APPROVED

General Director

Pavel Boyko

MONITORING REPORT

HFC-23 destruction at JSC Halogen, Perm

JI registration reference N: 0115

Version 2.1

24 June 2011

Monitoring period: 01.01.2011 - 31.03.2011

Valeriy Andreychatenko, Chief Engineer

Andrey Birt, Head of Technical Department

Project operator: HaloPolymer Perm JSC

REFERENCE

SECTION A. PROJECT AND MONITORING INFORMATION

A.1. Project title and reference

The project title: HFC-23 destruction at JSC Halogen, Perm

The sectoral scope: 11 Fugitive emissions from production and consumption of HFCs

JI registration number: 0115

PDD reference: Version 2.0, Date 02 February 2009

PDD Verification: issued by Det Norske Veritas on the 11 February 2010

A.2. Monitoring period

1st Verification (monitoring period 01.01.2008 - 31.12.2008):issued by Bureau VeritasSertificationRus

2nd Verification (monitoring period 01.01.2009 - 31.12.2009): issued by Bureau VeritasSertificationRus

3rd Verification (monitoring period 01.01.2010 - 31.12.2010): in progress

4th Verification (monitoring period 01.01.2011 - 31.12.2011):in progress

5th Verification (monitoring period 01.01.2012 - 31.12.2012): expected 01 February 2013

A.3. Project description

The project is implemented at JSC Halogen, Perm, Perm Krai, Russia. The plant produces fluorine-containing products: fluoroplastics, fluoropolymers, and various goods manufactured from them, hydrogen fluoride, halocarbons R14 (CF4), R22 (HCFC22), R125 (C2F5H), R318 (C4F8), chemical agents, and hydrofluoric acids. HCFC22 production line was put into operation in 1950s. Project annual capacity of HCFC22 production is 17 100 ton/year (2.4 ton/hour).

HFC23 is a by-product of HCFC22 manufacturing. The main source of HFC23 emissions is the HCFC22 rectification column. Other HFC23 containing waste flows are blow-offs from monomer-4 production and R-125 production, but these flows are not considered part of the project activity because they contain hazardous substances and therefore must be destroyed according to Russian legislation.

The project consists in the reconstruction, modernization and the effective destruction capacity enhancement of the existing FOC thermal destruction installation consisting of 3 destruction units by reducing maintenance downtime thereby increasing the number of hours which the units can run in any given year. This enables the enterprise to destroy the entire amount of HFC23 which is produced.

The baseline scenario is the continuation of the existence practice under which the HFC23 wastes were generally released to the atmosphere and would be inevitably released to the atmosphere.

The project scenario envisages a total destruction of HFC23 wastes from sources within the project boundary in the comparison of the baseline scenario under which the HFC23 wastes would be released to the atmosphere.

A.4. Project methodology

Baseline methodology: The baseline is developed in accordance with the JI Guidelines (Criteria for baseline setting and monitoring) and the Guidance on criteria for baseline setting and monitoring (version 01) and based on the approved CDM methodology AM0001: Incineration of HFC23 waste streams (version 05.2).

Monitoring methodology: The monitoring plan is developed in accordance with the JI Guidelines (Criteria for baseline setting and monitoring) and the Guidance on criteria for baseline setting and monitoring (version 01) and based on the approved CDM methodology AM0001: Incineration of HFC23 waste streams (version 05.2).

The monitoring plan is revised in accordance with paragraph 40 of the Guidance on criteria for baseline setting and monitoring (version 02). See Appendix 1 for Revised Monitoring Plan. Intended deviations to the registered monitoring plan are described and justified in Appendix 2.

A.5. Project implementation

The project consists in the reconstruction, modernization and the effective destruction capacity enhancement of the existing FOC thermal destruction installation consisting of 3 destruction units by reducing maintenance downtime thereby increasing the number of hours which the units can run in any given year. This enables the enterprise to destroy the entire amount of HFC23 which is produced.

Furnace modernization, installation of new pipe work, vessel, auxiliary equipment, and instrumentation and controls, as well as testing was completed in December 2007. The destruction process has been started from 01.01.2008.

A.6. Project participants

Project operator and investor: Halogen JSC

Russian Federation, 614113 Perm, Lasvinskaya str., 98

March 9, 2011 the extraordinary general meeting of shareholders "Halogen" decided to change the brand name of a legal entity and the approval of the charter in the new edition. March 17, 2011 to the Unified State Register of Legal Entities entry was made to change the brand name of "Halogen" on "Halopolymer Perm "and re-charter in the new edition. Changing the name is not a reorganization, not alter the rights and responsibilities of the entity. Occurring in the text of the Report of the name of the investor "Halogen" and "Halopolymer Perm" are considered equal.

A.7. Emissions reductions

The expected and generated emission reductions are shown in table below:

Number of monitoring period	Length of the monitoring period	Expected emission reductions	Generated emission reductions
1st monitoring period	01.01.08 - 31.12.08	529 024	511 153
2nd monitoring period	01.01.09 - 31.12.09	528 951	518 871
3rd monitoring period	01.01.10 - 31.12.10	528 907	4 260 629
4th monitoring period	01.01.11 - 31.12.11	528 864	1 108 110
5th monitoring period	01.01.12 - 31.12.12	528 868	n/a
Total	01.01.08 - 31.12.12	2 644 614	n/a

A.8. Contact information

Project operator:

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PavelBoyko, General director
Tel.:+7 342 250 61 52, info@halogen.ru
Tel.: +7 342 250 61 52, www.halogen.ru

Holding company:

Halopolymer, Russian Federation, 123056 Moscow, B. Gruzinskaya str., 38, "1" campus
Igor Kuznetsov, Project director
Tel: +7 495 725 4400, i.kuznetsov@halopolymer.com
Tel: +7 495 725 4400, www.halopolymer.ru

SECTION B. MONITORING ACTIVITIES

B.1. Monitoring process

The monitoring process is executed according to the Organization standard 47-40-2010. The key elements of monitoring process are described below:

1. Measurement of HFC23 waste generated and supplied for destruction

Variables: q_HFC23_y, $q\_G\_HFC23_y$

- $q\_G\_HFC23_y$ is the HFC23 waste generated during the year y, kg
- q_HFC23_y is the HFC23 waste supplied for destruction during the year y, kg

The measurement of HFC23 waste generated and supplied for destruction are performed based on the stationary mass flow meters incorporated in the Automated Process Control System (APCS). APCS provides automated processing, storage, registration and archiving of technological process data with functionality of data protection and security. The consistency of data is provided by means of software.

The measurement of HFC23 waste generated is made by stationary mass flow meter installed on the outlet pipeline from emission source. The readings are automatically collected, stored and processed by APCS.

The measurement of HFC23 waste supplied for destruction is made by two down-in-line stationary mass flow meters installed on the inlet pipelines to the destruction unit. The readings are automatically collected, stored and processed by APCS. The APCS automatically calculates the conservative value of the HFC23 waste supplied for destruction based on the readings from two down-in-line mass flow meters.

The daily reports are automatically generated by APCS software and stored on the workstations (2 mirror hard drives), printed from workstations and copied to storage server every day. Reports include hourly readings of mass flow meters and conservative calculation of the HFC23 waste supplied for destruction based on readings from two down-in-line mass flow meters.

The daily reports are stored on the workstation during 30 days and on the storage server during 10 years. The stored data is additionally archived to CD/DVD and stored during 10 years. The monthly printed reports are archived during 10 years.

2. Calculation of volume of effluent gases emitted from destruction

Variables: q_ND_y

- q_ND_y is the volume of gaseous emissions from destruction process during the year y, m3

The measurement of effluent gases from the destruction unit is made by analytical method. For that purpose the speed of effluent gas is measured weekly by portable flow meter. The measurements are documented and summary reports are archived during 10 years. The measurements are used for calculation of effluent gases volume (average effluent gas speed for a period is multiplied by area of the venting pipe and length of period).

3. Calculation of HFC23 mass content in HFC23 waste generated and supplied for destruction Variables:

C_HFC23_y, $C\_G\_HFC23_y$

- $C\_G\_HFC23_y$ is the average annual content of HFC23 in HFC23 waste generated during the year y, %
- C_HFC23_y is the average annual content of HFC23 in HFC23 waste supplied for destruction during the year y, %

The calculations of HFC23 mass content are performed by laboratory weekly based on the gas samples from outlet pipelines from emission sources and inlet pipelines to the destruction unit. Gas samples are analyzed to measure concentrations of gas components by chromatographs (Chromas GX-1000) and on the basis of these measurements to calculate HCFC23 mass content.

HFC23 mass concentration (mg/m3) is calculated based on approved method No. 468-00-2007 as: Xi =

416,7 x Ci x Mi, where

Ci -molar volume content of i component (%)

Mi - molecular mass of i component HFC23 mass content (%) is calculated as: Xv = Xi / SUM

Xi The results of analysis are regularly checked for repeatability and consistency.

The results of analysis are documented and archived, cross-checked with previous results. Background data and results are stored in laboratory. Monthly reports which include results of the weekly analysis are archived during 10 years.

4. Measurement of HFC23 concentration in effluent gases from the destruction unit

Variables: $C\_ND\_HFC23_y$

- $C\_ND\_HFC23_y$ is the average annual concentration of HFC23 in gas effluents during the year y, mg/m3

The measurement of HFC23 concentration in effluent gases are performed by laboratory weekly based on the gas samples from the venting pipe after destruction unit. Gas samples are analyzed based on approved methods, measurements are made by chromatographs.

The results of analysis are regularly checked for repeatability and consistency. The results of analysis are documented and archived, cross-checked with previous results. Initial data and results are stored in laboratory. Month and annual reports which include results of the weekly analysis are archived during 10 years and to be used for GHG calculations.

5. Measurement of natural gas consumption

Variables: FC_y

- $FC_y$is the natural gas consumption by HFC23 destruction process during the year y, t

Natural gas consumption is measured by volume flow meter for thermal hydrolysis unit and calculated for HFC23 on the basis of consumption norms for each pollutant.

6. Measurement of HFC23 recovered for sale

Variable: S_HFC23_y

- S_HFC23_y is the HFC23 recovered for sale during the year y, t

The HFC23 quantity recovered for sale (if applicable) is determined as HFC23 gross output (commercial output measured by scales + change in inventory measured by level meter). The readings from level meters are taken at the end of each month and recorded. The readings from scales are recorded during the month. Based on the records the gross output of HFC23 is calculated monthly.

The HFC23 production is included in monthly production reports and passed to production accounting department which cross-checked data with production and accounting reports and prepared a summary report for GHG calculation.

7. Measurement of electricity and steam consumption by HFC23 destruction process

Variable: EC_y, StC_y

- EC_y is the electricity consumption by HFC23 destruction process during the year y, MWh
- StCy is steam consumption by HFC23 destruction process during the year y, GJ

The gross electricity consumption is measured by meters (feeders). The electricity consumption by HFC23 destruction process is calculated as the product of HFC23 quantity supplied to the destruction and the electricity consumption norm calculated and approved by the project operator.

The gross steam consumption is measured by steam meters. The steam consumption due to HFC23 destruction process is calculated as the product of HFC23 quantity supplied to the destruction and the steam consumption norm calculated and approved by the project operator.

The electricity and steam consumption by HFC23 destruction process is included in annual reports which are used for GHG calculation.

8. Initial data treatment

The monthly and annual reports which summarize the monitoring information are collected by project operator for verification and GHG calculation. These reports (or annual summary reports) are to be used to prepare monitoring reports.

B.2. Monitoring equipment

The monitoring equipment comprises mass flow meters, level meters, scales, chromatographs and other equipment. The key equipment is 3 mass flow meters. These flow meters are installed on the outlet pipelines from emission sources (1 flow meter) and on the inlet to the destruction unit (2 parallel meters). The zero check of the parallel flow meters was conducted every week and didn't indicate that the flow meter was not stable. The readings from mass flow meters are automatically processed by APCS.

In compliance with the requirements of the Federal Agency for Technical Control and Metrology all the monitoring equipment is regularly inspected, checked and calibrated (if necessary) during the monitoring period.

B.3. Monitoring data

The data presented in this monitoring report has been collected in line with the monitoring plan. The Appendix 2 summarizes monitored data (calculated in MS Excel from project operator's reports).

1. Measurement of HFC23 waste generated and supplied for destruction

Variables: q_HFC23_y, $q\_G\_HFC23_y$

- $q\_G\_HFC23_y$ is the HFC23 waste generated during the year y, kg
- q_HFC23_y is the HFC23 waste supplied for destruction during the year y, kg

The daily data for calculation of q_HFC23_y, $q\_G\_HFC23_y$, is collected from storage server using APCS by the head of R-125 production and processed in MS Excel by the head of Technical department. The summary results are verified by supervisors by cross-checking with documented reports.

2. Calculation of volume of effluent gases emitted from destruction

Variables: q_ND_y

- q_ND_y is the volume of gaseous emissions from destruction process during the year y, m3

The data for calculation of q_ND_y(flow speed of effluent gas) is provided by laboratory and processed in MS Excel by the head of Technical department. The summary results and calculation are verified by supervisors.

3. Calculation of HFC23 mass contents in HFC23 waste generated and supplied for destruction

Variables: C_HFC23_y, $C\_G\_HFC23_y$

- $C\_G\_HFC23_y$ is the average annual content of HFC23 in HFC23 waste generated during the year y, %
- C_HFC23_y is the average annual content of HFC23 in HFC23 waste supplied for destruction during the year y, %

The data for calculation of C_HFC23_y, $C\_G\_HFC23_y$ (results of analysis) is provided by laboratory and processed in MS Excel by the head of Technical department. The summary results and calculation are verified by supervisors.

4. Measurement of HFC23 concentration in effluent gases from the destruction unit

Variables: $C\_ND\_HFC23_y$

- $C\_ND\_HFC23_y$ is the average annual concentration of HFC23 in gas effluents during the year y, mg/m3

The data for calculation of $C\_ND\_HFC23_y$ (results of analysis) is provided by laboratory and processed in MS Excel by the head of Technical department. The summary results and calculation are verified by supervisors.

5. Measurement of natural gas consumption by HFC23 destruction process

Variables: FC_y

FC_y is the natural gas consumption by HFC23 destruction process during the year y, t

The data for calculation of FC_y is provided by chief Metrology department and processed in MS Excel by the head of Technical department. The summary results and calculation are verified by supervisors.

6. Measurement of HFC23 waste recovered for sale

Variable: S_HFC23_y

- S_HFC23_y is the HFC23 recovered for sale during the year y, t

The data for calculation of S_HFC23_y is provided by production accounting department and processed in MS Excel by the head of Technical department. The summary results and calculation are verified by supervisors.

7. Measurement of electricity and steam consumption by HFC23 destruction process

Variable: EC_y, StC_y

- EC_y is the electricity consumption by HFC23 destruction process during the year y, MWh
- StCy is the steam consumption by HFC23 destruction process during the year y, GJ

The data for calculation of EC_y and StC_y is provided by chief power engineer department and processed in MS Excel by the head of Technical department. The summary results and calculation are verified by supervisors.

8. Predefined data for calculations

Predefined data for calculations are taken from PDD by the head of Technical department (exception - see Appendix 2) and verified by supervisors.

B.4. Environmental control

The environmental impact of the project in the monitoring period was assessed in terms of formation of gaseous, liquid and solid wastes.

The control of emissions of HFC23 and others pollutants in effluent gas from the destruction unit as well as their adherence to emission levels was conducted by Laboratory of environmental protection in accordance with a schedule as: HCl, HF, NO2 - 6 time per year.

The annual emissions estimates were: HF (5 kg), HCl (3 kg), NO2 (3 kg), NO (0,5 kg). The emissions of these pollutants didn't exceed the allowed levels. The dioxins formation in effluent gases was conducted 1 time and showed also satisfactory results.

Due to absorption and neutralization of effluent gases the following liquid wastes were produced: used alkaline solution (149,495 t).

The wastes in solid form were not produced due to the project activity.

B.5. Quality assurance and quality control

Quality assurance and quality control are performed according to the registered PDD.

The quality of electronic calculations and electronic data transfer to the monitoring report is provided by the project owner. The background data is transmitted by the project owner in electronic form. Additionally the scanned copies of monthly reports are submitted. All the calculations are made automatically using MS Excel based on the formulas of monitoring plan. The quality of data inserted in MS Excel, formulas used in MS Excel is checked by audit service of project owner which signs the MS Excel spreadsheets with background data and MR with final calculation.

All data will be stored in archive in electronic and paper form during 10 years, but not less than 2 years after the end of the crediting period or the last issue of ERUs.

B.6. Operational and administrative structure

The operational and management structure comprises Project operator and Holding company:

Project operator, Halogen JSC, operates the project, executes the monitoring plan analyses data and prepares the monitoring reports.

The monitoring procedures and monitoring report are executed by the project operator according to Organization standard 47-40-2010 set forth by the Order of the General director. According to the Order all readings in line with the monitoring plan have to be recorded under established procedures and persons responsible for data collection and storage have been appointed.

Holding company, Halopolymer, supervises the execution and progress of the project.

SECTION C. CALCULATIONS OF GHG REDUCTIONS

C.1. Calculation process

The calculation process includes the following steps:

1. The calculation of key variables
2. Calculation of the project GHG emissions
3. Calculation of the baseline GHG emission
4. Calculation of the GHG leakages
5. Calculation of the GHG emission reductions

The calculation is performed in MS Excel based on the background data provided by the project operator. All the computations are made automatically using predefined formulas from the monitoring plan (see Appendix 1). The computations are shown in Appendix 4.

The key background data for calculation was inserted in MS Excel file as database (daily measurements of mass flow meters). Other background data was inserted manually from the summary reports. All the background data in MS Excel file was verified by project operator on the basis of cross-checking with archived reports and the printed lists with background data from MS Excel file were signed.

C.2. The calculation of key variables

The calculations of key variables were made in MS Excel based on the verified background data.

The values of $q\_G\_HFC23_y$, q_HFC23_y were calculated as sum of daily values of these variables obtained from the database provided by the project operator.

The value of q_ND_y was calculated as the sum of monthly values which are the product of average speed of effluent gases during the month (m3/hour) and the length of the corresponding month (the shutdown time was not excluded from calculation).

The values of $C\_G\_HFC23_y$, C_HFC23_y, $C\_ND\_HFC23_y$ were calculated as the monthly average of average values of mass content or concentration during the month.

The values of P_HCFC22_y, FCy, EC_y, StC_y were calculated as the sum of the monthly values.

The main project metrics were calculated as:

$$G\_HFC23_y = q\_G\_HFC23_y \times 10^{-3} \times C\_G\_HFC23_y \times 10^{-2}$$

$$Q\_HFC23_y = q\_HFC23_y \times 10^{-3} \times C\_HFC23_y \times 10^{-2}$$

$$ND\_HFC23_y = q\_ND_y \times C\_ND\_HFC23_y \times 10^{-9}$$

$$L\_HFC23_y = G\_HFC23_y - Q\_HFC23_y - S\_HFC23_y$$

The monthly results of calculation of key variables are shown in Appendix 3. The annual results of calculation are shown in table below:

HFC23 generated from HCFC22 production		HFC23 supplied for destruction	
q_G_HFC23y, kg	115 488	q_HFC23y, kg	115 267
C_G_HFC23y, %	82,11	C_HFC23y, %	82,20
G_HFC23y, t	94,827	Q_HFC23y, t	94,749

HFC23 leaked before destruction		HFC23 not destructed after destruction	
-	-	q_NDy, m3	10 684 120
-	-	C_ND_HFC23y, mg/m3	1,0000
L_HFC23y, t	0,078	ND_HFC23y, t	0,011

The key variables were used for project, baseline and leakage GHG emissions calculation.

C.3. Calculation of the project GHG emissions

The project GHG emissions were calculated using the following formula:

$E\_DP_y = ND\_HFC23_y \times GWP\_HFC23 + FC_y \times EF_f + Q\_HFC23_y \times EF_h$

where ND_HFC23_y is the quantity of HFC23 not destroyed in the unit during 2011, t;

GWP_HFC23 is the GWP for HFC23. The approved GWP value for HFC23 is 11 700 t CO2O-e/t;

FC_y is the natural gas consumption by HFC23 destruction process during 2011, m3;

EF_f is CO2 emission factor of natural gas combustion. Emission factor for natural gas supplied to JSC Halogen by Gazprom TransgazChaykovskiy, LTD is EF_f= 0,002 t C02e/m3 (20 °C);

Q_HFC23_y is the quantity of HFC23 supplied for destruction into the unit during 2011, t;

EF_h is the emissions factor that determines the amount of CO2 generated per 1 tone of destroyed HFC23. According to CDM methodology AM0001, EF = 0,62857 t CO2-e/t.

The project GHG emissions		
E_DP_y	t CO2-e	306

C.4. Calculation of the baseline GHG emissions

The baseline GHG emissions were calculated using the following formula:

$BE_y = Q\_HFC23_y \times GWP\_HFC23$

The baseline GHG emissions		
BE_y	t CO2-e	1 108 563

C.5. Calculation of the GHG leakages

The GHG leakages were calculated using the following formula:

$L_y = ECy \times EF_{co2\_ridy} \times 10^{-3} + StC_y \times EF_{st}$

EC_y is electricity consumption by HFC23 destruction process during 2011, MWh;

$EF_{co2,grid,y}$ is the C02 emissions factor for grid electricity consumption during 2011, kg CO2/MWh;

StC_y is the steam consumption by HFC23 destruction process during 2011, GJ;

EF_{st} is the C02 emission factor for steam consumption, t C02/GJ. According to PDD: = 0,07 t C02e/GJ.

According to Operational Guidelines for Project Design Documents of Joint Implementation Projects.Volume 1.General guidelines.Version 2.3.Ministry of Economic Affairs of the Netherlands. May 2004.GHG emission factor for grid electricity consumed from electrical grid in Russia varies for different years of the crediting period (2008-2012) as follows:

$EF_{co2,grid,2008}$= 565 kg CO2/MWh, $EF_{co2,grid,2009}$= 557 kg CO2/MWh, $EF_{co2,grid,2010}$= 550 kg CO2/MWh, $EF_{co2,grid,2011}$= 542 kg CO2/MWh, $EF_{co2,grid,2012}$ = 534 kg CO2/MWh.

GHG leakages		
L_y	t CO2-e	147

C.6. Calculation of GHG emission reductions

The GHG emission reductions are calculated using the following formula:

$ER_y = BE_y - E\_DP_y - L_y$

The GHG emission reductions		
ER_y	t CO2-e	1 108 110

SECTION D. NEW REVISIONS TO MONITORING PLANS

In compliance with the paragraph 40 of the "Guidance on criteria for baseline setting and monitoring, Version 02" the project participants are encouraged to improve the monitoring process and its results. Revisions, if any, to the monitoring plan to improve the accuracy and/or applicability of information collected shall be justified by the project participants and shall be submitted for the determination referred to in paragraph 37 of the JI guidelines by the AIE. In this case the AIE shall determine whether the proposed revisions improve accuracy and/or applicability of information collected, compared to the original monitoring plan without changing conformity with the relevant rules and regulations for the establishments of monitoring plans and in case of a positive determination, shall proceed with the determination referred to in paragraph 37 of the JI guidelines.

Apart from revisions that were adopted in previous version of the monitoring plans (please see Appendix 2 for details) the new revisions are introduced in the monitoring plan. They represent elimination of such factors as the cut-off conditions and baseline quantity of HFC23 destroyed, which are, in first case, inapplicable due the absence of accurate and representative information, and, in the second case, are inapplicable due to erroneous use of the maximum permissible emissions as a measure of the state regulation of emissions of such a gas and due to the absence of information that HFC23 was historically destroyed. The detailed information on justification of such revisions and the new revised monitoring plan are provided in the Appendix 1.

Deviations that were made in the monitoring plan in connection with the new revisions are represented below:

Deviation 1	**Registered PDD/Description/Justification**
Table D 1.1.3 Item 9. Volume of HCFC22 produced; Item 10. P_HCFC22y, HCFC22 quantity produced	Not monitored as it is included in P_HCFC22_y
	Correction: The volume of HCFC-22 is not monitored as HCFC-22 production is eliminated from the monitoring plan
	Calculated as HCFC22 gross output on the basis of derived products outputs and HCFC22 consumption factors for their production.
	Correction: HCFC22 quantity produced is not monitored as HCFC-22 production is eliminated from the monitoring plan
	Justification: The quantity of HCFC-22 produced was previously determined subject to the requirement of the cut-off condition. The cut-off condition set the maximum annual HCFC-22 quantity that is eligible for crediting (P_HCFC22,max) that is the lower value between: (a) the actual HCFC-22 production in year y (P_HCFC22); and (b) the maximum historical HCFC-22 production level ($P\_HFCF22_{Hist,max}$) at this plant (in tonnes of HCFC22) during any of the last three years between 2002-2004. According to the new revisions to the monitoring plan presented in detail in Appendix 1 the cut-off conditions are eliminated from the monitoring as the values for determining the maximum annual HCFC-22 quantity in 2002-2004 were incorrect. Therefore the quantity of HCFC-22 produced is unnecessary to determine in the monitoring of emission reduction of this project as well.
Deviation 2	**Registered PDD/Deviation/Justification**
Subsection 1.1.4., formulas D 1.6, D 1.7, D 1.8, D 1.9	Further baseline calculations are made with allowance for the cut-off conditions: $G\_HFC23y < MIN\{ P\_HCFC22y; P\_HCFC22hist,max\} \times w_{m}$, (1.6.) $BE_y = (Q\_HFC23_y - B\_HFC23_y) \times GWP\_HFC23$, (1.7.) $Q\_HFC23y = G\_HFC23y - S\_HFC23y - L\_HFC23y$, (1.8) $B\_HFC23y = G\_HFC23y - S\_HFC23y - MPE\_HFC23_{M}st,min$ (1.9)
	Corrections: the formulas are not applicable for the calculation of the baseline emissions as 1. the cut-off conditions are eliminated from the monitoring plan

	2. MPE_HFC23$_{M}$st,min is erroneously taken as a measure of state regulation of emissions
	Justification: Please see above justification to deviation 1. The use of MPE (the minimum level of the maximum permissible emissions) of HFC23 in the atmosphere from sources within the project boundary is inapplicable from the methodological viewpoint as there are no regulations in the Russian Federation requiring the destruction of HFC-23 waste streams.
Deviation 3	**Registered PDD/Deviation/Justification**
Table D 2., ID 9	ID 9 (Volume of HCFC22 produced) is measured by level meters. The measurements should be documented and archived in paper form. The background data should be verified and summarized in the monthly reports. The monthly reports should be cross-checked with production and accounting reports. The equipment shall be calibrated in compliance with the requirements of the Federal Agency for Technical Control and Metrology.
	Correction: this QC&QA is not applicable as the volume of HCFC-22 is not monitored because HCFC-22 production is eliminated from the monitoring plan
	Justification: The reasons for elimination of HCFC-22 production quantities from the monitoring plan are presented above in the justifications to deviation 1 and 2. Therefore these are quantities are not measured and there is no need to exercise QC&QA procedure for the measuring equipment designated for determining such substances.

C.5. Calculation of the GHG leakages

The GHG leakages were calculated using the following formula:

$L_y = ECy \times EF_{co2}\text{^}_{ridy} \times 10^{-3} + StC_y \times EF_{st}$

EC_y is electricity consumption by HFC23 destruction process during 2011, MWh;

$EF_{co2,grid,y}$ is the C02 emissions factor for grid electricity consumption during 2011, kg CO2/MWh;

StC_y is the steam consumption by HFC23 destruction process during 2011, GJ;

EF_{st} is the C02 emission factor for steam consumption, t C02/GJ. According to PDD: = 0,07 t C02e/GJ.

According to Operational Guidelines for Project Design Documents of Joint Implementation Projects.Volume 1.General guidelines.Version 2.3.Ministry of Economic Affairs of the Netherlands. May 2004.GHG emission factor for grid electricity consumed from electrical grid in Russia varies for different years of the crediting period (2008-2012) as follows:

$EF_{co2,grid,2008}$= 565 kg CO2/MWh, $EF_{co2,grid,2009}$= 557 kg CO2/MWh, $EF_{co2,grid,2010}$= 550 kg CO2/MWh,
$EF_{co2,grid,2011}$= 542 kg CO2/MWh, $EF_{co2,grid,2012}$ = 534 kg CO2/MWh.

The GHG leakage		
L_y	t CO2-e	147

C.6. Calculation of GHG emission reductions

The GHG emission reductions are calculated using the following formula:

$ER_y = BE_y - E\_DP_y - L_y$

The GHG emission reductions		
ER_y	t CO2-e	1 108 563

In compliance with the paragraph 40 of the "Guidance on criteria for baseline setting and monitoring, Version 02" the project participants are encouraged to improve the monitoring process and its results. Revisions, if any, to the monitoring plan to improve the accuracy and/or applicability of information collected shall be justified by the project participants and shall be submitted for the determination referred to in paragraph 37 of the JI guidelines by the AIE. In this case the AIE shall determine whether the proposed revisions improve accuracy and/or applicability of information collected, compared to the original monitoring plan without changing conformity with the relevant rules and regulations for the establishments of monitoring plans and in case of a positive determination, shall proceed with the determination referred to in paragraph 37 of the JI guidelines.

Revisions introduced in the monitoring plan of the project design document (PDD) of the above project[1] represent elimination of such factors *as the cut-off conditions and baseline quantity of HFC23 destroyed,* which are, in first case, inapplicable due the absence of accurate and representative information, and, in the second case, are inapplicable due to erroneous use of the maximum permissible emissions as a measure of the state regulation of emissions of such a gas and due to the absence of information that HFC23 was historically destroyed.

Below the reasons of elimination of these factors from the monitoring plant are provided a greater detail.

Revision 1: Cut-off conditions

Baseline emissions in the monitoring plan of the PDD are made with allowance for cut-off condition (formula D.1-6)

$$G\_HFC23_y \le MIN\left\{P\_HFC22_y;\ P\_HFC22_{Hist,\max}\right\} \times w_h$$

where P_HFC22_y - is the amount of HCFC22 produced at JSC Halogen during the year y, t;

$P\_HFC22_{Hist,\max}$ - *is the maximum annual amount of HCFC22 produced at the plant during the historical period For* $P\_HFC22_{Hist\ max}$ *the maximum annual volume of HCFC22 production at JSC Halogen during the period of 2002-2004 was taken.*

w_h - is the fraction of HFC23 per unit of HCFC-22 produced at the plant. For the fraction w_h its minimum average annual value according to actual data of *JSC Halogen* during the period 2002-2004 were assumed.

Justification of inapplicability of the maximum annual amount of HCFC22 produced at the plant during the historical period 2002-2004.

[1] A JI-specific approach is used for monitoring with the elements of approved CDM methodology AM0001/Version 05.2 "Incineration of HFC23 waste streams", which are associated with the application of the maximum permissible emissions as a measure of the state regulation of HFC-23 emissions.

The values of annual amounts of HCFC22 produced in 2002-2004 were provided in the table B.1-1 "Data needed for calculation of GHG emission reductions" of PDD:

Table 1. Annual amounts of HCFC22 produced in 2002-2004 provided in the PDD

Designation	Unit	2002	2003	2004
P_HCFC22y	t	6 928,4	7 245,0	**9 524,0**

However, these figures are inaccurate. The matter is that they are defined through calculations with the use of old consumption norms that are less accurate than those of nowadays[2]. The old consumption norms were determined on the base of parameters measured during HCFC-22 production process with the use of metering equipment of lower accuracy class. In 2004 there was adoption at the Plant of more accurate metering devices, such as radar level gages that allowed introducing more accurate consumption norms on raw materials (hydrogen fluoride, chloroform) and on HCFC-22 for monomer M-4 production. According to the chief mythologist's information, the radioactive level meters UR-8 installed at HCFC-22 tanks (accuracy class 0.4; relative error +/- 0,8%) were replaced with the radar level gages VEGAFLEX 61 (accuracy class 0.1) and module MAC-D-04 (accuracy class 0.25, relative error +/- 0.3%). The old weigher RP-3Sh at HCFC-22 shipping line (absolute error +/- 5 kg) was replaced with a new automated shipping system (absolute error +/- 2,5 kg)[3]. Thus, the accuracy of calculations of HCFC-22 production was improved (by 4 times in accuracy class terms) from 2005 onwards. Below is the table showing the old consumption norms on HCFC-22 production that were before 2005 and the new norms that were introduced after 2005.

Table 2. Consumption norms on HCFC-22 production at JSC "HaloPolymer-Perm"[4]

Product	Raw material	Unit	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
HCFC-22	Hydrogen fluoride	kg/t	525	520	508	508	508	516	516	516	516	516	516
	Chloroform	kg/t	1460	1460	1460	1460	1430	1450	1450	1450	1450	1450	1450
M-4	HCFC-22	kg/t	2260	2260	2150	2100	2080	2060	2060	2060	2060	2060	2060

2 Procedure of estimation of HCFC22 ouput.

3 Reference on replacement of old metering devices at HCFC-22 production equipment

4 Reference from JSC "Halopolymer- Perm"

As can be seen from the table 2 consumption norms associated with HCFC-22 production were finally changed in 2005 and further on remain constant until present time. The recalculation of HCFC-22 production during 2002-2004 with the use of more accurate norms of 2010 gives divergence from the values of HCFC produced in 2002-2004 provided in the PDD.

Table 3. Divergence in values HCFC-22 production in 2002-2004[5]

Designation	Unit	2002	2003	2004
HCFC-22 production recalculated according to PDD	t	6 928,4	7 245,0	9 524,0
HCFC-22 production recalculated according to 2010 norms	t	6 601,7	8 174,1	10 146,8
Absolute divergence	т	-326,7	929,1	622,8
Relative divergence	%	*-4,7*	*12,8*	*6,5*

The divergence in values of HCFC-22 production in 2002-2004 is considerable ranging within -4,7% till 12,8%. Therefore the values of HCFC-22 production in 2002-2004 in PDD are inaccurate and, hence, cannot be applicable for setting the cut-off condition for the baseline GHG emissions calculation.

As was provided in the PDD the cut-off conditions were set to exclude the possibility of manipulating the production process to increase the quantity of waste. However HCFC22 production at the Plant does, in no way, associate with manipulation as this product is manufactured exclusively to meet delivery obligations in front of purchasers and for being a feedstock for fluoroplastics production.

In the following tables the figures on production of fluoroplastics, gross output of HCFC22 and stocks as well as the average prices for 2000-2010 are presented[6]:

Table 4. Output of fluoroplastics and HCFC22 at JSC HaloPolimer-Perm

Designation	Unit	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
		Gross	Gross	Gross	Gross	Gross	Gross	Gross	Gross	Gross	Gross	Gross
Fluoroplastics	t	3 979	4 470	2 442	3 119	4 215	4 547	4 770	5 049	4 911	2 582	3 512

[5] Reference from JSC "HaloPolymer-Perm". Calculations of HCFC-22 production according to norms of 2010.
[6] Reference data provided by the economical department of JSC "HaloPolimer Perm"

HCFC22	t	9 732	10124	6 928	8 165	10303	11276	11745	12252	12916	8 687	13349

Table 5. Fluoroplastics and HCFC22 in stocks as of the beginning of the year in 2005-2010, JSC "HaloPolymer-Perm"

Year	Unit.	01.01.05	01.01.06	01.01.07	01.01.08	01.01.09	01.01.10
Fluoroplastics	**t**	**124,57**	**460,80**	**208,36**	**131,10**	**392,43**	**237,85**
Finished goods	t	20,40	305,08	104,23	53,13	263,11	94,62
Semi-finished goods	t	8,86	27,93	34,87	38,70	25,12	4,32
Work-in-progress	t	95,32	127,78	69,25	39,26	104,19	138,90
HCFC22	**t**	**239,88**	**342,83**	**221,83**	**34,46**	**190,14**	**108,02**
Finished goods	t	130,06	203,62	111,53	4,86	106,26	1,81
Semi-finished goods	t	0	1,01	0	0	0	0
Work-in-progress	t	109,81	138,20	110,30	29,60	83,88	106,21

Table 6. Average shipping prices on fluoroplastics and HCFC 22 in 2000-2010, JSC HaloPolymer

Year	Unit	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Fluoroplastics	Ths. Rub/t	176	202	199	156	271	169	137	152	163	186	228
HCFC 22	Ths. Rub/t	52	53	44	42	43	46	52	54	65	52	87

It follows from the above tables that the Plant does not manufacture HCFC22 in excessive quantities purposefully intending to increase the formation of HFC23. The quantity of HCFC22 production depends on the impact of the favorable situation on the market what is confirmed by positive HCFC22 price rise dynamics from 2006. Moreover the increase of prices on fluoroplastics stimulates production and, hence, increased consumption of HCFC22 for the production of fluroplastics.

Resume:

1. Values presented in the table B1-1 of PDD, on the base of which the maximum annual amount of HCFC-22 produced at the Plant during the historical period are defined, are not accurate. Those values were defined with use of old consumption norms that were calculated on the base of parameters measured during HCFC-22 production process with the use of metering equipment of lower accuracy class.

2. Recalculation of historical HCFC-22 production of the period of 2002-2004 with the new accurate norms of 2010 year gives more precise values, which considerably (from -4,7% up to 12,8%) deviate from those of provided in PDD.

3. Any manipulations associated with artificial overstating of HCFC22 production to increase purposefully formation of HFC23 are ruled out at the Plant.

In connection with above such factor as *the maximum annual amount of HCFC22 produced at the plant during the historical period 2002-2004* is inapplicable and therefore it must be eliminated as the cut-off condition for calculation of the baseline GHG emissions from the monitoring plan of the mentioned project.

Justification of inapplicability of minimum average annual value of fraction of HFC23 per unit of HCFC-22 produced at the plant according to actual data of JSC Halogen during the period 2002-2004.

The values of the fraction of HFC23 per unit of HCFC-22 produced in 2002-2004 were provided in the line w_h.of the table B.1-1 "Data needed for calculation of GHG emission reductions" of PDD:

Table 7. Average annual value of fraction of HFC23 per unit of HCFC-22 produced as per PDD

Designation	Unit	2002	2003	2004
w_h	%	**1,30**	1,50	1,40

However these figures cannot be justified by the Plant's data as it is quite unclear what the point was (or the points were) which data were taken from for defining the w_h. The point is that this factor can be calculated given the results of composition analysis of the HCFC-22 production as after synthesis reactor so in the other HCFC22 production line points.

In opinion of JSC HaloPolymer Perm specialist above figures were defined not for some point but on the ground of one-shot analyses which were not duly monitored. Depending on a sampling position point the result of analysis will be different as the target product (HCFC22) is sequentially rectified from impurities. Therefore the above figures are not representative.

Annual average figures on HFC-23 fraction per unit of HCFC-22 can only be obtained from averaging the actual results of chromatographic analysis of HCFC-22 sampling. The chromatographic analysis is implemented on-shift basis under the permanent technological regulation of HFCF-22 production. Data on composition of HCFC-22 on a base of sampling at certain points of the reactor are registered with Chromatographic control log and are input in the electronic data base. In the end of each month the processed results of analysis (including HFC-23 fraction) in terms of minimal, maximal and average values are submitted to the technologist of the shop[7]. Further on the average values are registered with the monthly technical reports. According to the results of the chromatographic analysis the actual values of fractions of HFC-23 per unit of HCFC produced at the plant in 2002-2006 were as follows:

[7] Reference on the procedure of chromatographic analysis of HCFC-22 production

Table 8. Actual annual average values of HFC-23 fraction per unit of HCFC-22[8]

Designation	Unit	2002	2003	2004
HCFC-22 production	t	6928,4	7245	9524
HFC-23 formation	t	118,2	184,7	212,1
w_h actual[9]	%	1,79	2,26	2,09
w_h in PDD	%	1,3	1,5	1,4
Divergence	%	30%	99%	59%

As can be seen the divergence between w_h values in PDD and values based on data of chromatographic analysis is considerable. Therefore w_h values in PDD are not representative.

Direct measurements of the waste HFC-23 gas stream fed to destruction under the project give more accurate results. Data on waste gas are directly measured in the points set at the pipelines offtaking after the rectification column to the destruction unit. Based on measurements the mass flow, chemical composition and density of the gas are defined. Devices used for measurements of these data undergo periodically through calibration and testing procedure in compliance with the requirements of the Federal Agency for Technical Control and Measurements and have the low inaccuracy level. According the direct monitoring data the annual average values w_h made in 2008-2010[10]:

w_h	2008	2009	2010	2011 (5 months)
min	1,8	1,3	2,09	2,7
max	2,5	2,5	2,99	2,93
average	2,2	1,8	2,69	2,83

[8] Reference_ Calculation of fraction of HFC-23 per unit of HCFC-22 based on actual data
[9] EXCEL file_calculations based on data provided by the technologists of the shop of JSC HaloPolymer
[10] Reference of the head of the technical department of JSC HaloPolymer-Perm

Resumes:

1. Data provided in the table B1-1 of PDD, on the base of which the minimum value of the fraction of HFC23 per unit of HCFC-22 produced at the plant in the period of 2002-2004, cannot be justified by the Plant's documentary evidences therefore these data is not representative.

2. The representative data on values of the fraction of HFC23 per unit of HCFC-22 produced at the Plant can only be obtained from the results of the chromatographic analysis that are kept with the HCFC production shop technologist. Given averaging, on a yearly basis, the results of the chromatographic analysis the w_h values considerably differ from PDD w_h values.

3. In connection with above *the minimum average annual value of fraction of HFC23 per unit of HCFC-22 produced at the JSC Halogen during the period 2002-2004* is inapplicable and therefore it must be eliminated as the cut-off condition for calculation of the baseline GHG emissions from the monitoring plan of the mentioned project.

General resume on cut-off conditions:

Thus, the cut-off conditions imposed under the PDD were defined incorrect and are not representative and must be eliminated from the monitoring. Therefore for enhancing accuracy and applicability of data used for the monitoring the GHG baseline emissions will be defined as HFC23 quantity supplied to destruction unit per the reporting period, which will be obtained through direct and on-line measurement of waste HFC-23 gas flow with the use of the certified and calibrated measurement devices.

Revision 2: Baseline quantity of HFC23 destroyed during the year

Baseline GHG emissions during the year are defined according to the formula D.1-7 provided in the monitoring plant of PDD:

BEy=(Q_ HFC23y - B_ HFC23y) GWP_ HFC23,

where Q_ HFC23y – is the quantity of HFC23 supplied for destruction into the unit during the year *y*, t
B_ HFC23y – is the baseline quantity of HFC23 destroyed during the year *y*, t.

At the same time, according to the formula D.1-9:
$B\_HFC23y=G\_HFC23y - S\_HFC23y - MPE\_HFC23_{Hist,min}$
if B_HFC23y<0, then we take B_HFC23y=0;

где G_HFC23y – is the amount of HFC23 generated in HCFC22 production line during the year y,t;
S_HFC23y – is the quantity of HFC23 recovered for sale during the year y, t;

$MPE\_HFC23_{Hist,min}$ - is the minimum level of the maximum permissible emissions (MPE) of HFC23 to the atmosphere from sources within the project boundary (condensation and rectification column of HCFC22 production line and rectification column of saleable HFC23 production line) during the year *y* based on historical data (2002-2004), t. According to Section B. 1 $MPE\_HFC23_{Hist,min}$ =45,3 t.

The revision introduced in the monitoring plan of PDD envisages canceling the application of the minimum level of the maximum permissible emissions (MPE) of HFC23 to the atmosphere from sources within the project boundary on a ground that MPE was erroneously taken in the PDD for the fraction of the waste stream required to be destroyed by the regulations.

The methodology AM0001/Version 05.2 "Incineration of HFC23 waste streams prescribes to define "the baseline quantity of HFC-23 destroyed as the quantity of the HFC-23 waste streams required to be destroyed by the applicable regulation or:

$B\_HFC\_23=Q\_HFC23_y*r_y$

Where:

r_y is the fraction of the waste stream required to be destroyed by the regulations that apply during the year. In the absence of regulations requiring the destruction of HFC-23 waste, $r_y = 0$. Absent regulations on HFC-23 emissions, the HFC23 waste is typically released to the atmosphere so the baseline is zero destruction."

The government environmental control in the Russian Federation is stipulated by the federal laws such as "On environment protection", "On atmosphere air protection", "On epidemiological welfare of population", Decrees of the Government of Russian Federation dd. 15.01.2001 от 15.01.2001 № 31 «On approval of Regulation on the government control over protection of atmospheric air» and dd. 23.08.2000 № 622 «On approval of Regulation on the government monitoring service for state of the environment». None of these legislatorial documents does provide for the requirement of obligatory destruction of the HFC-23 waste stream. Due to low hazard grade the payments for emissions of HFC23 are not collected as according to Decree of the Government of RF dd. 12.06.2003 № 344 "On norms of payments for emissions in the atmospheric air" the norms of payments are not provided for".

Besides, plants themselves elaborate projections of maximum permissible emissions of polluting substances in atmospheric air with a purpose to meet the requirements of hygienic criteria of the quality of atmospheric air (MPC) within and beyond sanitary-protection zone (SPZ), including the territories of human settlements,.

Thus, **it is MPC on the boundary of sanitary-protection zone of a plant that is a measure of the government control.** Values of MPE of polluting substances in the atmosphere are defined by a plant itself subject to compliance with MPC on the boundary of SPZ.

Following the calculations for defining the maximum permissible emission of HFC23 in the quantity of 1000 tonnes [11] two conclusions were made:

[11] "Calculation of the maximum permissible emission of HFC-23 and estimation of impact on the size of the sanitary-protection zone from the source # 148 JSC Halogen in the quantity of 1000 t", Perm, 2008

1. **Increase of HFC23 emission does not impact on the sizes of SPZ of JSC Halogen.**
2. **MPE of HFC23 taking into account zero background concentration of this substance is equal to 5 900 t/y.**

It means, in fact, that the Plant could, without a damage to environment, and without breaking the environmental legislation, in 2010 (as in any year of the considered period of 2000-2012) emit in the atmosphere all waste HFC23 not destroying it. At the same time the set MPC would not be exceeded.

Besides, the Plant disposes of information (confirmed by technical reports) that in the course of the previous 20 years HFC23 has not been historically destroyed at the old thermal unit.

Resume:

1. Use of the minimum level of the maximum permissible emissions of HFC23 in the atmosphere from sources within the project boundary is inapplicable from the methodological viewpoint as there are not regulations in the Russian Federation requiring the destruction of HFC-23 waste streams.
2. To exceed MPC *JSC HaloPolimer-Perm* would have had to increase HFC23 emissions higher than 5900 t/y. But it is physically impossible given the HFC23 production level in 2010 that was 365,588 t.
3. Historically, at least previous 20 years, the Plant did not destroy HFC23. Due to the absence of hazard the payments for their emissions were not collected.
4. Therefore all baseline waste HFC23 was harmlessly emitted in atmosphere.

i.e. the formula D 1-7 of the monitoring plan must be as below:

$$BEy=Q\_HFC23y*GWP\_HFC23$$

REVISED MONITORING PLAN

D.1. Description of monitoring plan chosen:

The monitoring system is based on the approved CDM methodology AM0001/Version 05.2 "Incineration of HFC23 waste streams". The monitoring includes measurements of the following parameters (see Fig. D.1-1):

1. The HFC23 waste quantity generated by production process is continuously measured by mass flow meter installed on the outlet pipeline from emission source (readings are automatically recorded hourly). The HFC23 mass content in the HFC23 waste produced is calculated based on concentrations of sample's components measured by chromatograph.
2. The HFC23 waste quantity supplied for destruction is measured continuously by two down-the-line flow meters installed on waste feeding line (readings are automatically recorded hourly). The HFC23 mass content in the HFC23 waste produced is calculated based on concentrations of sample's components measured by chromatograph.
3. The volume of effluent gases from the unit is calculated based on the average flow speed of effluent gases (measured by portable flow meter weekly) and the operating time of the unit during the period. The HFC23 mass concentration in the effluent gases is measured by chromatograph (sample analysis is performed once a week).
4. The HFC23 quantity recovered for sale (if applicable) is determined monthly as HFC23 gross output (commercial output measured by scales + change in inventory measured by level meter).
5. Electricity consumption by HFC23 destruction process is calculated on the basis of electricity consumption norm per unit of HFC23 waste supplied for destruction (to be approved annually by the project owner).
6. Steam consumption by HFC23 destruction process is calculated on the basis of steam consumption norm per unit of HFC23 waste supplied for destruction (to be approved annually by the project owner).
7. Natural gas consumption by HFC destruction process is calculated on the basic of natural gas consumption norm per unit of HFC23 west supplied for destruction (to be approved annually by the project operator).
8. The gaseous emissions (HCl, HF, NO2 and dioxins) are measured in compliance with the current environmental standards of Russia.
9. The liquid effluents (used alkaline solution) are measured with the current environmental standards of Russia.

All the measuring equipment meets up-to-date standards and is subject to regular calibration. The equipment is calibrated by the special organization which is entitled to perform this type of activities. The procedures for monitoring equipment control, maintenance and repair are subject of internal plant instructions.

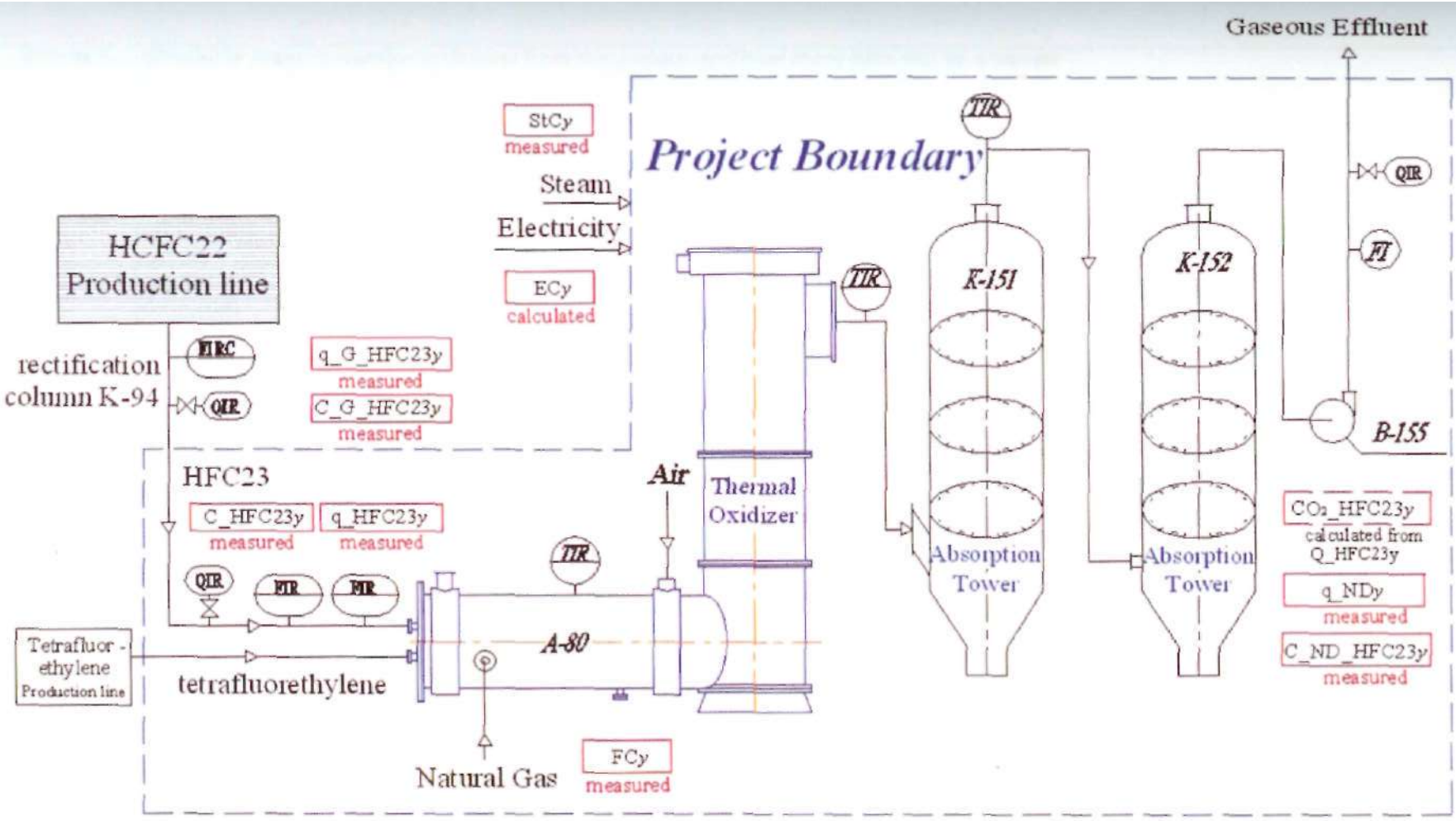

Figure D.1-1. The principal monitoring diagram

D.1.1. Option 1 -Monitoring of the emissions in the project scenario and the baseline scenario:

D.1.1.1. Data to be collected in order to monitor emissions from the project, and how these data will be archived:

ID number *(Please use numbers to ease cross-referencing to D.2.)*	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
1. q_HFC23_y	HFC23 waste quantity supplied to destruction process	2 mass flow meters in parallel	kg	(m) measured	Monthly (hourly readings)	100%	Electronic and paper	Measured in parallel by 2 mass flow meters directly before the unit. Readings are taken hourly and processed by APCS, the lowest reading is chosen automatically by APCS. Monthly data is the sum of the accumulated data.
2. C_HFC23_y	HFC23 mass content in HFC23 waste supplied to destruction process	Chromatograph	%	(m) measured (c) calculated	Monthly (daily measurements)	100%	Electronic and paper	Mass content is calculated based on concentrations of components measured by chromatograph.
3. FC_y	Natural gas consumption by HFC23 destruction process	Flow meter	m3	(c) calculated	Monthly	100%	Electronic and paper	Natural gas consumption is calculated by the project operator annually on the basis of flow meter measurement.

4.q_ND_y	Volume of gaseous effluent from the unit	Portable flow meter	m3	(m) measured (c) calculated	Monthly (weekly measurements)	100%	Electronic and paper	Calculated conservatively based on effluent gas flow speed and length of the period.
5. $C\_ND\_HFC23_y$	HFC23 concentration in gaseous effluents from the unit	Chromatograph	mg/m3	(m) measured	Monthly (weekly measurements)	100%	Electronic and paper	If the HFC23 concentration is not detectible than the value is conservatively taken to be equal 1,0 mg/m3. Monthly data is the average value.

D.1.1.2. Description of formulae used to estimate project emissions (for each gas, source etc.; emissions in units of CO2 equivalent):

The project GHG emissions during the year y, t CO_2-e:

$$E\_DP_y = ND\_HFC23_y \times GWP\_HFC23 + FC_y \times EF_f + Q\_HFC23_y \times EF_h \quad \text{(D.1-1)}$$

Where ND_HFC23_y is the quantity of HFC23 not destroyed in the unit during the year y, t;

FC_y is the natural gas consumption by HFC23 destruction process over a year y, m3;

EF_f is CO_2 emission factor of natural gas combustion, t CO_2e/m3;

Q_HFC23_y is the quantity of HFC23 supplied for destruction during the year y, t;

EF_h is the emissions factor that determines the amount of CO_2 generated per 1 ton of HFC23 supplied for destruction. According to CDM methodology AM0001, EF_h = 0,62857 t CO_2e/t;

GWP_HFC23 is the Global Warming Potential (GWP) that converts 1 ton of HFC23 to tons of CO2 equivalent, t CO_2e/t. The approved GWP value for HFC23 is 11 700 t CO_2e/t for the first commitment period under the Kyoto Protocol;

$$ND\_HFC23_y = q\_ND_y \times C\_ND\_HFC23_y \times 10^{-9}, \quad \text{(D.1-2)}$$

$$Q\_HFC23_y = q\_HFC23_Y \times 10^{-2} \times C\_HFC23_Y \times 10^{-3}, \quad \text{(D.1-3)}$$

Where q_ND_y is volume of gaseous emissions from destruction process during the year y, m3;

q_HFC23_y is the amount of HFC23 wastes supplied for destruction during the year y, kg;

$C\_ND\_HFC23_y$ is the average annual concentration of HFC23 in gaseous emissions from the unit during the year y, mg/m3;
C_HFC23_y is the average annual concentration of HFC23 in wastes supplied for destruction during the year y, %;

D.1.1.3. Relevant data necessary for determining the baseline of anthropogenic emissions of greenhouse gases by sources within the project boundary, and how such data will be collected and archived:

ID number *(Please use numbers to ease cross-referencing to D.2.)*	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
6. S_HFC23_y	HFC23 quantity recovered for sale	Scales and level meter in the collector	t	(m) measured	Monthly	100%	Electronic and paper	Not applied if there is no HFC23 recovered for sale from HFC23 waste or there is no technical possibility.
7. $q\_G\_HFC23_y$	HFC23 waste quantity generated	Mass flow meter	kg	(m) measured	Monthly (hourly readings)	100%	Electronic and paper	Measured by mass flow meter directly after emission sources. Readings are taken hourly and processed by APCS. Monthly data is the sum of the accumulated data.
8. $C\_G\_HFC23_y$	HFC23 mass content in HFC23 waste generated	Chromatograph	%	(m) measured (c) calculated	Monthly (weekly measurements)	100%	Electronic and paper	Mass content is calculated based on concentrations of components measured by chromatograph.

D.1.1.4. Description of formulae used to estimate baseline emissions (for each gas, source etc.; emissions in units of CO_2 equivalent):

At first HFC23 leaks to the atmosphere within the project boundary are calculated according to actual data during the year y, t:

$L\_HFC23_y = G\_HFC23_y - Q\_HFC23_y - S\_HFC23_y$, (D.1-4)

Where G_HFC23_y is the amount of HFC23 at the outlet from HCFC22 production line during the year y, t;

Q_HFC23_y is the quantity of HFC23 supplied for destruction during the year y, t;

S_HFC23_y is the amount of HFC23 recovered for sale during the year y, t.

$G\_HFC23_y = q\_G\_HFC23_y \times 10^{-2} \times C\_G\_HFC23_y \times 10^{-3}$, (D.1-5)

Where $q\_G\_HFC23_y$ is the is the amount of wastes containing HFC23 at the outlet of rectification columnK94, kg;

$C\_G\_HFC23_y$ is the average annual concentration of HFC23 in wastes at the outlet of rectification columnK94, %;

Baseline GHG emissions during the year y, t CO_2-e:

$BE_y = Q\_HFC23_y \times GWP\_HFC23$, (D.1-6)

This section is not applicable to this project.

D.1.2.1. Data to be collected in order to monitor emission reductions from the project, and how these data will be archived:								
ID number *(Please use numbers to ease cross-referencing to D.2.)*	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment

D.1.2.2. Description of formulae used to calculate emission reductions from the project (for each gas, source etc.; emissions/emission reductions in units of CO2 equivalent):

D.1.3. Treatment of leakage in the monitoring plan:

D.1.3.1. If applicable, please describe the data and information that will be collected in order to monitor Leakage effects of the project:								
ID number *(Please use numbers to ease cross-referencing to D.2.)*	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
9. EC_y	Electricity	Meter	MWh	(c) calculated	Monthly	100%	Electronic and paper	Calculated on

	consumption by destruction process							the basis of electricity consumption standard per unit of HFC23 waste supplied for destruction (to be approved annually by the project owner).
$10.StC_y$	Steam consumption by destruction process	Meter	GJ	(c) calculated	Monthly	100%	Electronic and paper	Calculated on the basis of steam consumptionnorm per unit of HFC23 waste supplied for destruction (to be approved annually by the project owner).

D.1.3.2. Description of formulae used to estimate leakage (for each gas, source etc.; emissions in units of CO2 equivalent):

Leakages due to energy consumption by HFC23 destruction process during the year y are calculated as follows, t C02:

$L_y = EC_y \times EF_{co\_gridy} \times 10^{-3} + StC_y \times EF_{st}$ (D.1-7)

where

EC_y is electricity consumption by the thermal destruction unit during the year y,

MWh; $EF_{co2}{}^{\wedge}{}_y$ is the C02 emissions factor for grid electricity during the year y, kg CO2/MWh;

StC_y is the steam consumption for FOC destruction process during the year y, GJ;

EF_{st} is the C02 emission factor for steam consumption supplied by municipal CHP plant, t C02/GJ. According to Section B.1: = 0,070 t C02e/GJ.

According to Operational Guidelines for Project Design Documents of Joint Implementation Projects.Volume 1.General guidelines.Version 2.3.Ministry of Economic Affairs of the Netherlands. May 2004. GHG emission factor for grid electricity consumed from electrical grid in Russia varies for different years of the crediting period (2008-2012) as follows:

$EF_{CO2,grid,2008}$= 565 kg CO2/MWh, $EF_{CO2,grid,2009}$= 557 kg CO2/MWh, $EF_{CO2,grid,2010}$= 550 kg CO2/MWh, $EF_{CO2,grid,2011}$= 542 kg CO2/MWh, $EF_{CO2,grid,2012}$= 534 kg CO2/MWh.

D.1.4. Description of formulae used to estimate emission reductions for the project (for each gas, source etc.; emissions/emission reductions in units of CO2 equivalent):

Emission reductions during the year y measured in t CO2e are calculated as follows:

$ERy = BEy - E\_DPy - Ly$ (D.1-8)

D.1.5. Where applicable, in accordance with procedures as required by the host Party, information on the collection and archiving of information on the environmental impacts of the project:

Gaseous effluents (HCl, HF, NO2 and dioxins) are measured in compliance with the current environmental standards of Russia:

HCl, HF, NO2 - 6 time per year

Dioxins - 1 time per year

The enterprise files annual consolidated reports on emissions as per the official annual statistical form 2-TP (air) Data on Atmospheric Air containing information on the quantities of trapped and destroyed air pollutants, detailed emissions of specific pollutants, number of emission sources, emission reduction actions and emissions from separate groups of pollutant sources. The enterprise is subject to regular control by state bodies of environmental supervision. The Head of Technical Department is responsible for collection, storage and analysis of data regarding the environmental impact of the project in the region.

D.2. Quality control (QC) and quality assurance (QA) procedures undertaken for data monitored:		
Data *(Indicate table and ID number)*	Uncertainty level of data (high/medium/low)	Explain QA/QC procedures planned for these data, or why such procedures are not necessary.
Table D.1.1.1 ID 1	low	Measured by two down-the-line mass flow meters. Instrument error ±0,5%. Readings are automatically collected, stored, processed and protected from any corrections by APCS. APCS should automatically calculate the conservative value by taking the least value of the two mass flow meters at each data reading. The daily reports with corresponding accumulated data from APCS should be archived in electronic form. The data should be verified monthly and the reports with corresponding verified data should be archived in paper form. Mass flow meters shall be calibrated in compliance with the requirements of the Federal Agency for Technical Control and Metrology. The zero check on the flow meters shall be conducted every week. If the zero check indicates that the flow meter is not stable, an immediate calibration of the flow meter shall be undertaken. If the readings of the mass flow meters differ by greater than twice their claimed accuracy then measures are taken to remedy the fault.
Table D.1.1.1 ID 2 Table D.1.1.3 ID 5 Table D.1.1.3 ID 8	low	Calculated by approved method (relative error - 5%) based on concentrations of sample's components measured by chromatograph daily. The measurements and calculation of mass content should be performed by laboratory personnel, documented in paper form and archived in electronic form. The results are to be verified. The data should be cross-checked with the previous data and summarized in the monthly reports. Chromatographs shall be calibrated in compliance with the requirements of the Federal Agency for Technical Control and Metrology: absolute calibration - 1 time per year, calibration measurement - 1 time per quarter.
Table D.1.1.1 ID 3	low	Measured by natural gas meter. The accuracy of the equipment and following calculation has little influence on accuracy of GHG emission reduction calculations. Gas meter is subject to regular calibration in compliance with the requirements of the Federal Agency for Technical Control and Metrology - once in 3 years.

Table D.1.1.1 ID 4	low	Measured by portable flow meter and calculated based on the calendar length of period (hours/period). To provide conservative estimate the shutdown time of the destruction unit is not included in calculation. The accuracy of the equipment and the method has little influence on accuracy of GHG emission reduction calculations. Portable flow meter is subject to regular calibration in compliance with the requirements of the Federal Agency for Technical Control and Metrology - once in 2 years.
Table D.1.1.3 ID 7	low	Measured by mass flow meter. Instrument error ±0,5%. Readings are automatically collected, stored, processed and protected from any corrections by APCS. The daily reports with corresponding accumulated data should be archived in electronic form. The data should be verified monthly and the reports with corresponding verified data should be archived in paper form. Mass flow meters shall be calibrated in compliance with the requirements of the Federal Agency for Technical Control and Metrology. The zero check on the mass flow meter shall be conducted on demand. If the zero check indicates that the mass flow meter is not stable, an immediate calibration of the mass flow meter shall be undertaken.
Table D.1.1.3 ID 6	low	Measured by level meters. The measurements should be documented and archived in paper form. The background data should be verified and summarized in the monthly reports. The monthly reports should be cross-checked with production and accounting reports. The equipment shall be calibrated in compliance with the requirements of the Federal Agency for Technical Control and Metrology.
Table D.1.3.1 ID 10	low	Measured by heat meter. The equipment shall be calibrated in compliance with the requirements of the Federal Agency for Technical Control and Metrology - once in 2 years. Steam consumption standards for each of destroyed substances are calculated and approved by project operator at the end of the year based on the measured steam consumption.

D.3. Please describe the operational and management structure that the project operator will apply in implementing the monitoring plan:

The operational and management structure comprises Project operator and Holding company.

The monitoring procedures are executed by the Project operator according to Organization standard (monitoring procedure) set forth by the Order of the General director. According to the Order all readings in line with the monitoring plan have to be recorded under an established procedures and persons responsible for data collection and storage appointed starting on 01.01.2008.

The monitoring report is prepared by Project Operator.

The data monitored and required for verification are to be kept for two years after the last transfer of ERUs for the project.

The project execution is supervised by the Holding company Halopolymer.

Revision 1	**Registered PDD / Intended deviation / Explanation and Justification**
D.1. Description of monitoring plan chosen Item 1	The quantity of technological emissions of HFC23 from HCFC22 production line is measured continuously by a mass flow meter installed on the outlet pipeline from the emission source (columnK-94). Content of HFC23 is measured by laboratory chromatographs daily.
	The HFC23 waste quantity generated by production process is continuously measured by mass flow meter installed on the outlet pipeline from emission source (readings are automatically recorded hourly). The HFC23 mass content in the HFC23 waste produced is calculated based on concentrations of sample's components measured by chromatograph.
	Correction: 1. Mass content is calculated (not measured) due to absence of direct method to measure mass content in sample. This deviation doesn't influence the GHG reduction calculation.
Revision 2	**Registered PDD / Intended deviation / Explanation and Justification**
D.1. Description of monitoring plan chosen Item 2	The quantity of HFC23 technological emissions fed to the thermal destruction unit is measured continuously by two down-the-line flow meters installed on the waste feeding line. Content of HFC23 is measured by laboratory chromatographs daily.
	The HFC23 waste quantity supplied for destruction is measured continuously by two down-the-line flow meters installed on waste feeding line (readings are automatically recorded hourly). The HFC23 mass content in the HFC23 waste produced is calculated based on concentrations of sample's components measured by chromatograph.
	Correction: 1. Mass content is calculated (not measured) due to absence of direct method to measure mass content in sample. This deviation doesn't influence the GHG reduction calculation. 2. Sample analysis is made weekly (not daily).This deviation doesn't influence the GHG reduction calculation.
Revision 3	**Registered PDD / Intended deviation / Explanation and Justification**
D.1. Description of monitoring plan chosen Item 3	The volume of effluent gases from the unit is measured by a volumetric flow-meter. HFC23 content in the gases is measured by a laboratory chromatograph once a week.
	The volume of effluent gases from the unit is calculated based on the average flow speed of effluent gases (measured by portable flow meter weekly) and the operating time of the unit during the period. The HFC23 mass concentration in the effluent gases is

	measured by chromatograph (sample analysis is performed once a week).
	Clarification: 1. The volume of effluents gases is calculated (not measured) on the basis of month average effluent gas flow speed (m3/hour) measured by portable flow meter weekly. 2.
Revision 5	**Registered PDD / Intended deviation / Explanation and Justification**
D.1. Description of monitoring plan chosen Item 5	In case HFC23 is recovered for sale, its quantity is determined on a monthly basis as a sum of the amount of the product loaded into cylinders and containers (measured by scales) and finished product left in the collector (measured by the level meter of the finished product collector).
	The HFC23 quantity recovered for sale (if applicable) is determined monthly as HFC23 gross output (commercial output measured by scales + change in inventory measured by level meter).
	Correction: 1. According to the registered PDD the HFC23 inventory is not included in calculation. Therefore, the gross output (commercial output + change in inventory) should be determined.
Revision 6	**Registered PDD / Intended deviation / Explanation and Justification**
D.1. Description of monitoring plan chosen	Electricity consumption is measured on the basis of electricity consumption standards which are approved annually.
	Electricity consumption by HFC23 destruction process is calculated on the basis of electricity consumption norm per unit of HFC23 waste supplied for destruction (to be

Item 6	approved annually by the project owner).
	Clarification: 1. Electricity consumption is calculated (not measured) as it is not measured only for HFC23 supplied for destruction, but for all wastes supplied for destruction.
Revision 7	**Registered PDD / Intended deviation / Explanation and Justification**
D.1. Description of monitoring plan chosen Item 7	Steam consumption is measured by heat meter.
	Steam consumption by HFC23 destruction process is calculated on the basis of steam consumption norm per unit of HFC23 waste supplied for destruction (to be approved annually by the project owner).
	Correction: 1. Steam consumption is calculated (not measured) as it is not measured only for HFC23 supplied for destruction, but for all wastes supplied for destruction.
Revision 8	**Registered PDD / Intended deviation / Explanation and Justification**
D.1. Description of monitoring plan chosen Item 8	Natural gas consumption is measured by flow meter.
	Natural gas consumption by HFC23 destruction process is calculated on the basis of natural gas consumption norm per unit of HFC23 waste supplied for destruction (to be approved annually by the project owner).
	Correction: 1. Natural gas consumption is calculated (not measured) as it is not measured only for HFC23 supplied for destruction, but for all wastes supplied for destruction.
Revision 9	**Registered PDD / Intended deviation / Explanation and Justification**
D.1. Description of monitoring plan chosen Item 9	The quantity of gaseous emissions (CO, HCl, HF, Cl2, organic carbon, dioxins and NOx) is measured in compliance with the current environmental standards of Russia.
	The gaseous emissions (HCl, HF, NO2 and dioxins) are measured in compliance with the current environmental standards of Russia.
	Clarification:

	1. Organic carbon, Cl2 and CO are not generated by the destruction process, so they are excluded.
Revision 10	**Registered PDD / Intended deviation / Explanation and Justification**
D.1. Description of monitoring plan chosen Item 10	The amount of liquid effluents and their parameters (pH, COD BOD, suspended solids, fluorides and metals) are measured in the established order.
	The liquid effluents (used alkaline solution) are measured with the current environmental standards of Russia.
	Clarification: 1. Only used alkaline solution is generated as liquid by-product of the destruction process.
Revision 11	**Registered PDD / Intended deviation / Explanation and Justification**
D.1.1.1. Data to be collected in order to monitor emissions from the project, and how these data will be archived ID 1. q_HFC23_y	Data variable: Quantity of HFC23 wastes supplied to destruction process Source of data: Mass flow meter Data unit: kg Determination method: (m) measured in parallel by two flow meters Recording frequency: Once per week (continuous measurement) Proportion of data to be monitored: 100% How will the data be archived: Electronic and paper Comment: Measured directly before the unit. Monthly data is the sum of the accumulated data. Readings are taken at least once an hour and the lowest reading of the two flow meters is chosen.
	Data variable: HFC23 waste quantity supplied to destruction process Source of data: 2 mass flow meters Data unit: kg Determination method: (m) measured Recording frequency: Monthly (hourly readings) Proportion of data to be monitored: 100% How will the data be archived: Electronic and paper Comment: Measured in parallel by 2 mass flow meters directly before the unit. Readings are taken hourly and processed by APCS,

	the lowest reading is chosen automatically by APCS. Monthly data is the sum of the accumulated data.
	Correction and clarification: 1. The monitoring plan assumes monthly reporting for comparability of monitoring data
Revision 12	**Registered PDD / Intended deviation / Explanation and Justification**
D.1.1.1. Data to be collected in order to monitor emissions from the project, and how these data will be archived ID 2. C_HFC23_y	Data variable: Concentration of HFC23 supplied to destruction process Source of data: Chromatograph Data unit: % Determination method: (m) measured Recording frequency: Once per week (measured once per day) Proportion of data to be monitored: 100% How will the data be archived: Electronic and paper Comment: -
	Data variable: HFC23 mass content in HFC23 waste supplied to destruction process *Source of data: Chromatograph* Data unit: % Determination method: (m) measured, (c) calculated Recording frequency: Monthly (daily measurements) Proportion of data to be monitored: 100% How will the data be archived: Electronic and paper Comment: Mass content is calculated based on concentrations of components measured by chromatograph.
	Correction: 1. The monitoring plan assumes monthly reporting for comparability of monitoring data, so recording frequency is monthly. The measurements for calculation are performed weekly. 2. Mass content is calculated (not measured) due to absence of direct method to measure mass content in sample. HFC23 mass concentration (mg/m3) is calculated based on approved method as:

	Xi = 416,7 x Ci x Mi, where Ci -molar volume content of i component (%),Mi - molar mass of i component. HFC23 mass content (%) is calculated as: Xv = Xi / SUM Xi.
Revision 13	**Registered PDD / Intended deviation / Explanation and Justification**
D.1.1.1. Data to be collected in order to monitor emissions from the project, and how these data will be archived ID 3.FC_y	Data variable: Natural gas consumption during destruction process Source of data: Flow meter Data unit: m3 Determination method: (m) measured Recording frequency: monthly Proportion of data to be monitored: 100% *How will the data be archived: Electronic and paper* Comment: -
	Data variable: Natural gas consumption by HFC23 destruction process Source of data: Flow meter Data unit: m3 Determination method: (c) calculated Recording frequency: monthly Proportion of data to be monitored: 100% How will the data be archived: Electronic and paper Comment: Natural gas consumption is calculated by the project operator annually on the basis of flow meter measurement.
	Correction: 1. Natural gas consumption is calculated (not measured) as it is not measured only for HFC23 supplied for destruction, but for all wastes supplied for destruction.
Revision 14	**Registered PDD / Intended deviation / Explanation and Justification**

D.1.1.1. Data to be collected in order to monitor emissions from the project, and how these data will be archived ID 4.q_ND_y	Data variable: Volume of gaseous effluent from the unit Source of data: Portable volumetric flow meter Data unit: m3 Determination method: (m) measured Recording frequency: Once per week (measured weekly) Proportion of data to be monitored: 100% How will the data be archived: Electronic and paper Comment: Volume is measured by portable flow-meter. The amount is averaged.
	Data variable: Volume of gaseous effluent from the unit Source of data: Portable flow meter Data unit: m3 Determination method: (m) measured, (c) calculated Recording frequency: monthly (weekly measurements) Proportion of data to be monitored: 100% How will the data be archived: Electronic and paper Comment: Calculated conservatively based on effluent gas flow speed and length of the period.
	Correction: 1. The monitoring plan assumes monthly reporting for comparability of monitoring data, so recording frequency is monthly. The measurements for calculation are performed weekly. 2. The volume of effluents gases is calculated (not measured) on the basis of month average effluent gas flow speed (m3/hour) measured by portable flow meter as: q_NDy = V * F * T, where V - monthly average gas flow speed (m/sec), F - sectional area of gas outlet pipe (m2), T - length of period (sec).
Revision 15	**Registered PDD / Intended deviation / Explanation and Justification**
D.1.1.1. Data to be collected	Data variable: Concentration of HFC23 in gaseous effluents from the unit

in order to monitor emissions from the project, and how these data will be archived ID 5. C_ND_HFC23,y	Source of data: Chromatograph Data unit: mg/m3 Determination method: (m) measured Recording frequency: Once per week Proportion of data to be monitored: - How will the data be archived: Electronic and paper Comment: Measured once per week. The amount is averaged.
	Data variable: HFC23 concentration in gaseous effluents from the unit Source of data: Chromatograph Data unit: mg/m3 Determination method: (m) measured Recording frequency: monthly (weekly measurements) Proportion of data to be monitored: 100% How will the data be archived: Electronic and paper Comment: If the HFC23 concentration is not detectible than the value is conservatively taken to be equal 1,0 mg/m3. Monthly data is the average of the calculated data.
	Correction: 1. The monitoring plan assumes monthly reporting for comparability of monitoring data, so recording frequency is monthly. The measurements for calculation are performed weekly.
Revision 16	**Registered PDD / Intended deviation / Explanation and Justification**
D.1.1.3. Relevant data necessary for determining the baseline of anthropogenic emissions of greenhouse gases by sources within the project boundary, and how such data will be collected and	Data variable: Quantity of HFC23 recovered for sale Source of data: Scales and level meter in the collector Data unit: t Determination method: (m) measured Recording frequency: monthly

archived ID 6. S_HFC23_y	Proportion of data to be monitored: 100% How will the data be archived: Electronic and paper Comment: Commercial HFC23 production is not planned
	Data variable: HFC23 quantity recovered for sale Source of data: Scales and level meter in the collector Data unit: t Determination method: (m) measured Recording frequency: Monthly Proportion of data to be monitored: 100% How will the data be archived: Electronic and paper Comment: Not applied if there is no HFC23 recovered for sale from HFC23 waste or there is no technical possibility.
	Clarification
Revision 17	**Registered PDD / Intended deviation / Explanation and Justification**
D.1.1.3. Relevant data necessary for determining the baseline of anthropogenic emissions of greenhouse gases by sources within the project boundary, and how such data will be collected and archived ID 7. $q\_G\_HFC23_y$	Data variable: Quantity of HFC23 wastes at the outlet of rectification columnK94 Source of data: Mass flow meter Data unit: kg Determination method: (m) measured Recording frequency: Monthly (readings are recorded weekly) *Proportion of data to be monitored: 100%* How will the data be archived: Electronic Comment: -
	Data variable: HFC23 waste quantity generated Source of data: Mass flow meter

	Data unit: kg Determination method: (m) measured Recording frequency: Monthly (hourly readings) Proportion of data to be monitored: 100% How will the data be archived: Electronic and paper Comment: Measured by mass flow meter directly after emission sources. Readings are taken hourly and processed by APCS. Monthly data is the sum of the accumulated data.
	Clarification: 1. The readings are recorded hourly (not weekly). 2. The data is archived both electronic and paper.
Revision 18	**Registered PDD / Intended deviation / Explanation and Justification**
D.1.1.3. Relevant data necessary for determining the baseline of anthropogenic emissions of greenhouse gases by sources within the project boundary, and how such data will be collected and archived ID 8. $C\_G\_HFC23_y$	Data variable: Concentration of HFC23 in wastes at the outlet of rectification columnK94 Source of data: Chromatograph Data unit: % Determination method: (m) measured Recording frequency: Monthly (readings are recorded weekly) Proportion of data to be monitored: 100% How will the data be archived: Electronic and paper Comment: -
	Data variable: HFC23 mass content in HFC23 waste generated Source of data: Chromatograph Data unit: % Determination method: (m) measured and (c) calculated Recording frequency: Monthly (weekly measurements) Proportion of data to be monitored: 100%

	How will the data be archived: Electronic and paper Comment: Mass content is calculated based on concentrations of components measured by chromatograph.
	Correction: 1. Mass content is calculated (not measured) due to absence of direct method to measure mass content in sample. HFC23 mass concentration (mg/m3) is calculated based on approved method as: Xi = 416,7 x Ci x Mi, where Ci -molar volume content of i component (%),Mi - molar mass of i component. HFC23 mass content (%) is calculated as: Xv = Xi / SUM Xi.

Revision 21	Registered PDD / Intended deviation / Explanation and Justification
D.1.3.1. If applicable, please describe the data and information that will be collected in order to monitor leakage effects of the project ID 11.EC_y	Data variable: Specific Electricity consumption norm for destruction process Source of data: - Data unit: kWh/t Determination method: Recording frequency: Monthly Proportion of data to be monitored: 100% How will the data be archived: Electronic Comment: The Specific consumption is defined by the Department of Chief Energy Engineer and Technical Department annually based on actual data for the year and are approved by the Chief Engineer of the plant
	Data variable: Electricity consumption by HFC23 destruction process Source of data: Meter Data unit: MWh Determination method: (c) calculated Recording frequency: Monthly Proportion of data to be monitored: 100% How will the data be archived: Electronic and paper Comment: Calculated on the basis of electricity consumption norm per unit of HFC23 waste supplied for destruction (to be approved annually by the project owner).
	Correction: 1. Electricity consumption by HFC23 destruction process is calculated (not measured) as it is not measured only for HFC23 supplied for destruction, but for allwastes supplied for destruction. Calculated on the basis of electricity consumption norm per unit of HFC23 waste supplied for destruction (to be approved annually by the project owner).
Revision 22	**Registered PDD / Intended deviation / Explanation and Justification**

D.1.3.1. If applicable, please describe the data and information that will be collected in order to monitor leakage effects of the project ID 12.StC_y	Data variable: Steam consumption for destruction process Source of data: Meter Data unit: GJ Determination method: (m) measured Recording frequency: Monthly Proportion of data to be monitored: 100% How will the data be archived: Electronic Comment: -
	Data variable: Steam consumption by HFC23 destruction process Source of data: Meter Data unit: GJ Determination method: (c) calculated Recording frequency: Monthly Proportion of data to be monitored: 100% How will the data be archived: Electronic and paper Comment: Calculated on the basis of steam consumption norm per unit of HFC23 waste supplied for destruction (to be approved annually by the project owner).
	Correction: 1. Steam consumption by HFC23 destruction process is calculated (not measured) as it is not measured only for HFC23 supplied for destruction, but for allwastes supplied for destruction. Calculated on the basis of steam consumption norm per unit of HFC23 waste supplied for destruction *(to beapproved annually by the project owner)*.

Revision 24	Registered PDD / Intended deviation / Explanation and Justification
The CO2 emission factor for natural gas combustion	Emission factor for natural gas supplied to JSC Halogen by Gazprom TransgazChaykovskiy, LTD is fixed EFf = 0.00187 t CO2e/m3 (20 °Cas 0.00187 t CO2-e/m3 (20 °C).
	The CO2 emission factor for natural gas combustion is calculated on the basis of coefficients taken from 2006 IPCC Guidelines for National Greenhouse Gas Inventories and the normal density of natural gas equal to 0,73 kg/m3, i.e.: EFf = 48 TJ/Gg * 10-6 Gg/kg * 0,73 kg/m3 * 0,995 * 56,1 tCO2e/TJ = 0,001956 tCO2e/m3 EFf is taken to be equal to 0,002 tCO2e/m3 following the conservative approach. Correction: The CO2 emission factor for natural gas combustion is reviewed and calculated following the conservative approach.

Revision 25	Registered PDD / Intended deviation / Explanation and Justification
D.1.5. Where applicable, in accordance with procedures as required by the host Party, information on the collection and archiving of information on the environmental impacts of the project	Gaseous effluents (CO, HCl, HF, Cl2, dioxin and NOX) are regularly measured at the thermal destruction unit in accordance with the approved rules. The enterprise files annual consolidated reports on emissions as per the official annual statistical form 2-TP (air) Air protection data, which contains information on amounts of trapped and neutralized atmospheric pollutants, itemized emissions from specific sources, number of emission sources, measures on reduction of emissions to the atmosphere, emissions from particular groups of pollution sources. The enterprise is subject to regular control by state bodies of environmental supervision. The Head of Technical Department of JSC Halogen is responsible for collection, storage and analysis of data regarding the environmental impact of the project in the region.
	Gaseous effluents (HCl, HF, NO2 and dioxins) are measured in compliance with the current environmental standards of Russia: HCl, HF, NO2 - 6 time per year Dioxins - 1 time per year The enterprise files annual consolidated reports on emissions as per the official annual statistical form 2-T (air) Data on Atmospheric Air containing information on the quantities of trapped and destroyed air pollutants, detailed emissions of specific

	pollutants, number of emission sources, emission reduction actions and emissions from separate groups of pollutant sources. The enterprise is subject to regular control by state bodies of environmental supervision. The Head of Technical Department is responsible for collection, storage and analysis of data regarding the environmental impact of the project in the region.
	Clarification: 1. Cl2 and CO are not generated by the destruction process, so they are excluded.
Revision 26	**Registered PDD / Intended deviation / Explanation and Justification**
D.2. Quality control (QC) and quality assurance (QA) procedures undertaken for data monitored ID 1. q_HFC23_y	Low uncertainty level Measured by two down-the-line flow meters. Instrument error ±0.5%. Following the conservative approach the least value of the two flow meters is taken into consideration at each data reading. If the readings of the flow meters differ by greater than twice their claimed accuracy then measures are taken to remedy the fault. Flow meters shall be calibrated in compliance with the requirements of the Federal Agency for Technical Control and Metrology. The zero check on the flow meters shall be conducted every week. If the zero check indicates that the flow meter is not stable, an immediate calibration of the flow meter shall be undertaken.
	Low uncertainty level Measured by two down-the-line mass flow meters. Instrument error ±0,5%. Readings are automatically collected, stored, processed and protected from any corrections by APCS. APCS should automatically calculate the conservative value by taking the least value of the two mass flow meters at each data reading. The daily reports with corresponding accumulated data from APCS should be archived in electronic form. The data should be verified monthly and the reports with corresponding verified data should be archived in paper form. Mass flow meters shall be calibrated in compliance with the requirements of the Federal Agency for Technical Control and Metrology. The zero check on the flow meters shall be conducted every week. If the zero check indicates that the flow meter is not stable, an immediate calibration of the flow meter shall be undertaken. If the readings of the mass flow meters differ by greater than twice their claimed accuracy then measures are taken to remedy the fault.
	Clarification: The more detail description is provided
Revision 27	**Registered PDD / Intended deviation / Explanation and Justification**
D.2. Quality control (QC) and quality assurance (QA) procedures undertaken for	Low uncertainty level Cross-checked with the previous chromatograph analysis. Frequency of recalibration is in compliance with the requirements of the Federal Agency for Technical Control and Metrology.

data monitored ID 2. C_HFC23_y ID 5. $C\_ND\_HFC23_y$ ID 8. $C\_G\_HFC23_y$	Low uncertainty level Calculated by approved method (relative error - 5%) based on concentrations of sample's components measured by chromatograph daily. The measurements and calculation of mass content should be performed by laboratory personnel, documented in paper form and archived in electronic form. The results are to be verified. The data should be cross-checked with the previous data and summarized in the monthly reports. Chromatographs shall be calibrated in compliance with the requirements of the Federal Agency for Technical Control and Metrology: absolute calibration - 1 time per year, calibration measurement - 1 time per quarter.
	Clarification: The more detail description is provided
Revision 28	**Registered PDD / Intended deviation / Explanation and Justification**
D.2. Quality control (QC) and quality assurance (QA) procedures undertaken for data monitored ID 4. q_ND_y	Low uncertainty level Flow meter is subject to calibration once in 2 years. The accuracy of the equipment has little influence on accuracy of GHG emission reduction calculations.
	Low uncertainty level Measured by portable flow meter and calculated based on the calendar length of period (hours/period). To provide conservative estimate the shutdown time of the destruction unit is not included in calculation. The accuracy of the equipment and the method has little influence on accuracy of GHG emission reduction calculations. Portable flow meter is subject to regular calibration in compliance with the requirements of the Federal Agency for Technical Control and Metrology - once in 2 years.
	Clarification due to change of measurement method.
Revision 29	**Registered PDD / Intended deviation / Explanation and Justification**
D.2. Quality control (QC) and quality assurance (QA) procedures undertaken for data monitored ID 3.FC_y	Low uncertainty level Natural gas meter is checked once in 3 years.
	Low uncertainty level Measured by natural gas meter. The accuracy of the equipment and following calculation has little influence on accuracy of GHG emission reduction calculations. Gas meter is subject to regular calibration in compliance with the requirements of the Federal Agency for Technical Control and Metrology - once in 3 years.

	Clarification: The more detail description is provided
Revision 30	**Registered PDD / Intended deviation / Explanation and Justification**
D.2. Quality control (QC) and quality assurance (QA) procedures undertaken for data monitored ID 7. $q\_G\_HFC23_y$	Low uncertainty level Frequency of recalibration is in compliance with the requirements of the Federal Agency for Technical Control and Metrology.
	Low uncertainty level Measured by mass flow meter. Instrument error ±0,5%. Readings are automatically collected, stored, processed and protected from any corrections by APCS. The daily reports with corresponding accumulated data should be archived in electronic form. The data should be verified monthly and the reports with corresponding verified data should be archived in paper form. Mass flow meters shall be calibrated in compliance with the requirements of the Federal Agency for Technical Control and Metrology. The zero check on the mass flow meter shall be conducted on demand. If the zero check indicates that the mass flow meter is not stable, an immediate calibration of the mass flow meter shall be undertaken.
	Clarification: The more detail description is provided The more detail description is provided
Revision 31	**Registered PDD / Intended deviation / Explanation and Justification**
D.2. Quality control (QC) and quality assurance (QA) procedures undertaken for data monitored ID 6. S_HFC23_y ID 9. P_HCFC22_y	Low uncertainty level Cross-checked with production and accounting reports.
	Low uncertainty level Measured by level meters. The measurements should be documented and archived in paper form. The background data should be verified and summarized in the monthly reports. The monthly reports should be cross-checked with production and accounting reports. The equipment shall be calibrated in compliance with the requirements of the Federal Agency for Technical Control and Metrology.
	Clarification: The more detail description is provided
Revision 32	**Registered PDD / Intended deviation / Explanation and Justification**
D.2. Quality control (QC) and quality assurance (QA) procedures undertaken for	Medium uncertainty level Consumption standards are developed by the department of Chief Energy Engineer and Technical Department annually based on measured consumption and then calculated for each of the destroyed substances. Consumption standards are approved by the

data monitored	Chief Engineer of the plant.
ID 10.EC_y	Low uncertainty level Measured by meter. The equipment shall be calibrated in compliance with the requirements of the Federal Agency for Technical Control and Metrology. Electricity consumption standards for each of destroyed substances are calculated and approved by project operator at the end of the year based on the measured electricity consumption.
	Clarification: The more detail description is provided
Revision 33	**Registered PDD / Intended deviation / Explanation and Justification**
D.2. Quality control (QC) and quality assurance (Q_A) procedures undertaken for data monitored	Low uncertainty level Heat meter is checked once in 2 years.
ID 11. StC_y	Low uncertainty level Measured by heat meter. The equipment shall be calibrated in compliance with the requirements of the Federal Agency for Technical Control and Metrology - once in 2 years. Steam consumption standards for each of destroyed substances are calculated and approved by project operator at the end of the year based on the measured steam consumption.
	Clarification: The more detail description is provided
Revision 34	**Registered PDD / Intended deviation / Explanation and Justification**
D.3. Please describe the operational and management structure that the project operator will apply in implementing the monitoring plan	All input data is regularly collected (see Section D.1.). The Head of Technical Department and the Deputy Head of the Thermal waste destruction facility (Shop No. 27) of JSC Halogen are responsible for data submission and execution of reporting documentation under the project. Calculations of emission reductions will be prepared by specialists of Camco International at the end of every reporting year. All data will be stored at least for two years after the last ERU tranche under the project. Additional details of procedures for unit operation, maintenance and personnel training are described in Annex 4.
	The operational and management structure comprises Project operator and Holding company. The monitoring procedures are executed by the Project operator according to Organization standard 47-40-2010 (monitoring procedure) set forth by the Order of the General director. According to the Order all readings in line with the monitoring plan have to be recorded

	under an established procedures and persons responsible for data collection and storage appointed starting on 01.01.2008. The monitoring report is prepared by Project operator. The project execution is supervised by the Holding company Halopolymer.
	Clarification: 1. Operational and management structure is advanced as described in Organization standard for better monitoring process. There is no impact on the GHG reduction calculation

Variable	Month												Total
	01.11	02.11	03.11	04.11	05.11	06.11	07.11	08.11	09.11	10.11	11.11	12.11	
q_HFC23y (kg)	40 927,4	31 210,4	43 129,4										115 267
q_G_HFC 23y (kg)	41 008,6	31 261,3	43 217,8										115 488
q_NDy (м3)	3972215	3009224	3702681										10684120
C_HFC23y (%)	80,33	82,57	83,71										82,20
C_G_HFC 23y(%)	80,33	82,73	83,28										82,11
C_ND_HF C23y (мg/м^3)	1	1	1										1
S_HFC23y (т)	0	0	0										0
FCy (м^3)	21 488	18 660	18 923										59 071
ECy (MW/h)	87,380	66,634	92,081										246,095
StCy (GJ)	68,542	52,269	72,230										193,040

GHG CALCULATION

The project GHG emissions during 2011, t C02-e:

E_DPy = ND_HFC23y x GWP_HFC23y +FCy x EFf + Q_HFC23y x EFh	306
where:	
ND_HFC23y is the HFC23 not destroyed in the unit during 2011, t	0,011
GWP_HFC23y is the GWP of HFC23, tCO2e/t (constant - 11 700 tCO2e/t)	11700
FCy is the natural gas consumption during 2011, m3	59 071
EFf is the CO2 emission factor for natural gas combustion. According to calculation EFf = 0,002 tCO2e/m3	0,002
Q_HFC23y is the HFC23 supplied for destruction into the unit during 2011, t	94,749
EFh is the CO2 emissions factor for HFC23 destruction. According to PDD EFh = 0,62857 tCO2e/t	0,62857
ND_HFC23y =q_NDy x C_ND_HFC23y x 10-9	0,011
where:	
q_NDy is volume of gaseous emissions from destruction process during 2011, m3	10 684 120
C_ND_HFC23y is the average annual concentration of HFC23 in gaseous emissions from the unit during 2011, mg/m3	1,000
Q_ HFC23y =q_H FC23y x 10-3 x C_ H FC23y x 1 0-2	94,749
where:	
q_HFC23y is the HFC23 waste supplied for destruction during 2011, kg	115 267
C_HFC23y is the average annual concentration of HFC23 in HFC23 waste supplied for destruction during 2011, %	82,20

Baseline GHG emissions during 2011, t C02-e:

At first HFC23 leaks to the atmosphere within the project boundary are calculated according to actual data for 2011, t:

L_HFC23y = G_HFC23y - Q_HFC23y - S_HFC23y	0,078
where:	

G_HFC23y is the HFC23 generated during 2011, t
Q_HFC23y is the HFC23 supplied for destruction during 2011, t
S_HFC23y is the HFC23 recovered for sale during 2011, t

94,827
94,749
0,000

G_HFC23y = q_G_HFC23y x 10-3 x C_G_HFC23y x 10-2
Q_HFC23y =q_H FC23y x 10-3 x C_H FC23y x 10-2
where:
q_G_HFC23y is the HFC23 waste generated during 2011, kg
q_HFC23y is the HFC23 waste supplied for destruction during 2011, kg
C_G_HFC23y is the average annual concentration of HFC23 in HFC23 waste generated during 2011, %
C_HFC23y is the average annual concentration of HFC23 in HFC23 waste supplied for destruction during 2011, %

94,827
94,749
115 488
115 267
82,11
82,20

Baseline emission is calculated as follows:

BEy = Q_HFC23y x G WP_HFC23
where:
Q_HFC23y is the HFC23 supplied for destruction during 2011, t
GWP_HFC23y is the GWP of HFC23, tCO2e/t (constant - 11 700 tCO2e/t)

1 108 563
94,749
11700

Leakages due to grid electricity consumption during 2011, t C02-e:

Ly =ECy x EFco2,grid,y x 10-3 +StCy x EFst
where
ECy is electricity consumption by the thermal destruction unit during 2011,MWh
EFco2,grid,y is theCO2 emissions factor for grid electricity during 2011, kg CO2/MWh
StCy is the steam consumption by destruction during 2011, GJ
EFst is the CO2 emissions factor for steam consumption, tCO2e/GJ

147
246,095
542
193,040
0,07

According to Operational Guidelines for Project Design Documents of Joint Implementation Projects:

EFco2,grid,2011 = 542 kg CO2/MWh	542

Emission reductions during2011, t CO2-e:

ERy =BEy -E_DPy - Ly	1 108 110
where	
BEy is the baseline GHG emissions during 2011, t C02-e	1 108 563
E_DPy is the project GHG emissions during 2011, t C02-e	306
Ly is the leakages due to grid electricity consumption during 2011, t C02-e	147

#	Monitoring point	Measuring device	Manufacturer's number	Manufacturer	Year of issue	Calibration date	Next calibration date	Recalibration interval	Number of calibration certificate
1	HFC23 waste quantity supplied to destruction process	1 Mass flow meter PROMASS 83F15	9FC01E2020000	Endress+Hauser Flowtec AG, Germany	2007	20.12.2007	20.12.2011	4 years	9FC01E2020000/07
		2 Mass flow meter PROMASS 83F15	9B0C4402000	Endress+Hauser Flowtec AG, Germany	2007	10.12.2007	10.12.2011	4 years	9B0C4402000/07
		3 Mass flow meter PROMASS 83F15	9B0C4502000	Endress+Hauser Flowtec AG, Germany	2007	10.12.2007	10.12.2011	4 years	9B0C4502000/07
2	HFC23 mass content in HFC23 waste supplied to destruction process	Chromatograph "Cristallux-4000M"	692	OAO "Biomashpribor", Yoshkar-Ola		26.11.2010	26.11.2011	1 year	16/8290
		Chromatograph "Cristallux-4000M"	306	OAO "Biomashpribor", Yoshkar-Ola		26.05.2011	26.05.2012	1 year	16/4244
		Chromatograph "Tsvet -800"	31	OAO " Tsvet ", Dzerzhinsk, Nizhegorodskaya oblast.	2001	23.12.2010	23.12.2011	1 year	16/8691
3	Volume of gaseous effluent from the unit	Portable flow meter TESTO	01492092/801	NPO "ECO-INTEX", Moscow	2008	29.04.2011	29.04.2012	1 year	16/10359
4	HFC23 concentration in gaseous	Chromatograph LKhM-80	311	Plant "Manomer", Moscow	1987	23.12.2010	23.12.2011	1 year	16/10360

	effluents from the unit	Chromatograph "Cristallux-4000"	637	OAO "Biomashpribor", Yoshkar-Ola	2001	27.10.2010	27.10.2011	1 year	16/8421
6	Natural gas consumption by HFC23 destruction process	Flow meter consisting of							
		Standard diaphragm DKS-06-80-A/B-1;	2367	OAO "Halogen", Perm		IIIrd Quarter 2008	IIIrd Quarter. 2013	5 years	
		Differential pressure gage АИР-20-ДД	20-61893	OOO "Elemer", Zelenograd, Moscow oblast.	2008	12.05.2010	12.05.2012	2 years	
		Gas corrector SPG-762	1333	ZAO "Logika", Saint-Petersburg	2006	IIIrd Quarter 2010	III rd. 2014	4 years	

Заключение эксперта

по Обоснованию изменений к плану мониторинга проектно-технической документации
«Сжигание HFC-23 на предприятии ОАО «Галоген» на ОАО «Галополимер Пермь»

г. Санкт-Петербург 21 июня 2011 года

Касательно максимального объёмы хладона-22, произведённого в исторический период 2002-2004 годов

В Проектно-технической документации (ПТД) указаны количества Х-22, произведённые в 2002-2004 годах. Однако эти данные не являются точными, а, следовательно, они непрезентативны. В Обосновании указывается, что они были рассчитаны с использованием старых расходных норм, которые были определены на основании измерений, сделанных с помощью измерительных средств КИПиА, имеющих низкий класс точности и более высокую погрешность измерений. В 2004 году произошла замена измерительного оборудования, в том числе старых радарных уровнемеров, установленных на ёмкостях с Х-22 (класс точности 0.4, относительная погрешность +/-0,8%) новыми радарными уровнемерами VEGA (класс точности 0.1) и модулем МАС-Д-04 (класс точности 0.25, относительная погрешность +/- 0,3%). Старые весы на отгрузочной линии хладона-22 РП 3Ш (абсолютная погрешность +/- 5 кг) были заменены новой автоматизированной измерительной системой (абсолютная погрешность +/-2,5 кг).В результате этих нововведений повысились качество и точность измерений. Соответственно точность определения количества производства Х-22 также увеличилась, начиная с 2005 года, так как для его определения стали использоваться более точные расходные нормы фтористого водорода и хлороформа на единицу хладона 22, раеход хладона 22 на единицу мономера М-4. При пересчёте количеств Х-22, произведённого в 2002-2004 году, с использованием новых более точных норм, утверждённых в 2010 году, обнаружилась несходимость результатов (от -4,7% до 12,8%) по сравнению с *количествами Х-22, определёнными в ПТД по старым, менее точным, нормам за этот же период.* Следовательно, данные по количествам Х-22, произведённым в 2002-2004 годах согласно ПТД не являются точными и на этом основании данное ограничивающее условие должно быть устранено из мониторинга сокращений при определении выбросов парниковых газов по базовой линии.

***Вывод**: Эти доводы являются совершенно справедливыми, так как в процессе эксплуатации технической установки, при помощи средств измерения КИПиА постоянно отслеживается потребление сырья, а также выход готового продукта. Количество произведённого Х-22 можно отследить по следующей методике:*

Количество хладона 22 в незавершённом производстве (НЗП) + Количество М-4 (на производство фторопластов) х норму расхода Х-22/М-4 + количество товарного Х-22.Процесс получения хл-22 описывается уравнением:CHCl3 + 2HF ----- CHClF2 + 2HCl.

При этом количество фтористого водорода, хлороформа, хладона -22 НЗП, товарного Х-22 и М-4 определяется с использованием уровнемеров и расходомеров. Нормы расхода фтористого водорода и хлороформа на производство хладона 22, хладона-22 на мономер-4 устанавливаются по результатам замеров фтористого водорода, хлороформа, хладона и мономера-4 за предыдущий период.

По результатам мониторинга технологического процесса технологом цеха по итогам месяца составляется технический отчёт, в котором приводится фактическое потребление сырьевых ресурсов, их сравнение с плановыми и объяснение причин отклонений. Если в результате

применения более точных средств КИПиА отмечается изменение расхода сырья и выхода продукта, то производится корректировка расходных норм. Поэтому совершенно очевидно, что указанные расходные нормы, установленные в 2010 году, будут наиболее точными при определении производства Х-22 за любой предыдущий период, включая 2002-2004 годы.

Таким образом, количества Х-22, произведённые в 2002-2004 годах согласно ПТД являются неточными, так как определены с большой погрешностью. В этой связи использование этих показателей для определения ограничивающего условия, а именно максимального годового объёма Х-22, произведённого на ОАО «Галоген»» в период 2002-2004 годов является недопустимым.

<u>Касательно минимальной процентной доли выхода Х-23 на единицу Х-22 за 2002-2004 годы.</u>

В Обосновании указывается, что значения, представленные в ПТД, не являются обоснованными, так как невозможно определить из какой точки (или каких точек) происходил отбор проб для определенияW_b. Данный показатель можно определить по результатам анализа состава образующейся газовой смеси после реактора синтеза или на других стадиях технологического процесса. Поэтому, указанные выше цифры не являются репрезентативными.

В Обосновании указывается, что в качестве достоверного источника информации, который может представить обоснованные данные для определения доли образования w_b, является технические отчеты, составляемые технологом цеха. Усреднённые данные по составу Х-22 заносятся в технические отчёты из журналов хроматографического анализа. Такой контроль осуществляется для обеспечения требуемого качества Х-22. Контрольные производственные показатели, включая концентрацию Х-22, периодически регистрируются в данных журналах. Результат каждого отбора газа регистрируется и подписывается оператором с указанием даты, времени и позиции, где происходили измерения, включая концентрацию Х-23. Усреднение концентрации Х-23 производится с учётом времени работы реактора синтеза Х-22 и периодичности отбора проб. В конце каждого месяца обработанные результаты анализа, включая концентрацию Х-23 (минимальные, максимальные и средние значения) представляются оператором технологу цеха производства Х-22. Таким образом, усреднение значений концентраций Х-23 по итогам года предоставляет более точные значения W_b. Т.о., среднегодовые значения долей Х-23, обоснованные утверждёнными техническими отчётами являются фактической и пользующейся доверием информацией.

Далее в Обосновании приводится сравнение значений доли Х-23 на единицу Х-22, произведённого в 2002-2004 годах, полученных в результате усреднения фактических показателей из технических отчётов со значениями указанной доли за тот же период согласно ПТД. Данное сравнение показало значительное расхождение результатов: от 30% до 99%.

***Вывод** : Показатель доли выхода Х-23 из произведённого Х-22 можно определить по усреднённым результатам анализа состава образующейся смеси газа-сырца как после реактора синтеза, так и на других стадиях технологического процесса. В зависимости от места отбора проб результат анализа состава газа-сырца будет разный, так как в технологической схеме происходит последовательная очистка Х-22 от примесей.*

Из сказанного выше следует, что значения доли Х-23 ,приведённые в ПТД могли быть получены в результате усреднения отдельных результатов анализа состава газа-сырца, отобранных из каких-то неопределённых точек и поэтому не могут быть репрезентативными.

С другой стороны совершенно справедливым является довод, что технический отчёт технолога цеха, в котором выпускается Х-22, является достоверным источником информации, поскольку в нём регистрируются усреднённые данные измерений фактического состава сырца Х-22, включая концентрацию Х-23. При этом измерения производятся на основании отбора газа в различных точках реактора синтеза, и, таким образом, обеспечивается репрезентативность выборки. Эти действия прописываются внутризаводскими регламентами и являются вполне обоснованными и правильными.

Следовательно, средние значения доли Х-23 на единицу Х-22произведённые в 2002-2004 годах на ОАО «Галоген» в период 2002-2004 годов согласно ПТД не являются репрезентативными. В этой связи они также должны быть исключены из мониторинга сокращений для определения ограничивающего условия, каким является минимальная среднегодовая доля Х-23 на единицу, произведённого Х-22 в период 2002-2004 годов.

Особенно следует подчеркнуть, что в ПТД указывается, что ограничивающие условия вводятся, чтобы исключить возможные манипуляции, связанные с учетом количеств образующихся отходов. Однако как указывается в Обосновании производство хладона 22 на предприятии никоим образом не связано с манипуляциями, так как данная продукция производится исключительно для того, чтобы выполнить производственную программу в соответствии с обязательствами по поставке этого продукта покупателям, а также, чтобы обеспечить производство фторопластов. При этом необходимо добавить, что процесс образования хл-23 *является неконтролируемым и его содержание при производстве хладона-22 может достигать 3-8%.*

ЗАКЛЮЧЕНИЕ:

Ознакомившись с доводами, представленными в Обосновании, считаю что:

1. **Указанные выше ограничивающие условия не являются точными и репрезентативными для использования в мониторинге при определении выбросов базовой линии.**
2. **Подходы, выражающиеся в устранении данных ограничивающих условий из *мониторинга сокращений, являются вполне обоснованными.***
3. **Наиболее точным отражением реальной ситуации по выбросам базовой линии является прямой мониторинг выбросов Х-23, выражающийся в измерении фактических количеств отбросных газов, содержащих Х-23 и его концентрацию, подаваемых на деструкцию в проектную установку термогидролиза ОАО «Галополимер Пермь».**

Список литературы:

1. Проектно-техническая документация «Утилизация выбросов хладона-23 на предприятии ОАО «Галоген»».
2. Обоснование изменений план-мониторинга проектно-технической документации проекта «Утилизация выбросов хладона-23 на предприятии ОАО «Галоген».

Эксперт, доктор технических наук Д.Д. Молдавский

Дата: 21.06.2011

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На № от

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ул. Ласьвинская, д. 98

Уважаемый Павел Иванович!

Информируем, что Ваш инвестиционный проект «Утилизация выбросов хладона-23 на предприятии ОАО «Галоген» утвержден приказом Минэкономразвития России от 23 июля 2010 г. № 326 в соответствии с Положением о реализации статьи 6 Киотского протокола к Рамочной конвенции ООН об изменении климата, утвержденным постановлением Правительства Российской Федерации от 28 октября 2009 г. № 843 «О мерах по реализации статьи 6 Киотского протокола к Рамочной конвенции ООН об изменениях климата».

Приложение: на 3 л. в 1 экз.

Заместитель директора
Департамента государственного
регулирования тарифов,
инфраструктурных реформ и
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ОАО "Галоген"
09 АВГ 2010
Вх.№ 1636

МИНИСТЕРСТВО ЭКОНОМИЧЕСКОГО РАЗВИТИЯ РОССИЙСКОЙ ФЕДЕРАЦИИ
(МИНЭКОНОМРАЗВИТИЯ РОССИИ)

П Р И К А З

23 июля 2010 г. **Москва** **№** 326

Об утверждении перечня проектов, осуществляемых в соответствии со статьей 6 Киотского протокола к Рамочной конвенции ООН об изменении климата

В соответствии с пунктом 2 постановления Правительства Российской Федерации от 28 октября 2009 г. № 843 «О мерах по реализации статьи 6 Киотского протокола к Рамочной конвенции ООН об изменении климата» (Собрание законодательства Российской Федерации, 2009, № 44, ст. 5240) приказываю:

Утвердить прилагаемый перечень проектов, осуществляемых в соответствии со статьей 6 Киотского протокола к Рамочной конвенции ООН об изменении климата.

Министр Э.С. Набиуллина

Министерство экономического развития Российской Федерации
Департамент управления делами №3

Минэкономразвития России
Вх. № 326
от 23.07.2010 1л. +2л.

Утвержден
приказом Минэкономразвития России
от 23.07.2010 № 326

ПЕРЕЧЕНЬ
проектов, осуществляемых в соответствии со статьей 6 Киотского протокола к Рамочной конвенции ООН об изменении климата

1. Инвестиционный проект «Сбор газа на Самотлорском месторождении» (инвестор проекта - ОАО «Самотлорнефтегаз»).

2. Инвестиционный проект «Проект совместного осуществления на Еты-Пуровском месторождении» (инвестор проекта - ОАО «Газпромнефть»).

3. Инвестиционный проект «Утилизация попутного нефтяного газа на Комсомольском месторождении» (инвестор проекта - ОАО НК «Роснефть»).

4. Инвестиционный проект «Утилизация попутного нефтяного газа на Восточно-перевальном нефтяном месторождении» (инвестор проекта - ОАО «РИТЭК»).

5. Инвестиционный проект «Утилизация попутного нефтяного газа на Средне-Хулымском нефтяном месторождении» (инвестор проекта - ОАО «РИТЭК»).

6. Инвестиционный проект «Расширение Южно-Балыкского газоперерабатывающего завода» (первая фаза) (инвестор проекта - ОАО «СИБУР Холдинг»).

7. Инвестиционный проект «Реконструкция доменных печей № 5 и № 6 ОАО «Нижнетагильский металлургический комбинат» (инвестор проекта - ОАО «Нижнетагильский металлургический комбинат»).

8. Инвестиционный проект «Внедрение ресурсосберегающих технологий на ОАО «Уральская Сталь», г. Новотроицк, Россия» (инвестор проекта - ОАО «Уральская Сталь»).

9. Инвестиционный проект «Утилизация дегазационного метана в шахтах ОАО «СУЭК-Кузбасс» (инвестор проекта - ОАО «СУЭК-Кузбасс»).

10. Инвестиционный проект «Строительство ПГУ-400 на Шатурской ГРЭС, ОГК-4» (инвестор проекта - ОГК-4).

11. Инвестиционный проект «Повышение эффективности использования водных ресурсов на Братской ГЭС (БГС)» (инвестор проекта - ОАО «Иркутскэнерго»).

12. Инвестиционный проект «Перевод двух котлов Амурской ТЭЦ-1 с угля на природный газ с установкой экологически чистого оборудования» (инвестор проекта - Дальневосточная генерирующая компания).

13. Инвестиционный проект «Совместная утилизация выбросов хладона-23 и гексафторида серы на предприятии ООО «Завод полимеров КЧХК» (инвестор проекта - ООО «Завод полимеров КЧХК»).

14. Инвестиционный проект «Утилизация выбросов хладона-23 на предприятии ОАО «Галоген» (инвестор проекта - ООО «Галоген»).

15. Инвестиционный проект «Модернизация выпарного хозяйства филиала ОАО «Группа Илим» в г. Коряжме» (инвестор проекта - ОАО «Группа Илим»).

Копия верна. Архипова И.А.