68,092=67,907*366 days/ 365 days

Total emission reductions of this monitoring period (t CO2e)	187,160	168,194

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

The actual emission reduction amount of the present monitoring period is 168,194 t, below the registered PDD's estimation amount (10.13% lower, as shown below).

Emission Reduction Comparison Calculation:

The difference between estimated and actual emission reductions =187,160 -168,194 = 18,966 tCO2e (The ER amount of the present monitoring period is less from the registered PDD amount)

The percentage= 18,966 / 187,160 = 10.13%

For this whole monitoring period, the result is summarized as below:

Period	Difference (Actual value minus ex-ante value)	Percentage	Note
From 2014-04-01 to 2016-12-31 (tCO_2e)	-18,966	-10.13%	Actual operation under performs compared to the design, due to low waste heat supply.

SECTION F. Sustainable Indicators

1. Air Quality during construction period

Parameter	Target for parameter	Frequency / When	Monitored value
Dust during construction	Dust during construction (dust shall not disturb neighbourhood)	Construciton period	Mitigation measures of spraying water etc. were implemented and dust did not disturb the life of local villagers.

Source: Shahe Environmental Protection Monitoring Center

The dust did not disturb the neighborhood during construction period. Please refer to Annex I for certificates.

2. Air Quality during operating period

Parameter	Target for parameter (mg/m3)	Frequency / When	Monitored value (mg/m3)
Dust concentration in flue gas	100	annually	lower than 100
SO2 concentration in flue gas	600		lower than 600

Source: Shahe Environmental Protection Monitoring Center

Based on the national standard of "Emission standard of air pollutants for flat glass industry" (GB26453-2011)[7], the emission concentration of dust and SO_2 during the monitoring period is below 100 mg/m^3 and 600 mg/m^3. Please refer to Annex II for certificates of year 2014, 2015 and 2016. As per sustainability monitoring plan, the monitoring frequency for air quality during operating period is annual. During this monitoring period, according to the measurement results for air quality issued in 2014, 2015 and 2016 by Shahe Environmental Protection Monitoring Center, the monitoring frequency is in accordance with the monitoring plan, and the monitoring validity period covers the whole monitoring period as the latest monitoring conducted in December 2016 has been still in valid until now.

[7] Originally in the registered GS Passport, the national standard here referred to GB9078-1996. But this standard was already replaced with GB26453-2011 since October 2011. http://wenku.baidu.com/link?url=cLidMfVRIu-Qg4yn3k00bBs2LZ6666pzr_C4R66DE9nDdTmUy01K2T0RZP5gvUwMPKjwE-MzisqYOu_y19EQ5C1RfbgsqLoS6hXgUzlGpwS

3. Quality of employment

Parameter	Target for parameter	Frequency / When	Monitored value
Number of full time jobs	24		24
Workplace air quality	The workplace air quality follows national standard	annually	No benzene, sulfur trioxide, hydrogen-fluoride or other harmful gases are generated by the project. The workshop has good ventilation.
Fire protection	The fire protection equipments are in place; the employees recieve fire protection training.		The fire potection system was checked and approved by local fire protection bureau. The employees took fire protection training and exams

Source:HR records; Shahe Environmental Protection Monitoring Center ; Local fire protection bureau certificate and training records

The project has created 24 job positions. The work place follows the national standard and fire protection measures are in place. Please refer to Annex III for HR records, workplace air quality and fire protection certificates and training records.
The HR record with the information of employee name, job position, income and gender provided in Annex III is the latest employee list for year 2016, which is attached here as a sample. The employee lists for year 2014 and 2015 have also been provided to DOE during site visit. Therefore, the HR records for year 2014, 2015 and 2016 cover the whole monitoring period.
For monitoring workplace air quality, as per sustainability monitoring plan, the monitoring frequency of safe and healthy work environment for workers of the whole plant is annual. During this monitoring period, according to the measurement results for workplace air quality issued in 2014, 2015 and 2016 by Shahe Environmental Protection Monitoring Center, the monitoring frequency is in accordance with the monitoring plan, and the monitoring validity period covers the whole monitoring period.

The fire protection certificate provided in Annex III is actually the fire protection system approval issued by Shahe Fire Protection Bureau after the completion of the project activity's construction, which has illustrated that the fire protection system of the project activity has been qualified and approved by the local fire protection official. This kind of approval is always issued once a new project completing construction and passing the materials review and onsite inspection, while it is certainly not conducted annually by local authority. As per the statement of this approval, if the project involves reconstruction, extension, internal renovation and change of use, the project should apply to the local fire protection authority for fire protection inspection and acceptance again. For this project activity, no reconstruction, extension, internal renovation and change of use is involved, so no fire protection certificate or the fire protection system approval needs to be applied annually for the project activity. In fact, annually the project owner itself is responsible for inspection and maintenance of the fire protection system and provides fire protection training to employees during project's operation. Relevant inspection, maintenance and training records of fire protection system are all well reserved.

4. Human and institutional capacity

Parameter	Target for parameter	Frequency / When	Monitored value
Female employment	≥ 1	annually	3

Source: HR records; training records

The project has created 3 female employment positions. Please refer to Annex III for HR records and training records.

5. Quantitative employment and income generation

Parameter	Target for parameter	Frequency / When	Monitored value
Number of jobs and income satisfaction rate	Number of jobs: 24 positions; The employees are satisfied with the income.	annually	24 job positions are created. The income level of the employees are satisfying

Source: HR income records; interview records

The project has created 24 job positions. The income level is satisfying. Please refer to Annex III for HR records.

6. Noise

Parameter	Target for parameter	Frequency / When	Monitored value
Implementation of noise reduction equipment for generators and protection measures for personnel	N/A	annually	Equipments are covered by noise reduction shield and personnel has separate operation room with protection measures

Source: interview and equipment check records; noise certificate

Noise reduction equipment for generators and protection measures for personnel have been implemented. Based on the national standard of "Emission standard for industrial enterprises noise at boundary" (GB12348-2008)[8], the noise level during this monitoring period is below 60 dB(A) during daytime and below 50 dB(A) during night. Please refer to Annex IV for noise certificates for year 2014, 2015 and 2016. The monitoring frequency for noise is annual as per sustainability monitoring plan. During this monitoring period, according to the measurement results for noise issued in 2014, 2015 and 2016 by Shahe Environmental Protection Monitoring Center, the monitoring frequency is in accordance with the monitoring plan, and the monitoring validity period covers the whole monitoring period.

7. Water quality

Parameter	Target for parameter	Frequency / When	Monitored value
Wastewater treatment	Circulating cooling water, boiler blow down water and municipal wastewater properly treated, as per national standards	annually	The wastewater treatment meets national standard GB8978-1996

Source:Shahe Environmental Protection Monitoring Center

The wastewater is properly treated and meets national standards. Please refer to Annex V for water quality certificates for year 2014, 2015 and 2016. As per sustainability monitoring plan, the monitoring frequency for water quality is annual. During this monitoring period, according to the measurement results for water quality issued in 2014, 2015 and 2016 by Shahe Environmental Protection Monitoring Center, the monitoring frequency is in accordance with the monitoring plan, and the monitoring validity period covers the whole monitoring period. Please refer to Annex V for the water quality certificates.

8. Air quality of whole glass plant area after the PA

Parameter	Target for parameter (mg/m3)	Frequency / When	Monitored value
Dust concentration in atmosphere	0.15	Once upon the first Verification	lower than 0.15
SO2 concentration in atmosphere	0.3		lower than 0.3

Source:Shahe Environmental Protection Monitoring Center

The concentration of dust and SO_2 in the atmosphere during the 3rd verification monitoring period is below 0.15 mg/m^3 and 0.3 mg/m^3. Please refer to Annex V for the certificates.

9. Safe and healthy work environment for workers of the whole plant

Parameter	Target for parameter	Frequency / When	Monitored value
Plant safety regulation and training and work environment status	The plant safety measures are in place; work environment is healthy	annually	The plant complies with Occupational Health and Safety requirements (GB/T 28001-2011)

Source: Glass plant Occupational Health and Safety Ceritificate

The glass plant provides good working environment to the employees and obtained Occupational Health and Safety certificate. Please refer to Annex VI for QHS certificate.

10. Furnace waste refractory brick disposal

Parameter	Target for parameter	Frequency / When	Monitored value
Furnace waste refractory brick disposal with proper hazardous waste management measures	N/a	annually	The waste refractory brick will be sold to third party and reused. No hazardous waste is produced

Source: waste refratory brick recycle contract

Please refer to Annex VII for disposal contact.

[8] Originally in the registered GS PDD, the national standard here referred to GB12348-1990. But this standard was replaced with GB12348-2008 since October 2008. http://wenku.baidu.com/link?url=Zavvo_R8euo2nMpHCKL5FKT0iuhVseuoV8wR8cmxnV8gwnZZdS9Ri3-3x8-22zz4aysCainroJoktCz3a1XmryddHTTt5vbicvtZ_cK0uLq

Annex I. Air Quality during construction period

沙河市环境保护监测站

监 测 结 果 报 告 书

报告日期 2009 年 06 月 15 日

样品名称 TSP　采样地点 项目现场　采样方法　规　范

监测日期 见 表　采 样 人 李 峰　受检单位 河北迎新玻璃集团有限公司

2×6MW 余热发电项目施工过程中粉尘

检测分析结果：

监测日期	监测项目	监测点位	单位	监测结果	标准值
2009 年 04 月 08 日	TSP	1#	mg/m³	0.124	0.3
		2#	mg/m³	0.117	0.3
		3#	mg/m³	0.132	0.3
		4#	mg/m³	0.121	0.3
		5#	mg/m³	0.116	0.3
		6#	mg/m³	0.114	0.3
2009 年 06 月 12 日	TSP	1#	mg/m³	0.127	0.3
		2#	mg/m³	0.121	0.3
		3#	mg/m³	0.133	0.3
		4#	mg/m³	0.125	0.3
		5#	mg/m³	0.114	0.3
		6#	mg/m³	0.120	0.3

本次监测期间，该企业 2×6MW 余热发电项目施工过程中，对项目现场 6 个样点进行了监测，TSP 日均值排放浓度均符合《环境空气质量标准》（GB3095-1996）中二级标准 。

检验者　审核　（盖章）

Annex II. Air Quality during operating period

Operation period -2014

沙河市环境保护监测站

监测结果报告书

报告日期：2014 年 12 月 15 日

样品名称	废气	采样地点	排气筒	采样方法	规范
监测日期	见表	采样人	李峰	受检单位	河北迎新玻璃集团有限公司余热发电项目

检测分析结果：

监测日期	监测项目	监测结果	标准值
2014 年 03 月 04 日（第一季度）	排气量（Nm^3/h）	51,381	---
	SO_2（mg/m^3）	537	600
	颗粒物（mg/m^3）	88.2	100
2014 年 05 月 23 日（第二季度）	排气量（Nm^3/h）	48,735	---
	SO_2（mg/m^3）	562	600
	颗粒物（mg/m^3）	75.6	100
2014 年 09 月 17 日（第三季度）	排气量（Nm^3/h）	49,967	---
	SO_2（mg/m^3）	514	600
	颗粒物（mg/m^3）	81.3	100
2014 年 12 月 13 日（第四季度）	排气量（Nm^3/h）	50,643	---
	SO_2（mg/m^3）	568	600
	颗粒物（mg/m^3）	86.4	100

本次监测期间，该企业废气排放中各污染因子均符合《平板玻璃工业大气污染物排放标准》（GB26453-2011）表 1 中玻璃熔窑标准限值要求，为达标排放。

检验者 [illegible]　　审核 [illegible]　　监测站（盖章）

Operation period – 2015

沙河市环境保护监测站

监测结果报告书

报告日期：2015 年 12 月 21 日

样品名称	废气	采样地点	排气筒	采样方法	规范
监测日期	见表	采样人	李峰	受检单位	河北迎新玻璃集团有限公司余热发电项目

检测分析结果：

监测日期	监测项目	监测结果	标准值
2015 年 03 月 17 日（第一季度）	排气量（Nm^3/h）	47,982	---
	SO_2（mg/m^3）	548	600
	颗粒物（mg/m^3）	80.5	100
2015 年 06 月 22 日（第二季度）	排气量（Nm^3/h）	48,485	---
	SO_2（mg/m^3）	533	600
	颗粒物（mg/m^3）	74.7	100
2015 年 09 月 08 日（第三季度）	排气量（Nm^3/h）	50,143	---
	SO_2（mg/m^3）	553	600
	颗粒物（mg/m^3）	86.6	100
2015 年 12 月 17 日（第四季度）	排气量（Nm^3/h）	51,529	---
	SO_2（mg/m^3）	553	600
	颗粒物（mg/m^3）	84.4	100

本次监测期间，该企业废气排放中各污染因子均符合《平板玻璃工业大气污染物排放标准》（GB26453-2011）表 1 中玻璃熔窑标准限值要求，为达标排放。

检验者 [signature]　　审 核 [signature]　　监测站（盖章）

Operation period – 2016

沙河市环境保护监测站

监测结果报告书

报告日期：2016 年 12 月 21 日

样品名称	废气	采样地点	排气筒	采样方法	规范
监测日期	见表	采样人	李峰	受检单位	河北迎新玻璃集团有限公司余热发电项目

检测分析结果：

监测日期	监测项目	监测结果	标准值
2016 年 03 月 14 日（第一季度）	排气量（Nm^3/h）	49,551	---
	SO_2 （mg/m^3）	538	600
	颗粒物（mg/m^3）	81.6	100
2016 年 05 月 10 日（第二季度）	排气量（Nm^3/h）	47,756	---
	SO_2 （mg/m^3）	529	600
	颗粒物（mg/m^3）	78.2	100
2016 年 09 月 06 日（第三季度）	排气量（Nm^3/h）	51,590	---
	SO_2 （mg/m^3）	546	600
	颗粒物（mg/m^3）	74.1	100
2016 年 12 月 19 日（第四季度）	排气量（Nm^3/h）	50,823	---
	SO_2 （mg/m^3）	514	600
	颗粒物（mg/m^3）	65.3	100

本次监测期间，该企业废气排放中各污染因子均符合《平板玻璃工业大气污染物排放标准》（GB26453-2011）表 1 中玻璃熔窑标准限值要求，为达标排放。

检验者 审核 （盖章）

Annual HR records during this monitoring period – Name, Job Position, Income and Gender

河北迎新集团余热电厂工资表

序号	姓 名	职 位	月薪	性 别
1	赵秀军	一值值班长	2500	男
2	张萌萌	电气值班员	2450	女
3	陈志杰	电气值班员	2400	男
4	李 鹏	汽机值班员	2450	男
5	王宇	汽机值班员	2400	男
6	韩日奇	锅炉值班员	2450	男
7	王庆波	锅炉值班员	2400	男
1	张俊平	二值值班长	2500	女
2	刘增超	电气值班员	2450	男
3	张杰	电气值班员	2400	男
4	申雄伟	汽机值班员	2450	男
5	赵子豪	汽机值班员	2400	男
6	刘鹏路	锅炉值班员	2450	男
7	姚建帅	锅炉值班员	2400	男
1	石志廷	三值值班长	2500	男
2	李英辉	电气值班员	2450	女
3	赵亚伦	电气值班员	2400	男
4	贺晓光	汽机值班员	2450	男
5	刘博涛	汽机值班员	2400	男
6	韩童童	锅炉值班员	2450	男
7	杨秘宁	锅炉值班员	2400	男
1	李占青	机电维修工	2500	男
2	靳雄涛	机电维修工	2500	男
3	贾霄星	机电维修工	2500	男

Workplace air quality certificate – 2014

沙河市环境保护监测站

监测结果报告书

报告日期：2014 年 11 月 21 日

样品名称	见表	采样地点	余热发电室内	采样方法	规范
监测日期	2014/11/19	采样人	刘伟	受检单位	河北迎新玻璃集团有限公司余热发电项目室内环境空气监测

检测分析结果：

监测日期	监测项目	监测点位	单位	监测结果
2014 年 11 月 19 日	苯	1#东	mg/m³	未检出
		2#南	mg/m³	未检出
		3#西	mg/m³	未检出
		4#北	mg/m³	未检出
	硫酸雾	1#东	mg/m³	未检出
		2#南	mg/m³	未检出
		3#西	mg/m³	未检出
		4#北	mg/m³	未检出
	氟化氢	1#东	mg/m³	未检出
		2#南	mg/m³	未检出
		3#西	mg/m³	未检出
		4#北	mg/m³	未检出

本次监测期间，该企业 2×6MW 余热发电项目室内空气浓度均未检出。生产过程中不涉及有毒有害气体，发电车间通风正常，员工作业室配有暖气空调，工作环境舒适。

检验者 审核 监测站（盖章）

Workplace air quality certificate -2015

沙河市环境保护监测站

监测结果报告书

报告日期：2015 年 10 月 14 日

样品名称	见表	采样地点	余热发电室内	采样方法	规范
监测日期	2015/10/12	采样人	刘伟	受检单位	河北迎新玻璃集团有限公司余热发电项目室内环境空气监测

检测分析结果：

监测日期	监测项目	监测点位	单位	监测结果
2015 年 10 月 12 日	苯	1#东	mg/m³	未检出
		2#南	mg/m³	未检出
		3#西	mg/m³	未检出
		4#北	mg/m³	未检出
	硫酸雾	1#东	mg/m³	未检出
		2#南	mg/m³	未检出
		3#西	mg/m³	未检出
		4#北	mg/m³	未检出
	氟化氢	1#东	mg/m³	未检出
		2#南	mg/m³	未检出
		3#西	mg/m³	未检出
		4#北	mg/m³	未检出

本次监测期间，该企业 2×6MW 余热发电项目室内空气浓度均未检出，生产过程中不涉及有毒有害气体，发电车间通风正常，员工作业室配有暖气空调，工作环境舒适。

检验者 审核 监测单位（盖章）

Workplace air quality certificate – 2016

沙河市环境保护监测站

监测结果报告书

报告日期：2016 年 12 月 08 日

样品名称	见表	采样地点	余热发电室内	采样方法	规范
监测日期	2016/12/06	采样人	刘伟	受检单位	河北迎新玻璃集团有限公司余热发电项目室内环境空气监测

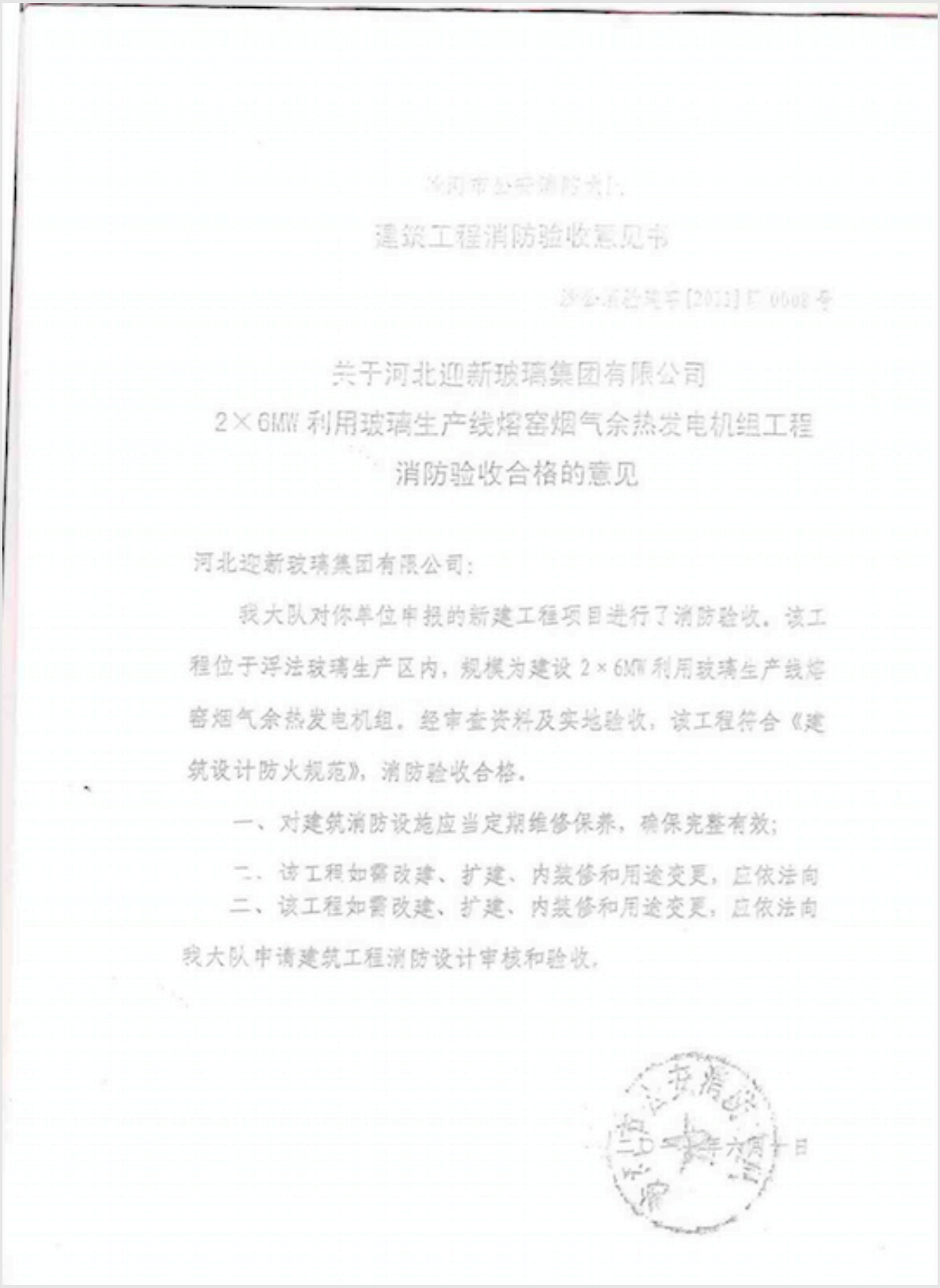
检测分析结果：

监测日期	监测项目	监测点位	单位	监测结果
2016 年 12 月 06 日	苯	1#东	mg/m³	未检出
		2#南	mg/m³	未检出
		3#西	mg/m³	未检出
		4#北	mg/m³	未检出
	硫酸雾	1#东	mg/m³	未检出
		2#南	mg/m³	未检出
		3#西	mg/m³	未检出
		4#北	mg/m³	未检出
	氟化氢	1#东	mg/m³	未检出
		2#南	mg/m³	未检出
		3#西	mg/m³	未检出
		4#北	mg/m³	未检出

本次监测期间，该企业 2×6MW 余热发电项目室内空气浓度均未检出，生产过程中不涉及有毒有害气体，发电车间通风正常，员工作业室配有暖气空调，工作环境舒适。

检验者 审核 室测站（盖章）

Fire protection system approval by Shahe Fire Protection Bureau



沧州市公安消防支队：

建筑工程消防验收意见书

沧公消验字[2012]第0008号

关于河北迎新玻璃集团有限公司
2×6MW利用玻璃生产线熔窑烟气余热发电机组工程
消防验收合格的意见

河北迎新玻璃集团有限公司：

我大队对你单位申报的新建工程项目进行了消防验收，该工程位于浮法玻璃生产区内，规模为建设2×6MW利用玻璃生产线熔窑烟气余热发电机组，经审查资料及实地验收，该工程符合《建筑设计防火规范》，消防验收合格。

一、对建筑消防设施应当定期维修保养，确保完整有效；

二、该工程如需改建、扩建、内装修和用途变更，应依法向

二、该工程如需改建、扩建、内装修和用途变更，应依法向

我大队申请建筑工程消防设计审核和验收。

二〇一二年六月十日

Project employees' safety training records (female employees joined as well)

2014:

河北迎新玻璃集团有限公司　　记录表格

培训记录

编号：JL-6.2-01　　单位：全空

时间：2014年元月9日	培训题目：汽轮机油有关知识	培训教师：陈保岐
地点：中控室		培训方式：讲授

参加培训人员名单（共 6 人）：

王宇 李鹏 申雄伟 赵子豪 贺晓光 刘博涛

培训内容摘要：

我厂汽轮机油型号为L-TSA46，要求闪点不低于180℃。

闪点，是在规定的试验条件下，液体表面上发生闪燃的最低温度。闪点是防止油发生火灾的一项重要指标。

汽轮机油使用注意事项：1.尽可能防止机组漏汽、漏水。2.回油温度控制在65℃以下。3.油箱定期放水、滤油。

考核方式及成绩：

考核合格率：

编制：　　审核：　　批准：　　日期：

2015:

河北迎新玻璃集团有限公司　　　　记录表格

培训记录

编号：JL-6.2-01　　　　单位：余热电厂

时间：2015.9	培训题目： "一清、二有、三查、四认真"是什么	培训教师：赵庆军
地点：主控室		培训方式：讲授

参加培训人员名单（共 2 人）：

王宇　李鹏

培训内容摘要：

在操作过程中，应做到"一清、二有、三查、四认真"：

一清：运行方式与系统连接清；

二有：有故障预想；有模拟图预演；

三查：查操作人对操作任务是否明确；查操作项目是否正确；查安全用具是否齐全；

四认真：认真监护，认真唱票，认真复诵，认真核对操作设备的编号和位置。

考核方式及成绩：

考核合格率：

编制：　　审核：　　批准：　　日期：

2016:

河北迎新玻璃集团有限公司 记录表格

培训记录

编号:JL-6.2-01 单位:

时间:216.12	培训题目:锅炉本体的检查	培训教师:石志强
地点:主控室		培训方式:讲解
参加培训人员名单（共 2 人）：章和童童. 杨秋宁.		
培训内容摘要: ①烟道进出口电动蝶阀位置正常. ②定期排污及疏水阀门正常.无泄漏. ③给水平台各管道及阀门正常、无泄漏. ④各炉门、炉墙、烟风系统无漏风现象. ⑤各联箱 汽水管道无泄漏、吹灰装置无泄漏. ⑥锅炉各就地仪表与DCS对照一致. ⑦除渣器排渣门开度适中. ⑧锅炉本体保温正常.无脱落.		
考核方式及成绩:		
考核合格率:		
编制: 审核: 批准: 日期:		

Annex IV. Noise

Operation period – 2014

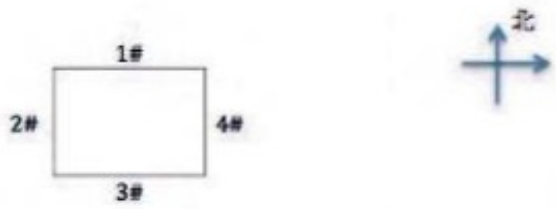
沙河市环境保护监测站

监测结果报告书

报告日期：2014 年 08 月 13 日

样品名称	噪声	采样地点	厂界	采样方法	瞬流
采样日期	见表	采样人	李峰	受检单位	河北迎新玻璃集团有限公司余热发电项目室内环境空气监测

检测分析结果：



监测日期	类别	1#北厂界	2#西厂界	3#南厂界	4#东厂界	标准
2014.08.11	昼间	52.1	56.8	54.3	55.3	60
	夜间	43.2	45.6	42.9	45.1	50
2014.08.12	昼间	52.3	56.4	54.7	55.9	60
	夜间	43.1	45.1	42.6	45.3	50

本次监测期间，该企业噪声排放符合《工业企业厂界环境噪声排放标准》（GB12348-2008）中表一 2 级标准要求，为达标排放。

检验者 审核 监测站

Operation period – 2015

沙河市环境保护监测站

监测结果报告书

报告日期：2015 年 09 月 16 日

样品名称	噪声	采样地点	厂界	采样方法	瞬态
采样日期	见表	采样人	李峰	受检单位	河北旭新玻璃集团有限公司余热发电项目室内环境空气监测

检测分析结果：

监测日期	类别	1#北厂界	2#西厂界	3#南厂界	4#东厂界	标准
2015.09.14	昼间	53.7	55.2	56.5	52.9	60
	夜间	46.0	45.2	43.0	47.5	50
2015.09.15	昼间	53.1	55.2	56.0	52.8	60
	夜间	45.9	44.8	42.6	46.3	50

本次监测期间，该企业噪声排放符合《工业企业厂界环境噪声排放标准》（GB12348-2008）中表一 2 级标准要求，为达标排放。

检验者 审核

Operation period – 2016

沙河市环境保护监测站

监测结果报告书

报告日期：2016 年 10 月 21 日

样品名称	噪声	采样地点	厂界	采样方法	规范
采样日期	见表	采样人	李峰	受检单位	河北迎新玻璃集团有限公司余热发电项目室内环境空气监测

检测分析结果：

监测日期	类别	1#北厂界	2#西厂界	3#南厂界	4#东厂界	标准
2016.10.18	昼间	55.5	56.2	57.1	53.4	60
	夜间	44.2	46.7	45.8	46.2	50
2016.10.19	昼间	55.1	56.7	56.4	52.9	60
	夜间	44.6	46.3	45.1	45.9	50

本次监测期间，该企业噪声排放符合《工业企业厂界环境噪声排放标准》（GB12348-2008）中表一 2 级标准要求，为达标排放。

检验者 审核 监测站（盖章）

Annex V. Water quality

Operation period – 2014

沙河市环境保护监测站

监测结果报告书

报告日期：2014 年 11 月 27 日

样品名称	废水、废气	采样地点	总排污口、厂界	采样方法	规范
监测日期	见表	采样人	淮雪坡	受检单位	河北迎新玻璃集团有限公司

检测分析结果：

总排污口废水监测结果

监测日期	监测项目	监测值		标准值
		第一次	第二次	
2014 年 11 月 25 日	pH(无量纲)	7.25	7.21	6-9
	COD_{cr} (mg/L)	65.6	66.3	150
	悬浮物(mg/L)	54.3	51.7	150
	氨氮(mg/L)	16.9	16.0	25

无组织排放废气监测结果

监测日期	监测项目	监测值				标准值
		东厂界	西厂界	南厂界	北厂界	
2014 年 11 月 25 日	SO_2 (mg/m³)	0.136	0.132	0.130	0.135	0.5
	颗粒物(mg/m³)	0.290	0.284	0.282	0.289	1.0

本次监测期间，该企业经化粪池和沉淀池处理后的废水排放各项污染物均符合《污水综合排放标准》（GB8978-1996）二级标准限值要求，为达标排放。无组织颗粒物和 SO_2 排放均符合《大气污染物综合排放标准》（GB16297-1996）表 2 无组织排放监控浓度限值的要求，为达标排放。

检验者 [illegible]　　审核 [illegible]　　监测站（盖章）

Operation period – 2015

沙河市环境保护监测站

监测结果报告书

报告日期：2015 年 10 月 23 日

样品名称	废水、废气	采样地点	总排污口、厂界	采样方法	规范
监测日期	见表	采样人	淮雪坡	受检单位	河北迎新玻璃集团有限公司

检测分析结果：

总排污口废水监测结果

监测日期	监测项目	监测值		标准值
		第一次	第二次	
2015 年 10 月 21 日	pH(无量纲)	7.10	7.35	6-9
	COD_{cr} (mg/L)	60.9	65.1	150
	悬浮物(mg/L)	55.8	59.2	150
	氨氮(mg/L)	17.2	16.6	25

无组织排放废气监测结果

监测日期	监测项目	监测值				标准值
		东厂界	西厂界	南厂界	北厂界	
2015 年 10 月 21 日	SO_2 (mg/m³)	0.137	0.131	0.132	0.137	0.5
	颗粒物(mg/m³)	0.280	0.286	0.288	0.285	1.0

本次监测期间，该企业经化粪池和沉淀池处理后的废水排放各项污染物均符合《污水综合排放标准》（GB8978-1996）二级标准限值要求，为达标排放。无组织颗粒物和 SO_2 排放均符合《大气污染物综合排放标准》（GB16297-1996）表 2 无组织排放监控浓度限值的要求，为达标排放。

检验者 [illegible]　　审核 [illegible]　　监测站（盖章）

Operation period – 2016

沙河市环境保护监测站

监测结果报告书

报告日期：2016 年 9 月 16 日

样品名称	废水、废气	采样地点	总排污口、厂界	采样方法	规范
监测日期	见表	采样人	淮雪坡	受检单位	河北迎新玻璃集团有限公司

检测分析结果：

总排污口废水监测结果

监测日期	监测项目	监测值		标准值
		第一次	第二次	
2016 年 9 月 13 日	pH(无量纲)	7.25	7.41	6-9
	COD_{cr} (mg/L)	68.4	64.6	150
	悬浮物(mg/L)	56.1	51.6	150
	氨氮(mg/L)	18.9	15.3	25

无组织排放废气监测结果

监测日期	监测项目	监测值				标准值
		东厂界	西厂界	南厂界	北厂界	
2016 年 9 月 13 日	SO_2 (mg/m³)	0.132	0.136	0.139	0.135	0.5
	颗粒物(mg/m³)	0.288	0.276	0.272	0.287	1.0

本次监测期间，该企业经化粪池和沉淀池处理后的废水排放各项污染物均符合《污水综合排放标准》（GB8978-1996）二级标准限值要求，为达标排放。无组织颗粒物和 SO_2 排放均符合《大气污染物综合排放标准》（GB16297-1996）表 2 无组织排放监控浓度限值的要求，为达标排放。

检验者 [illegible]　　审 核 [illegible]　　监测站（盖章）

Annex VI. Safe and healthy work environment for workers of the whole plant

Occupational Health and Safety certificate

CERTIFICATE

职业健康安全管理体系
认 证 证 书

证书编号：00215S11393R1L

兹证明

河北迎新玻璃集团有限公司
河北迎新集团矸石热电有限公司

组织机构代码：71586267-5; 76205735-3
住所：河北省沙河市迎新大街东段
住所：河北省沙河市东环路中段
认证地址：河北省沙河市迎新大街东段(054100)
认证地址：河北省沙河市东环路中段（054100）

管理体系符合

GB/T 28001-2011/OHSAS 18001:2007
《职业健康安全管理体系 要求》

覆盖的产品及其过程

平板玻璃及低辐射镀膜玻璃的生产、热力的生产
覆盖的分场所及认证范围见附件

生效日期：2015 年 08 月 10 日　　有效期至：2018 年 08 月 09 日

注册号：CQM-99-2008-0125-0003

（本证书信息可在国家认证认可监督管理委员会官方网站 www.cnca.gov.cn 或方圆标志认证集团官方网站上查询，也可通过验证《确认证书》确认本证书的有效性）

方圆标志认证集团有限公司

二零一五年八月十日

GB/T 28001

CNAS 中国认可 管理体系 MANAGEMENT SYSTEM CNAS C002-M

方圆标志认证集团

地址：北京市海淀区增光路33号（100048）

http://www.cqm.com.cn

CQM 方圆认证 CERTIFICATION

CERTIFICATE

环境管理体系认证证书

证书编号：CQM15E21850R1L

兹证明

河北迎新玻璃集团有限公司
河北迎新集团矸石热电有限公司

组织机构代码：71586267-5; 76205735-3
住所：河北省沙河市迎新大街东段
住所：河北省沙河市东环路中段
认证地址：河北省沙河市迎新大街东段(054100)
认证地址：河北省沙河市东环路中段（054100）

管理体系符合

GB/T 24001-2004/ISO 14001:2004
《环境管理体系 要求及使用指南》

覆盖的产品及其过程

平板玻璃及低辐射镀膜玻璃的生产、热力的生产

覆盖的分场所及认证范围见附件

生效日期：2015 年 08 月 10 日　　有效期至：2018 年 08 月 09 日
注册号：CQM-99-2008-0125-0002

(本证书信息可在国家认证认可监督管理委员会官方网站 www.cnca.gov.cn 或方圆标志认证集团官方网站上查询，也可通过验证《确认证书》确认本证书的有效性)

CQM 国际认证联盟成员 IQNet

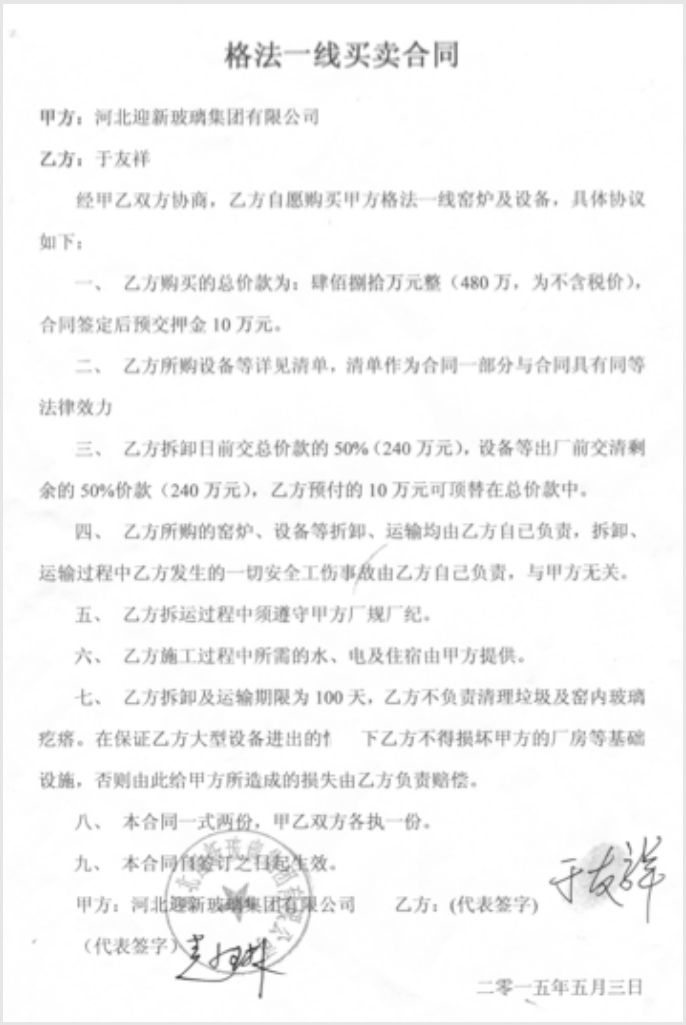
方圆标志认证集团有限公司

二零一五年八月十日

方圆标志认证集团
地址：北京市海淀区增光路33号 (100048)
http://www.cqm.com.cn

Annex VII. Furnace waste refractory brick disposal

Waste refractory brick disposal contract



格法一线买卖合同

甲方：河北迎新玻璃集团有限公司

乙方：于友祥

经甲乙双方协商，乙方自愿购买甲方格法一线窑炉及设备，具体协议如下：

一、 乙方购买的总价款为：肆佰捌拾万元整（480 万，为不含税价），合同签定后预交押金 10 万元。

二、 乙方所购设备等详见清单，清单作为合同一部分与合同具有同等法律效力

三、 乙方拆卸日前交总价款的 50%（240 万元），设备等出厂前交清剩余的 50%价款（240 万元），乙方预付的 10 万元可顶替在总价款中。

四、 乙方所购的窑炉、设备等拆卸、运输均由乙方自己负责，拆卸、运输过程中乙方发生的一切安全工伤事故由乙方自己负责，与甲方无关。

五、 乙方拆运过程中须遵守甲方厂规厂纪。

六、 乙方施工过程中所需的水、电及住宿由甲方提供。

七、 乙方拆卸及运输期限为 100 天，乙方不负责清理垃圾及窑内玻璃疙瘩。在保证乙方大型设备进出的情 下乙方不得损坏甲方的厂房等基础设施，否则由此给甲方所造成的损失由乙方负责赔偿。

八、 本合同一式两份，甲乙双方各执一份。

九、 本合同自签订之日起生效。

甲方：河北迎新玻璃集团有限公司　　乙方：(代表签字)

（代表签字）

二零一五年五月三日

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