

JOINT IMPLEMENTATION PROJECT

**«Modernization of Company Equipment by Change of Fuel Type from Residual
Oil to Natural Gas at the LTD «PFC»**

(the project name)

The fourth monitoring report covering the period from 01.01.2010 until 31.08.2010

Position of the head of organization,
institution or establishment compiling
the document

Director General of LLC «Center TEST»

(position)



(signature)

N.F. Kolesnikova

(full name of person)

(Seal place)

SEAL: Limited Liability Company

“Center TEST”.

Identification code 32349482,

Ukraine, Kyiv city

Position of the head of economic entity
owning the source to be used as the basis
for the joint implementation project

Director General of LTD «PFC»

(position)



(signature)

M.V. Novikov

(full name of person)

(Seal place)

SEAL: Limited Liability Company

“Pobuzhsky Ferronickel Works”.

Identification code 31076956,

Ukraine, Kyiv city

The city of Kyiv
December 2010

JI monitoring report form

Monitoring period: 01.01.2010 – 31.08.2010

Version: 04

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Section A. General information of project activity and monitoring

A.1. Title of the project activity

"Modernization of an enterprise regarding fuel switching from fuel oil to natural gas at PFC, LTD".

A.2. JI registration number

Projects ITL number is UA1000143.

A.3. Brief description of the project activity

The main project purpose is to reduce greenhouse gas (GHG) emission due to fuel switching from fuel oil to natural gas. GHG emission reduction can be achieved by modernization of a fuel system.

To fulfill this project the enterprise constructed a gas pipeline connected to the public gas transmission system, which provided use of natural gas instead of fuel oil for combustion in the respective production. Also, in order to increase efficiency of natural gas using the enterprise replaced gas burners.

Due to the absence of the project for production at the enterprise fuel oil was used as fuel, and the main greenhouse gas emissions from fuel combustion are CO₂ emissions. The proposed project allowed the enterprise to switch from oil fuel to another one – natural gas. Greenhouse gas emissions will be reduced at the expense of the fact that carbon content in fuel oil is much higher than in natural gas, and the lower combustion value of fuel oil is much higher compared to natural gas.

A.4. Monitoring period

Starting date: 01.01.2010

End date: 31.08.2010

A.5. Project activity methodologies

The methodology ACM0009 "Consolidated methodology for industrial fuel switching from coal or petroleum fuels to natural gas" (Version 3.2) was used for the baseline defining and development of the monitoring plan.

A.6. Status of implementation including the schedule of major project parts

Table 1

Activity	Starting date
Construction of the gas pipeline that connected to the public gas transmission system, which allowed to switch from oil fuel to natural gas	12 July 2005
Installation of redesigned gas burners	11 December 2008

Status of implementation is according to the PDD version 05.

A.7. Planned discrepancies and revision of registered PDD

There are no deviations from registered PDD.

The increasing of the amount of ERUs is supposed to be observed for the 2010 monitoring period comparing to the registered PDD. It is complicated to predict the final amount of ERUs for 2010 having just information for the first eight months of the year because the amount of NG consumed (one of the key monitoring parameters) is not equally distributed during the whole year. The difference can be as well explained by the record-breaking high temperature, which occurred during 2010 through the whole territory of Ukraine including Kirovograd region, which led to the increasing of PFC, LTD fuel system energy efficiency. Efficiency of the fuel system is one of the key monitoring parameters.

A.8. Planned discrepancies and revision of registered monitoring plan

The changes were provided to the monitoring plan considering the NCV estimation. “National Cadastre of Anthropogenic Emissions and Greenhouse Gas Absorption of Ukraine for 1990-2008” (from now on – “National Cadastre of Ukraine”) was used to estimate this parameter during previous monitoring periods but in order to increase level of accuracy data from SE “Ukrtransgas” and UMG “Cherkasytransgas”, which is gas provider for PFC, LTD, were used. Renewed version of the “National Cadastre of Ukraine” does not identify parameter of emission factor for the burning fuels, which is why for the estimation of this parameter the data from IPCC 1996 was taken in the part of choice of oxidation factor and “National Cadastre of Ukraine” in the part of choice of parameter of carbon content in the fuel.

A.9. Responsible personnel, who are obliged to develop and present monitoring report

PFC, LTD:

Victor Romanenko – Chief engineer

Section B. Key monitoring activities

B.1. Monitoring activity

Key monitoring activities:

- measurement of fuel consumption (natural gas) of the PFC LTD fuel system for the production needs;
- estimation of energy efficiency of the system working on the natural gas.

Natural gas consumption is measured directly with the help of gas flue meters. Gas flue meter is connected to the gas pipeline and is providing the measurement of natural gas consumption entering the system. The estimation of energy efficiency is performed on the basis of the meters data, passport data of the burners, and GOCT 21204.

B.2. Type of monitoring equipment

Measurement of natural gas consumption is performed by using turbine TZ/FLUXI gas meters, which are included in the list of public register of measurement devices of Ukraine # Y 373-02. Gas meters are subjected to the state periodic verification two years apart.

B.2.2. Table that presents information about measurement equipments (including producer, type, serial number, installation date, last verification date, uncertainty information, replacement need or alteration)

Corresponding data is presented in the Table 2.

Table 2

Measurement device	Producer	Measurement parameter	Type	Serial number	Uncertainty	Last verification date	Next verification date	Comment
Turbine gas meter	"Actaris Metering Systems", Germany	m ³	TZ/FLUXI	6459706001	Maximum relative allowable uncertainty 2%	16.03.2010	in 2 years	
Turbine gas meter	"Actaris Metering Systems", Germany	m ³	TZ/FLUXI	6459706002	Maximum relative allowable uncertainty 2%	26.08.2009	in 2 years	

B.2.3. Verification procedure

Gas meters are subjected to the state verification. Data of verification procedure is presented in the table 3.

Table 3

Parameter	Response
Measurement device (MD)	Turbine TZ/FLUXI gas meter
Calibration interval	2 years (according to the passport)
Verification methodology and procedure	Identified by SE " Ukrmetrteststandart "
Warranty assurance of MD	12 months from the date of setting into operation of MD, but no longer than 18 months from the on-sale date of MD
Responsible authority for verification and certification of MD	SE " Ukrmetrteststandart "

B.2.4. Third parties involved

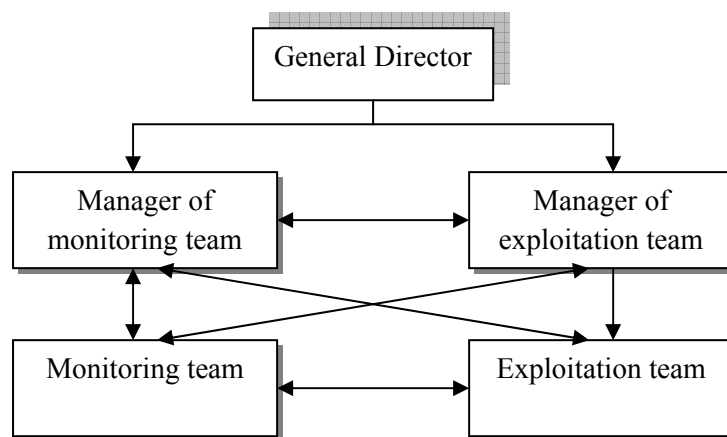
SE "Ukrmetrteststandart" is authorized to conduct of verification and calibration of the measurement devices.

SE “Western expert-technical center of the national research-scientific institute of the production and labor safety” performs the calculations of the energy efficiency of the system. SE Western expert-technical center of the national research-scientific institute of the production and labor safety” is authorized to perform this kind of work and posses all the required licenses.

Calculation of efficiency of the system working on fuel oil was performed by LTD “Ukr TEST”, which posses all required licenses.

B.3. Data collection (data collected while the whole monitoring period)

Management structure of monitoring is presented in the picture 1.



Picture 1- Management structure of monitoring and operation

Exploitation team is responsible to perform data measurement and data collection in compliance with measurement results. Exploitation team transfers measurement results to monitoring team for estimation of GHG emissions reduction. Monitoring team is also responsible to collect data that data that can not be measured but need to be monitored.

According to the measurement results, there was identified corresponding data that uses to estimate emissions reduction. Values of this data are presented in the table 4 in compliance with symbols identified in the PDD.

Table 4

Title	Symbol	Value and Data unit	
		Month	mln. m ³
Volume of natural gas consumed	FF _{project, NG, y}	January	9,263
		February	7,614
		March	5,544
		April	4,941
		May	6,889
		June	6,585
		July	8,254
		August	7,961
		Energy efficiency of the system working	ε _{NG}

on the natural gas		January	70,8
		February	73,5
		March	80,3
		April	81,5
		May	84,8
		June	86,3
		July	87,0
		August	84,3
Lower combustion temperature of natural gas	NCV _{NG}	Month	TG/mln. m ³
		January	33,658
		February	33,637
		March	33,708
		April	33,725
		May	33,762
		June	33,934
		July	33,783
		August	33,988

B.3.1. List of other parameters that uses to estimation

Other parameters that are used for estimation of emissions reduction have no need to be measured. The list of these parameters is presented in the table 5. Titles of the parameters are indicated in the table 5 according to the titles presented in the PDD.

Table 5

Title	Symbol	Value and Data unit	Source of data
CO ₂ equ emission factor for natural gas	EF _{NG, co2}	55,82 t CO ₂ /TJ	“National Cadastre of Ukraine” and IPCC, 1996
CO ₂ equ emission factor for fuel oil	EF _{BO, co2}	76,59 t CO ₂ /TJ	“National Cadastre of Ukraine” and IPCC, 1996
Energy efficiency of a system fired with fuel oil	ε _{BO}	61,2%	This value was estimated on the basis of statistics of system working that fired with fuel oil

B.3.2. Data of leakages

This section is not applicable to the project.

B.3.3. Environmental impacts

The proposed interference into the existing production scheme has a positive environmental impact owing to switching of PFC, LTD from fuel oil to natural gas and will correspondingly lead to greenhouse gas emissions reduction into the air.

Emissions reduction will occur as a result of realization of this project, namely: at the expense of the fact that carbon content in fuel oil is much higher than in natural gas, and lower calorific value of fuel oil is higher than in natural gas.

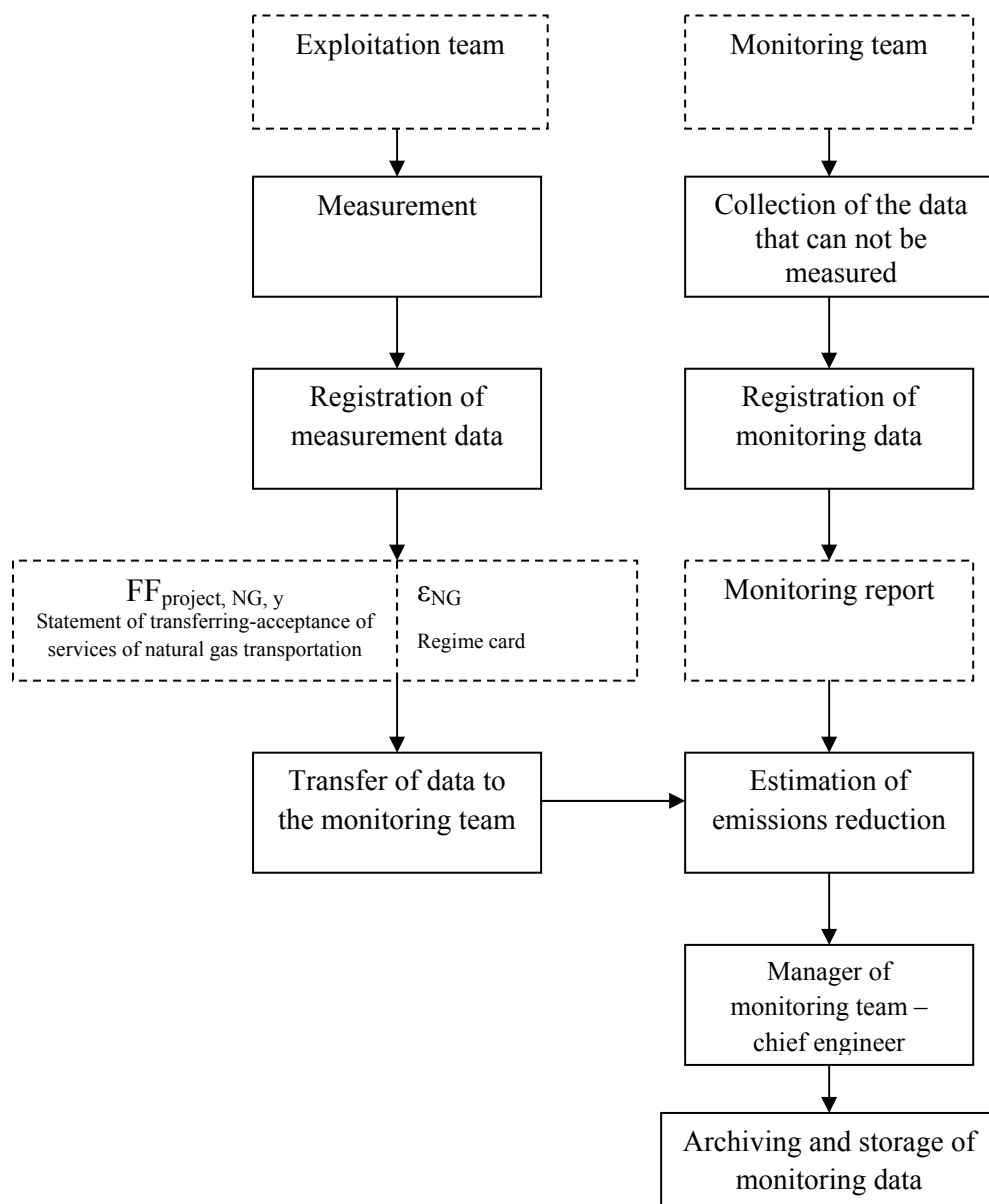
Emissions reduction, achieved as a result of implementation of this project, has environmental impact in Ukraine and does not impact greenhouse gas emissions abroad Ukraine.

Environment Impact Assessment (EIA) has been conducted for the proposed JI project. The environmental characteristics and impact evaluation in compliance with EIA has been presented in the PDD version 05. According to the EIA opinion, fuel switch on the enterprise will lead to the significant pollutant emissions reductions of the fuel system that will have positive effect on the population of the nearby area.

B.3.4. Data processing and data archiving

All monitoring data is required to be saved in a paper way. Measurement performance and data archiving is envisaged to the exploitation team. The measurement results are given to the monitoring team for the estimation of GHG emissions reductions. The monitoring team responsibilities are collection of the data that can not be measured, but need to be monitored. The Chief Engineer is responsible for preparation and archiving of monitoring reports.

In the picture 2 there is presented the scheme of data collection and data archiving of monitoring.



Picture 2 – The scheme of data collection and data archiving of monitoring

B.3.5. Registration of special cases and technological accidents

There were no registered special cases and technological accidents while the monitoring period.

Section C. Quality assurance and quality control measures

C.1. Registered procedures and management plan

C.1.1. Roles and responsibilities

PFC, LTD general director assigns the responsible personnel, who are obliged to provide exploitation and maintenance of the fuel system as well as providing stability and effectiveness of system work. These functions are as well foreseeing all necessary for monitoring data registration. Personnel are also responsible for maintaining optimal exploitation level.

Functions and responsibilities of monitoring team determined by the Order of General Director of PFC, LTD #294 dated 23.11.2009. Monitoring staff identified by the Order of General Director of PFC, LTD #300 dated 30.11.2009.

The fuel system performance monitoring group is headed by Chief Engineer of PFC, LTD. Monitoring is conducted in close contact with the exploitation team and include monitoring, as well as analysis and archiving of all monitoring data. Calculation of the emission reduction volume is also an obligation of the monitoring team. Periodical data on natural gas consumption is analyzed in respect of the respective registered factors provided by the exploitation team to confirm their consistency. In case of discrepancies between the data their origin may be established in cooperation with the exploitation team. If any discrepancy is detected in monitoring data, respective adjustment shall be made in the monitoring system of a respective factor or the monitoring system of the fuel system.

The Chief Engineer is responsible for preparation and archiving of monitoring reports. The General Director regularly analyses the consolidated monitoring data and respective documentation.

Measurement performance and measurement data archiving is envisaged to the exploitation team. The measurement results are given to the monitoring team for the estimation of emission reductions. The monitoring team responsibilities are collection of the data that can not be measured, but need to be monitored. Measurement results of natural gas consumption are registered as Statement of transferring-acceptance of services of natural gas transportation that signed by representatives of PFC, LTD and an enterprise that supplies natural gas. Estimation results of energy efficiency of the system working fired with natural gas are registered as a regime card.

Monitoring data is kept during all crediting period and for 2 years after the last estimation of emissions reduction units.

C.1.2. Training

Exploitation team of the PFC, LTD has completed the training of exploitation and performance of the corresponding warning measures of the fuel system.

C.2. Measures of internal audits and control

The staff of PFC, LTD is subjected to periodic verification of knowledge of labor protection and safety measures while working with the fuel system. Measurement devices that used for monitoring are subjected to the state periodic verification.

While using gas meter it is necessary to follow the requirements of exploitation identified in the passport of the meter. According to the passport, gas meters need not a special technical maintenance. In case of the gas meter need repair, it has to be sent to an enterprise that produce the meter (an address is presented in passport of the meter).

The chief metrologist of PFC, LTD is responsible for maintenance of gas meters and if necessary sending on time these meters to the repair. While the meter is being repaired, monitoring data of natural gas consumption is collected by the enterprise that supply of natural gas. The enterprise that supplies natural gas performs permanent measurement of amount of natural gas that is supplied. Due to this mechanism, the risk of absence of monitoring data for performance of emission reduction estimation is absent.

Section D. Estimation of greenhouse gas emissions reduction

D.1. Project emissions

Emissions under the project scenario are calculated using the following formula:

$$PE_y = FF_{\text{project, NG, y}} \cdot NCV_{\text{NG}} \cdot EF_{\text{NG, CO}_2}$$

where:

PE_y – annual emissions under the project scenario, tons of CO_2 equ;

$FF_{\text{project, NG, y}}$ – annual volume of flared natural gas, million m^3 ;

NCV_{NG} – lower combustion temperature of natural gas, TJ/million m^3 ;

$EF_{\text{NG, CO}_2}$ – CO_2 equ emission factor for natural gas, t CO_2 equ /TJ.

Monitoring data for reporting period are presented in the Tables 4 and 5 of the monitoring report.

Project emission reductions during monitoring period are presented in the Table 6.

Table 6

Month	Emissions for the project scenario, t CO_2 eq.
January	17 402
February	14 297
March	10 431
April	9 301
May	12 984
June	12 474
July	15 565
August	15 103
Total	107 557

According to the project scenario, emissions for reporting period were 107 557 t CO_2 eq.

D.2. Baseline emissions

Emissions under the baseline scenario are calculated using the following formula:

$$BE_y = FF_{\text{baseline, BO, y}} \cdot NCV_{\text{BO}} \cdot EF_{\text{BO, CO}_2}$$

where:

$$FF_{\text{baseline, BO, y}} = FF_{\text{project, NG, y}} \cdot \frac{NCV_{\text{NG}} \cdot \epsilon_{\text{NG}}}{NCV_{\text{BO}} \cdot \epsilon_{\text{BO}}}$$

where:

BE_y – annual baseline emissions, tons of CO_2 equ;

$FF_{\text{baseline, BO, y}}$ – annual volume of flared fuel oil in case of absence of the project, thousand tons;

NCV_{BO} – lower combustion temperature of fuel oil, TJ/thousand tons;

$EF_{\text{BO, CO}_2}$ – CO_2 equ emission factor for fuel oil, t CO_2 equ /TJ;

$FF_{\text{project, NG, y}}$ – annual volume of flared natural gas, million m^3 ;

NCV_{NG} – lower combustion temperature of natural gas, TJ/million m^3 ;

ϵ_{NG} – energy efficiency of a system fired with natural gas;

ϵ_{BO} – energy efficiency of a system fired with fuel oil.

Monitoring data for reporting period are presented in the Tables 4 and 5 of the monitoring report.

Project emission reductions during monitoring period are presented in the Table 7.

Table 7

Month	Emissions for the baseline scenario, t CO _{2eq.}
January	27 623
February	23 559
March	18 779
April	16 995
May	24 685
June	24 135
July	30 360
August	28 545
Total	194 681

According to the baseline scenario, emissions for reporting period were 194 681 t CO_{2 eq.}

D.3. Leakages

This section is not applicable for the project.

D.4. Emissions reduction for monitoring period

Emission reductions for the monitoring period are presented in the Table 8.

Table 8

Month	Emission reductions, t CO _{2eq.}
January	10 221
February	9 262
March	8 348
April	7 694
May	11 701
June	11 661
July	14 795
August	13 442
Total	87 124

Emissions reduction for monitoring period is 87 124 t CO_{2 eq.}