INITIAL AND FIRST PERIODIC ANNUAL JI MONITORING REPORT

Version 2.0

15th of November 2012

CONTENTS

SECTION A. General project activity and monitoring information

A.1 Title of the project activity:

"Rock Mass Processing of the Waste Heap with the Aim of Decreasing the Greenhouse Gases Emissions into the Atmosphere"

Sectoral scope: 8. Mining/mineral production

A.2. JI registration number:

Registration number will be assigned later.

A.3. Short description of the project activity:

Project "Rock Mass Processing of the Waste Heap with the Aim of Decreasing the Greenhouse Gases Emissions into the Atmosphere" provides implementation of a number of technical solutions on dismantling and further processing of rock mass of the waste heap, located in the urban type settlement Kalininskiy, Sverdlovsk district, Luhansk region, Ukraine. This heap was shaped by the former mine CCM "Mayak" and was closed in 1967.

This project involves the introduction of dry beneficiation method of rock mass of the waste heap to reduce greenhouse gas emissions resulting from spontaneous combustion of its flammable components. Prevention of spontaneous combustion of the waste heap will reduce the negative impact on the environment. So, according to the project scenario, coal extracted from the waste heaps will partially replace coal produced in the coal mines, thereby reducing fugitive methane emissions, as well as reducing the energy consumption required for coal mining. Besides, waste heaps occupy large areas that could be used in agriculture therefore waste heap processing will free up some land sites for future use in the farm.

Baseline scenario assumes that the problem of waste heaps combustion will not be effectively resolved, rock mass of waste heaps will undergo self-ignition until all volume of coal contained in it does not burn. Continuation of existing situation will lead to large emissions of greenhouse gases in the atmosphere and to the general pollution of the ecosystem of the region.

Decision on implementation of the project, which provides recultivation of the waste heap of the former mine of CCM "Mayak" with the aim of reducing GHG emissions, was made in early 2007. During 2007 agreement with contractors, who will provide transportation services, was signed, and lease agreement was concluded for complex of rock mass processing. Starting date of the project is February 2, 2008, when operation of beneficiation installation began.

A.4. Monitoring period:

- Monitoring period starting date: 01/02/2008
- Monitoring period closing date: 30/09/2012[1]

A.5. Methodology applied to the project activity (incl. version number):

Specific approach of JI projects is used for the monitoring of emission reductions.

A.5.1. Baseline methodology:

Coal extraction from the waste heaps will prevent greenhouse gas (GHG) emissions into the atmosphere as if in the case of spontaneous burning and will produce additional amount of coal instead of its mining. Waste heaps are frequently spontaneously igniting and burning, causing emissions of hazardous substances and green-house gases. The fraction of coal in the waste heaps can be as high as 28-32%[2], so the risk of spontaneous self-heating and burning is very high. The survey[3] shows that 78% of waste heaps in the Luhansk Region are, or have been burning at some point in time. If a waste heap has started burning, even if the fire is extinguished, it will continue burning after a while unless the fire is extinguished regularly. Burning waste heaps in Ukraine are very often not taken care of properly, especially when there is no immediate danger to population and property, i.e. if the waste heap is

[1] Both days are included in the monitoring period.

[2] *Geology of Coal Fires: Case Studies from Around the World,* Glenn B. Stracher, Geological Society of America, 2007, p. 47

[3] *Analysis on the fire risk of Luhansk Region's waste heaps*, Scientific Research Institute "Respirator", Donetsk, 2010

located at a considerable distance from a populated area, or is at the early stages of self-heating. The monitoring of the waste heaps condition is not done on a systematic and timely basis and information is frequently missing. The only way to prevent a waste heap from burning is to extract all the combustible matter, which is generally residual coal from the mining process. This project will reduce the emissions by extracting coal from the waste heap matter and using the remaining rock for land engineering.

Coal extracted from the waste heaps will substitute the coal from the mines and will be used mainly for energy production purposes at coal-fired power plants. Coal mining is a source of the methane fugitive emissions. Therefore, the project activity will reduce methane emissions by reducing the amount of coal required to be mined.

Baseline emissions come from two major sources:

1) Carbon dioxide emissions that occur during combustion of energy coal. These are calculated as stationary combustion emissions from coal in the equivalent of the amount of coal that is extracted from the waste heaps in the project scenario. This emission source is also present in the project scenario and the emissions are assumed to be equal in both project and baseline scenarios. Therefore, this emission source is not included into calculations.
2) Carbon dioxide emissions from burning waste heaps. These are calculated as stationary combustion emissions from coal in the equivalent of the amount of coal that is extracted from the waste heaps in the project scenario, adjusted by the probability of a waste heap burning at any point in time. As the baseline suggests that the current situation is preserved regarding the waste heaps burning and the waste heaps in question are at risk of burning, it is assumed that actual burning will occur. The correction factor is applied in order to address the uncertainty of the waste heaps burning process. This factor is defined on the basis of the survey of all the waste heaps in the area providing a ratio of waste heaps that are or have been burning at any point in time to all existing waste heaps.

Leakage is the net change of anthropogenic emissions by sources and/or removals by sinks of GHGs which is done outside the project boundary, and that can be measured and is directly attributable to the JI project.

This project will result in a net change in of anthropogenic emissions by sources and/or removals by sinks of GHGs come from two sources:

- Leakages caused by fugitive methane emissions during coal production in coal mines;
- Leakages related to electricity consumption from the grid of Ukraine during coal production in the mine.

In the baseline scenario coal production by mining method is implemented (underground coal mines), while *fugitive emissions of coal mine methane* appear. In the project scenario, additional amount of thermal coal is extracted, using dry method of rock mass beneficiation of the waste heap, which otherwise would be burned. Therefore, coal produced by the project activity substitutes the coal would have been otherwise mined in the baseline scenario that would cause fugitive methane emissions. Thus, coal extraction from the waste heap will cause methane emissions.

Electricity consumption and related with this greenhouse gas emissions during waste heap dismantling will be included in the calculation of the project emissions. *Carbon dioxide emissions as a result of electricity consumption,* during coal mining in the amount that equals to the project amount of coal, is leakage that can be taken into account on the basis of State Statistics Committee[4] about the specific electricity consumption during coal production in the mines of Ukraine in the relevant year. Data in this link indicates that the specific level of electricity consumption during coal mining is higher than the specific electricity consumption from grid in the project scenario.

As reliable national data on fugitive CH_4 emissions associated with the production of coal are available, project participants used this data to calculate the amount of fugitive CH_4 emission.

[4] http://www.ukrstat.gov.ua/

A.5.2. Monitoring methodology:

JI specific approach was developed for this project in line with the JI Guidance on Criteria for Baseline Setting and Monitoring, Version 03. The resulting Monitoring Plan was determined as part of the determination process. The resulting Monitoring plan was agreed in the determination process.

Emission reductions as a result of the implementation of this project will come from three major sources:

- Elimination of carbon dioxide emissions sources from self-heating of the waste heap by mining coal from it;
- Reduction of the fugitive methane emissions volume because of coal mining by substitution of the coal from the mine to the coal extracted from the waste heap under the project implementation;
- Reduction of energy consumption during waste heap dismantling compared to energy consumption during coal mining.

The following parameters are monitored:

1. **Additional electricity consumed as a result of the project activity in the relevant period *y***

   For measurement of this parameter data of the company commercial is used – monthly bills for electricity from company-electricity supplier. This parameter is recorded using special electric energy meter. Meter is placed immediately after current transformers on the site of project implementation. This meter registers all electricity consumed in framework of the project as access to the electricity supply is carried out only through it. Indications are used for commercial accounts with the company-electricity supplier. Regular cross-checks with the energy supply company are performed. Monthly and annual reports are based on the monthly bills.

2. **Amount of diesel fuel burned as a result of the project activity in the relevant period *y***

   For the metering of this parameter the commercial data of the company is used. Receipts and other accounting data are used in order to confirm the consumed amount of fuel. Only the fuel consumed by the project is taken into account. During the project activity diesel fuel is consumed only by the project transport: trucks and bulldozers. Data on the amount of the consumed fuel come from the accounting records with units of measurement – litres, for monitoring purposes unit of measurement for amount of this fuel are converted into tonnes using the density of 0.85 kg/l [5]. Regular cross-checks with the suppliers are carried out. The monthly and annual reports are based on these data.

3. **Amount of sorted fraction containing coal (0-75mm), which was extracted from the waste heap and separated from the rock as a result of the project activity in the relevant period *y***

   For the metering of this parameter the commercial data of the company is used. To confirm the amount of produced coal acceptance certificates of coal products and other documents from buyers are used. For calculating GHG emissions, monitoring of this parameter is carried out according to the amount of shipped products to the buyer. Weighing is done at the industrial site of Central Concentrating Mill "Mayak" using special automobile scales. For providing full control over this parameter, regular cross-checks with purchasers of coal products are done. At the end of the month monthly technical report is prepared on its basis annual reports are prepared. Information on the volume of production of ROM coal is stored in paper and electronic forms.

4. **Ash and water content extracted as a result of the project activity fraction containing coal (0-75mm) in relevant period *y***

   These parameters are provided based on the conclusions of independent laboratory that conducts regular periodic analysis of samples of extracted from the waste heap coal. Key indicators of the coal quality are the calorific value, ash content, water content and sulphur content. In the conclusions of laboratory there is clear and transparent information on the number of coal party that is shipped, indicators of ash and water

[5] GOST 4840-2007 Diesel fuel. Specifications. The density is taken as average value between the two types of diesel fuel: summer and winter (data from Table 1). Values are converted from kg/m^3 into kg/l.

content. Analysis of extracted coal is implemented 3 times a month. Also research of extracted coal samples may be held at the request of the consumer in contrast to established internal regulations. Results of laboratory studies are stored in paper and electronic forms. If the data on the average ash content of sorted fraction and average water content of sorted fraction, extracted from the heap in period y is not available to the developer, or is irregular with a high level of uncertainty, they are taken equal to the corresponding general Ukrainian standards. If necessary, the analysis of coal samples can be made at the request of the buyer.

A.6. Status of implementation including time table for major project parts:

Decisions on JI project under the Kyoto Protocol, which is aimed at processing rock mass of the waste heap with the aim of reducing GHG emissions in the atmosphere, was made on February 2, 2007. This date is reflected in order No. 14 dated 02/02/2007. The starting date of the investment phase of the project is October 29, 2007, when lease agreement No. 10-69/2007 of concentrating complex for processing rock mass of waste heap was signed. The date of the project investment phase end is the date of signing the contract No. 1007-123 dated January, 25 2008 on recultivation of waste heap. All preparatory works have passed before this time, including precommissioning procedures of the project equipment. Date of commissioning of installation for waste heaps processing is February, 01 2008. Plan of project implementation is shown below:

Table 1 – Project implementation plan.

Activity	Date in the PDD	Actual Date
Decision-making	02/02/2007	02/02/2007
Beginning of investment project phase	29/10/2007	29/10/2007
End of investment project phase	25/01/2008	25/01/2008
Start of the project activity	01/02/2008	01/02/2008

Letters of Approval were issued by both Parties involved mentioned in the PDD:
Letter of Approval from SEIA of Ukraine № 3406/23/7 dated 13/11/2012.
Letter of Approval from Ministry environment of the Estonia No. № 12-1/8543 dated 12/10/2012.

A.7. Intended deviations or revisions to the registered PDD:

There are no deviations to the PDD. This JI project is made publicly available on the UNFCCC website: http://ji.unfccc.int/JIITLProject/DB/75DO5BSWUJIY2GHD8D4XEX5PAIKOUT/details.

A.8. Intended deviations or revisions to the Monitoring plan:

There are no deviations to the monitoring plan.

A.9. Changes since last verification:

Not applicable.

A.10. Person(s) responsible for the preparation and submission of the monitoring report:

"REMSTROYPROEKT 2002" LLC:

- Zhdanov Serhiy Petrovych, Director.

SECTION B. Key monitoring activities

For the monitoring period stated in A.4. the following parameters have to be collected and registered:

1. **Additional electricity consumed as a result of the project activity in the relevant period *y***

   For measurement of this parameter data of the company commercial is used – monthly bills for electricity from company-electricity supplier. This parameter is recorded using special electric energy meter. Meter is placed immediately after current transformers on the site of project implementation. This meter registers all electricity consumed in framework of the project as access to the electricity supply is carried out only through it. Indications are used for commercial accounts with the company-electricity supplier. Regular cross-checks with the energy supply company are performed. Monthly and annual reports are based on the monthly bills.

2. **Amount of diesel fuel burned as a result of the project activity in the relevant period *y***

   For the metering of this parameter the commercial data of the company is used. Receipts and other accounting data are used in order to confirm the consumed amount of fuel. Only the fuel consumed by the project is taken into account. During the project activity diesel fuel is consumed only by the project transport: trucks and bulldozers. Data on the amount of the consumed fuel come from the accounting records with units of measurement – litres, for monitoring purposes unit of measurement for amount of this fuel are converted into tonnes using the density of 0.85 kg/l. Regular cross-checks with the suppliers are carried out. The monthly and annual reports are based on these data.

3. **Amount of sorted fraction containing coal (0-75mm), which was extracted from the waste heap and separated from the rock as a result of the project activity in the relevant period *y***

   For the metering of this parameter the commercial data of the company is used. To confirm the amount of produced coal acceptance certificates of coal products and other documents from buyers are used. For calculating GHG emissions, monitoring of this parameter is carried out according to the amount of shipped products to the buyer. Weighing is done at the industrial site of Central Concentrating Mill "Mayak" using special automobile scales. Sorted coal containing fraction is shipped to warehouse of finished products, from where it is loaded to transport by using special equipment and transferred to consumer. Warehousing coal will not lead to self-ignition and subsequent burning, because shipping coal is a continuous process without long delays. So that coal theoretically had the opportunity to spontaneous combustion, prolonged storage and accumulation of heap of finished products are needed, the project provides constant sales market of coal production, so the warehouse serves as a small buffer between producer and consumer. For providing full control over this parameter, regular cross-checks with purchasers of coal products are done. At the end of the month monthly technical report is prepared on its basis annual reports are prepared. Information on the volume of production of ROM coal is stored in paper and electronic forms.

4. **Ash and water content extracted as a result of the project activity fraction containing coal (0-75mm) in relevant period *y***

   These parameters are provided based on the conclusions of independent laboratory that conducts regular periodic analysis of samples of extracted from the waste heap coal. Key indicators of the coal quality are the calorific value, ash content, water content and sulphur content. In the conclusions of laboratory there is clear and transparent information on the number of coal party that is shipped, indicators of ash and water content. Analysis of extracted coal is implemented 3 times a month. Also research of extracted coal samples may be held at the request of the consumer in contrast to established internal regulations. Results of laboratory studies are stored in paper and electronic forms. If the data on the average ash content of sorted fraction and average water content of sorted fraction, extracted from the heap in period y is not available to the developer, or is irregular with a high level of uncertainty, they are taken equal to the corresponding general Ukrainian standards. If necessary, the analysis of coal samples can be made at the request of the buyer.

B.1. Monitoring equipment types

1. Electricity meter "Actaris SL7000 Smart"
2. Automobile scales "VTA-60"

B.1.2. Table providing information on the equipment used (incl. manufacturer, type, serial number, date of installation, information to specific uncertainty, need for changes and replacements):

Table 2 – Equipment used for monitoring activities

ID	Parameter	Measuring instrument	Unit	Manufacturer	Type	Serial number	Accuracy class	Date of installation
EL1	Electricity consumed	Electricity meter "Actaris SL7000 Smart"	kWh	Actaris[6]	Multifunction electronic electricity meter of V071 type	36128107	0,2s	4th quarter of 2007
W	Coal amount	Automobile scales "VTA-60"	t	Ukrestmarkinvest[7]	Strain- gauge automobile scales	142	20 kg	25/12/2007

Basic chart of metering points is provided in Annex 2.

Calibration of the metering devices and equipment has been conducted on a periodic basis according to the procedures of the Host Party.

During the monitoring period calibration was not performed for the electricity meter "**Actaris SL7000 Smart**" (ID EL1):

- Last calibration was held by manufacturer in the 4th quarter of 2007. 14/07/2005. The calibration interval exceeds the monitoring period (see section B.1.3). Calibration confirmed that the measurements, provided by the device, are valid.

During the monitoring period calibration has been performed for the automobile scales **"VTA-60"** (ID W):

- Calibration was conducted in accordance with the technical regulations of weights by the following chronology: 25/12/2007, 25/12/2008, 25/12/2009, 25/12.2010. Calibrations confirmed that the measurements provided by the device are valid.
- Last calibration was done on 25/12/2011. Calibration confirmed that the measurements, provided by the device, are valid.
- Next calibration to be performed not later than December 2012.

Private Enterprise "Production and Commercial Firm "Energo Max" performed installation and connection of electricity meters based on the contract concluded between the parties.

Since the beginning of operation of complex for waste heap processing, project equipment has not changed. All technical characteristics of beneficiation complex meet relevant technical documentation. During monitoring period only routine preventive maintenance of existing project equipment were performed.

Calibration of equipment will be implemented in accordance with the legislation of the host party – State Standard of Ukraine DSTU 2708:2006 "Metrology. Calibration of measuring instruments. The organization and procedure"[8].

B.1.3. Calibration procedures:

For electricity meter:

Table 3 – Calibration procedures for electricity meter

QA/QC procedures	Body responsible for calibration and certification
Calibration interval for the electricity meter "Actaris SL7000 Smart" is six years.	Calibration will be performed by the authorized

[6] http://www.actaris.com.ua/rus/katalog/schetchik-Actaris-SL7000

[7] http://vesi.dn.ua/2011/11/автомобильные-весы/

[8] http://www.metrology.in.ua/downloads/gost/DSTU2708_2006.pdf

Regular cross-checks with the electricity supply company.	representatives of the State Metrological System of Ukraine

For scales**:**

Table 4 – Calibration procedures for scales

QA/QC procedures	Body responsible for calibration and certification
Calibration interval for automobile scales "VTA-60" is one year. Regular cross-checks with the customers.	Calibration will be performed by the authorized representatives of the State Metrological System of Ukraine.

B.1.4. Involvement of Third Parties:

Private Enterprise "Production and Commercial Firm "Energo Max" – installation and connection of electricity meters.

Private Enterprise "Continent" – analysis of coal products samples.

B.2. Data collection (accumulated data for the whole monitoring period):

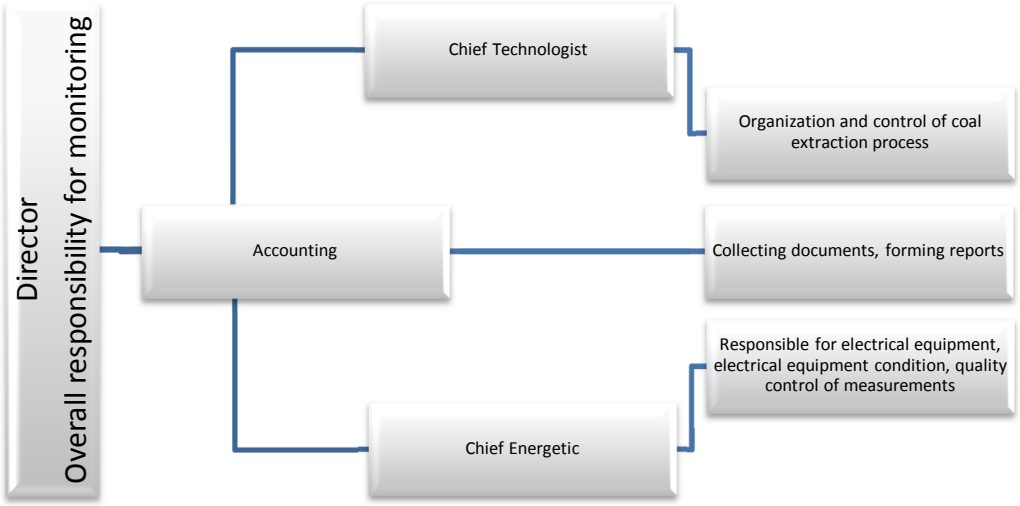

Figure 1 – Data flow scheme

B.2.1. List of fixed default values and ex-ante emission factors:

Table 5 – Fixed parameters

Data / Parameter	*Data unit*	*Description*	*Data Source*	*Value*
GWP_{CH4}	тCO2e./т CH4	Global warming potential of methane	IPCC Second Assessment Report[9]	21
ρ_{CH4}	t/m^3	Methane density	2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2: Energy, Chapter 4: Fugitive Emissions, Page 4.12[10]. Value was converted from converted Gg·m^{-3} to t/m^3.IPCC default value under standard physical conditions (t=293,15 K; p=101,2325 kPa)	0.00067
p_{WHB}	dimensionless unit	Correction factor, determining the probability of spontaneous combustion of the waste heap	Report on the fire risk of Luhansk Region's waste heaps, Scientific Research Institute "Respirator", Donetsk, 2012	0.78
$EF_{CH_4,CM}$	m^3/t	Fugitive methane emissions factor during coal mines operation	National Inventory Report of Ukraine 1990-2010, p. 90	25.67
$NCV_{Coal,y}$	TJ/kt	Net calorific value of coal in year *y*	National Inventory Report of Ukraine[11] 1990-2010 p. 456, 462, 468 (1.A.1.a – Public Electricity and Heat Production)	2008 – 21.5 2009 – 21.8 2010 – 21.6 2011 – 21.6 2012 – 21.6
$OXID_{Coal,y}$	ratio	Carbon oxidation factor of coal in year *y*	National Inventory Report of Ukraine 1990-2010 p. 459, 465, 471 (1.A.1.a – Public Electricity and Heat Production)	2008 – 0.963 2009 – 0.963 2010 – 0.962 2011 – 0.962 2012 – 0.962
$k^C_{Coal,y}$	t C/TJ	Carbon content of coal in year *y*	National Inventory Report of Ukraine 1990-2010 p. 458, 464, 470 (1.A.1.a – Public Electricity and Heat Production)	2008 – 25.95 2009 – 25.97 2010 – 25.99 2011 – 25.99 2012 – 25.99
$A_{coal,y}$	%	Average ash content of thermal coal extracted in Luhansk region, Ukraine	Guide of quality, volume of coal production and enrichment products in 2008-2010, Ministry of Coal Industry of Ukraine, State Committee of Ukraine, Luhansk 2010 (see Annex 4). Indicators for thermal coal.	2008 – 37.20 2009 – 38.40 2010 – 38.10 2011 – 38.10 2012 – 38.10
$W_{coal,y}$	%	Average water content of thermal coal extracted in Luhansk region, Ukraine	Guide of quality, volume of coal production and enrichment products in 2008-2010, Ministry	2008 – 7.2 2009 – 7.4 2010 – 7.4

[9] http://www.ipcc.ch/ipccreports/sar/wg_I/ipcc_sar_wg_I_full_report.pdf Page 22.

[10] http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_4_Ch4_Fugitive_Emissions.pdf

[11] http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/5888.php

			of Coal Industry of Ukraine, State Committee of Ukraine, Luhansk 2010 (see Annex 4). Indicators for thermal coal.	2011 – 7.4 2012 – 7.4
$N^{e}_{coal,y}$	MWh/t	Average consumption of electricity per tonne of extracted coal in Ukraine in year *y*	State Statistics Service of Ukraine. Fuel and energy resources of Ukraine[12], Statistical Yearbook, Kyiv 2009 (see Annex 5)	2008 – 0.0878 2009 – 0.0905 2010 – 0.0926 2011 – 0.0842 2012 – 0.0842
$NCV_{diesel,y}$	TJ/kt	Net calorific value of diesel fuel in year *y*	National Inventory Report of Ukraine 1990-2010 p. 473[13],476, 479 (value for mobile combustion, road transport)	2008 – 42.2 2009 – 42.2 2010 – 42.2 2011 – 42.2 2012 – 42.2
$OXID_{diesel,y}$	ratio	Carbon oxidation factor of diesel fuel in period *y*	National Inventory Report of Ukraine 1990-2010 p. 475, 478, 481 (value for mobile combustion, road transport)	2008 – 0.99 2009 – 0.99 2010 – 0.99 2011 – 0.99 2012 – 0.99
$k^{C}_{diesel,y}$	t C/TJ	Carbon content of diesel fuel in period *y*	National Inventory Report of Ukraine 1990-2010 p. 474, 477, 480 (value for mobile combustion, road transport)	2008 – 20.20 2009 – 20.20 2010 – 20.20 2011 – 20.20 2012 – 20.20
$EF_{grid,y}$	tCO_2/MWh	Specific indirect carbon dioxide emissions during the consumption of electric energy by the 2nd class electricity consumers according to Procedure for determining consumers' classes.	National Environmental Investment Agency Orders: No. 62 dated 15.04.2011 for 2008[14] No. 63 dated 15.04.2011 for 2009[15] No. 43 dated 28.03.2011 for 2010[16] No. 75 dated 12.05.2011 for 2011[17] (2012)	2008 – 1.219 2009 – 1.237 2010 – 1.225 2011 – 1.227 2012 – 1.227

CO_2 emission factor for electricity, consumed under the project activity in period y, accepted DFP and is based on existing data of power stations in accordance with "Calculation method of specific carbon dioxide emissions during electricity production at thermal power plants and during its consumption", State Environmental Investment Agency (SEIA), 2011[18].This method and specific carbon dioxide emissions resulting from its use were developed by DFP in Ukraine for use in JI projects. Assessment of specific carbon dioxide emissions for 2008, 2009, 2010 and 2011 is available[19]. It was stated that valid actual specific carbon dioxide emissions will be calculated and published each year for the previous year on the 1st of March. As for expected indicators in the project development document for each period of assessment, the value of specific carbon dioxide emissions for the relevant year are used. Actual value of specific carbon dioxide emissions is used if available to calculate emission reductions. If this value is not available, instead the last available value is used.

[12] http://www.ukrstat.gov.ua/druk/katalog/m-e_res/Pal_en_res.zip
[13] http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/5888.php
[14] http://www.neia.gov.ua/nature/doccatalog/document?id=127171
[15] http://www.neia.gov.ua/nature/doccatalog/document?id=127172
[16] http://www.neia.gov.ua/nature/doccatalog/document?id=126006
[17] http://www.neia.gov.ua/nature/doccatalog/document?id=127498
[18] http://www.neia.gov.ua/nature/doccatalog/document?id=125381
[19] http://www.neia.gov.ua/nature/doccatalog/document?id=127498

B.2.2. List of variables:

Project emissions variables to be monitored:

Table 6 – Monitored project emissions variables

ID (from PDD)	Parameter	Calculation method (Measured/Calculated/Estimated)	Unit	Comment	Meters used (as per B.1.2)	Data aggregation frequency
P-1	$EC_{PJ,y}$ - Additional electricity consumed as a result of the implementation of the project activity in the relevant period *y*	(M) Continuously measured by specialized meter. Summarized monthly by calculation. Records of the company-supplier and meter	MWh [2015]	The data will be archived and kept for two years after the last transfer of ERUs from the project.	EL_1	Data are aggregated monthly. Annual reports are prepared.
P-2	$FC_{PJ,Diesel,y}$ - Amount of diesel fuel burned as a result of the project activity in the relevant period *y*	(C) Calculated by summing the data on fuel consumption - expenditure invoices, write-off certificates, company records	l	The data will be archived and kept for two years after the last transfer of ERUs from the project.	-	Data are summarized monthly and annual reports are prepared.

Table 7 – Monitored baseline parameters variables

ID (from PDD)	Parameter	Calculation method (Measured/Calculated/Estimated)	Unit	Comment	Meters used (as per B.1.2)	Data aggregation frequency
B-1	$FR_{Coal,y}$ - Amount of sorted coal containing fraction (0-75mm), removed from the waste heap and separated from the rock as a result of project activity in period *y*	(M) Measured by weighing each separate batch of products. Then weighing results are aggregated in the calculation.	t	The data will be archived and kept for two years after the last transfer of ERUs from the project.	W	Daily measurements of shipped products. Monthly and annual reports are prepared
B-2	$A_{rock,y}$ - Ash content of extracted from the waste heap as a result of the project implementation coal-containing fraction (0-75mm),	(M/C) Independent laboratory studies	%	The data will be archived and kept for two years after the last transfer of ERUs from the project.	-	Studies of coal quality are performed 3 times a month

[20]Data from the meter and documents of energy supply company provided in kWh are converted into MWh for the monitoring purposes

	in period *y*					
B-3	$W_{rock,y}$ - Water content of sorted fraction (0-75mm), extracted from the waste heap as a result of the project implementation in period *y*	(M/C) Independent laboratory studies	%	The data will be archived and kept for two years after the last transfer of ERUs from the project.	-	Studies of coal quality are performed 3 times a month

B 2.3. Data concerning GHG emissions by sources of the project activity:

Table 8 – Data that were collected in the project scenario

Variables	***Description***	***Units***	***Values***				
			2008[21]	**2009**	**2010**	**2011**	**2012**[22]
$EC_{PJ,y}$	Additional electricity consumed as a result of the implementation of the project activity in the relevant period *y*	MWh	1 549.17	1 699.89	1 970.33	1 635.02	1 269.576
$FC_{PJ,Diesel,y}$	Amount of diesel fuel burned as a result of the project activity in the relevant period *y*[23]	l	101 497	111 372	124 787	105 595	82 304

B.2.4. Data concerning GHG emissions by sources of the baseline:

Table 9 – Data that were collected in the baseline scenario

Variable	***Description***	***Units***	***Value***				
			2008	**2009**	**2010**	**2011**	**2012**
$FR_{Coal,y}$	Amount of sorted coal containing fraction (0-75mm), removed from the waste heap and separated from the rock as a result of project activity in period *y*	t	106 839	117 234	131 355	113 543	87 557
$A_{rock,y}$	Ash content of extracted from the waste heap as a result of the	%	15.00	14.90	15.20	15.10	14.80

[21] Period of monitoring emissions reductions from 01/02/2008 to 31/12/2008. Hereinafter in this report, the values in the tables of 2012 relate to this period.

[22] Period of monitoring emissions reductions from 01/01/2012 to 30/09/2012. Hereinafter in this report, the values in the tables of 2012 relate to this period.

[23] In the internal company reports the amount of diesel fuel is reported in litres. To convert this amount into the tones the following formula is used: ***Diesel Fuel in Tones = (0.85* Diesel Fuel in Litres)/1000*** Where 0.85 stands for the density of diesel fuel in kg/l. Data are taken from DSTU 4840-2007 Diesel Fuel. Technical Requirements. Density of 0.85 kg/l is taken as an average between data for two suggested types of diesel: summer and winter (data from Table 1). Measurement units were converted from kg/m^3 to kg/l.

	project implementation coal-containing fraction (0-75mm), in period *y*						
$W_{rock,y}$	Water content of sorted fraction (0-75mm), extracted from the waste heap as a result of the project implementation in period *y*	%	9.20	9.10	9.80	9.90	9.00

B.2.5. Data concerning leakage:

Leakage is the net change of anthropogenic emissions by sources and/or removals by sinks of GHGs, which can occur outside the project boundary, and that can be measured and be directly attributable to the JI project.

This project will result in a net change in of anthropogenic emissions by sources and/or removals by sinks of GHGs come from two sources:

- Leakages caused by fugitive methane emissions during coal production in coal mines;
- Leakages related to electricity consumption from the grid of Ukraine during coal production in the mine.

In the baseline scenario coal production by mining method is implemented (underground coal mines), while *fugitive emissions of coal mine methane* appear. In the project scenario, additional amount of thermal coal is extracted, using dry method of rock mass beneficiation of the waste heap, which otherwise would be burned. Therefore, coal produced by the project activity substitutes the coal would have been otherwise mined in the baseline scenario that would cause fugitive methane emissions. Thus, coal extraction from the waste heap will cause methane emissions.

Electricity consumption and related with this greenhouse gas emissions during waste heap dismantling will be included in the calculation of the project emissions. *Carbon dioxide emissions as a result of electricity consumption,* during coal mining in the amount that equals to the project amount of coal, is leakage that can be taken into account on the basis of State Statistics Committee about the specific electricity consumption during coal production in the mines of Ukraine in the relevant year. Data in this link indicates that the specific level of electricity consumption during coal mining is higher than the specific electricity consumption from grid in the project scenario.

As reliable and accurate national data on fugitive CH_4 emissions associated with the production of coal are available, project participants used this data to calculate the amount of fugitive CH_4 emissions.

B.2.6. Data concerning environmental impacts:

Comprehensive EIA was performed in 2007 by PE PB "Ekoservice". This study was focused on the impact of waste heaps dismantling on the environment. According to Ukrainian laws and regulations, preparation of reports from Environmental Impact Assessment and positive conclusions of State Department of Ecology and Natural Resources makes procedure of environmental impact assessment.
Key findings of this EIA are summarized below:

- There is no impact on the water. Project activity of the point for processing of coal and rock mass will not affect the superficial and underground (ground) water because there are no sources of such pollution. Project equipment and beneficiation technology of coal and rock mass excludes the use of water. Water used for household needs on-site, is delivered by tank truck;
- Impact on atmospheric air: according to the proposed activity of the point for processing of coal and rock mass, coal dust and inorganic dust are emitted in atmospheric air; the dust contains SiO_2 70-20%. According to the results of calculation of scattering it is stated that on the boundary of sanitary protection zone of the point for processing bulk materials and on the boundary of the nearest residential buildings pollution of surface layer of the atmosphere by these types of dust as well as total dust content, taking into account background air pollution does not exceed the maximum permissible concentration;
- There is no impact on flora and fauna. Planned activity of the point for processing bulk materials will not lead to depletion and degradation of plant groups and fauna of surrounding area, to their accumulation of harmful substances;
- Noise impact is limited. The main source of noise will be at the minimum desired distance from residential

areas, mobile sources as for noise (traffic) provisions of local standards will be met;

- Impact on depths;
- Impact on landscapes: there is no impact as site of construction is located in industrial zone;
- Impact on society: the project activity does not render negative impact on public health because in the area of nearest residential buildings the level of pollution of surface layer of the atmosphere by project emissions is lower than the maximum permissible concentration, sound pressure level is lower that acceptable standards, there are no other sources of influence. All necessary measures are provided by working project, they are directed to protecting of staff from possible negative impact in accordance with sanitary standards.
- Transboundary impacts are not observed. There are no impacts that manifest within the area of any other country and that are caused by a proposed project activity which wholly physically originates within the area of Ukraine.

B.3. Data processing and archiving (incl. software used):

All data will be archived electronic and paper. Data acquisition and processing procedure for each parameter monitored:

1. **Additional electricity consumed as a result of the project activity in the relevant period y**

   This parameter is documented in the monthly invoices for the electric energy. The documents are collected every month by the responsible person. The documents obtained are collected by the accounting department on a monthly basis. The paper originals are bound into the special folder. Data on the electricity and identification parameter of each individual document are logged into the electronic register that is maintained at the head office of the company. The IT and data storage system containing this information at the head office has back-ups and allows for reliable data storage with virtually no chance of data loss. This log is printed and bound as a reference into the same folder with the original documents. At the same time the responsible person (as per section C.1.1) maintains an independent account of the monitoring data. At the end of the month the summarizing report is prepared containing the information on the monthly monitored data. This report is signed by the responsible person and is submitted to the director of the company. At the end of the year the annual summarizing report is prepared for all monitoring parameters containing monthly and annual figures. This report is submitted to the director of the company. These reports are kept in electronic form in the IT system of the company and in paper form with signatures of the responsible persons.

2. **Amount of diesel fuel combusted as a result of the project activity in the relevant period y**

   Consumption and write-off certificates and other accounting documents are used in order to confirm the amount of fuel consumed. The documents obtained are collected by the accounting department on a monthly basis. The paper originals are binded into the special folder. Data on fuel usage and identification parameter of each individual document are logged into the electronic register that is maintained at the head office of the company. Road transport, involved in the project activity, consumes diesel fuel to transport rock mass of the waste heap to the processing point. Drivers report to the management on the remaining fuel and mileage daily. The IT and data storage system containing this information at the head office has back-ups and allows for reliable data storage with virtually no chance of data loss. This log is printed and binded as a reference into the same folder with the original documents. At the same time the responsible person (as per section C.1.1) maintains an independent account of the monitoring data. At the end of the month the summarizing report is prepared containing the information on the monthly monitored data. This report is signed by the responsible person and is submitted to the director of the company. At the end of the year the annual summarizing report is prepared for all monitoring parameters containing monthly and annual figures. This report is submitted to the director of the company. These reports are kept in electronic form in the IT system of the company and in paper form with signatures of the responsible persons.

3. **Amount of sorted fraction containing coal (0-75mm), which was extracted from the waste heap and separated from the rock as a result of the project activity in the relevant period y**

   Acceptance certificates, quality certification of the product are used in order to confirm the amount of sorted coal-containing fraction extracted from the waste heap. The documents are collected for every production batch or shipment or for the group of shipments by the responsible person. The documents obtained are collected by the management of the company via accounting department on a monthly basis. The paper originals are binded into the special folder. Data on the quantity of coal and identification parameter of each individual document are logged into the electronic register that is maintained at the head office of the company. The IT and data storage system containing this information at the head office has back-ups and allows for reliable data storage with virtually no chance of data loss. This log is printed and binded as a reference into the same folder with the original documents. At the same time the responsible person (as per section C.1.1) maintains an independent account of the monitoring data. At the end of the month the summarizing report is prepared containing the information on the monthly monitored data. This report is signed by the responsible person and is submitted to the director of the company. At the end of the year the annual summarizing report is prepared for all monitoring parameters containing monthly and annual figures. This report is submitted to the director of the company. These reports are kept in electronic

form in the IT system of the company and in paper form with signatures of the responsible persons.

4. Ash and water content extracted as a result of the project activity fraction containing coal (0-75mm) in relevant period y

Qualitative indicators of coal that was extracted from the waste heap are included in the certificate of quality, which is submitted to the buyer together with acceptance certificate of coal products. In this certificate there is information on water and ash content of products certified by independent laboratory studies. Relevant studies of samples of coal production are performed periodically and the results are provided to the buyer at his request. Each party undergoes of coal analysis in the laboratory before shipment to the customer, and also mark and class of coal are indicated. These parameters are monitoring throughout the crediting period. For providing clear and transparent information independent authority was involved – PE "Continent", which will perform analysis of coal products. Quantitative indicators of water and ash content of coal are determined in accordance with the normative documents: GOST 4096-2002, GOST 27314-91, GOST11022-95 and others.

B.4. Special event log:

All special and exceptional events (critical equipment failures, reconstruction works, emergencies etc.) are documented by the special notes to the management of the company. No such events were observed during the monitoring period.
The nature of the project and underlying operations does not foresee any factors that can cause unintended emissions due to emergencies. Possible emergencies can have impact on the continuation of operations (shutdowns) which will lead to a decreased number of ERUs which is, in turn, conservative.

SECTION C. Quality assurance and quality control measures

C.1. Documented procedures and management plan:

C.1.1. Roles and responsibilities:

The general monitoring management is implemented by the Director of the company "REMSTROYPROEKT

2002" LLC through the supervision and coordination of the activities of his subordinates: Chief Technologist, Chief Energetic and Accounting department. The company has the following management scheme:

- Director of "REMSTROYPROEKT 2002" LLC is the main figure in management structure of the enterprise. He is responsible for the accuracy and reliability of all monitoring indicators, provides cross checks of certain parameters used for calculation of GHG emission reductions. Strategy of development and planning of the project depends on his direct actions.
- Chief Technologist is responsible for the technological operating modes of the project equipment, for safety at work, and he takes the decision to perform repair and maintenance work on complex for processing rock mass of the waste heap. He sends data on the volume of shipped coal products to the accounting department.
- Chief Energetic is responsible for providing electricity to the industrial area, and is also responsible for the timely involving representatives of State Metrology Service for calibration of the measuring device. He fixes all changes in electrical equipment and passes them to the accounting department.
- Accounting department is responsible for collecting, archiving, visualization of raw data on the consumption of diesel fuel and electricity consumption as well as the volume of shipped coal products. Accounting serves as a buffer between the industrial site and Director of the enterprise. This department is also responsible for conducting periodic studies of samples of coal extracted from the waste heap as a result of project activity. It generates monthly and annual technical reports and submits them to the Director of "REMSTROYPROEKT 2002" LLC.

Documents and reports on the data that are monitored will be archived and stored by the project participants. The following documents will be stored: primary documents for the accounting of monitored parameters in paper form; intermediate reports, orders and other monitoring documents in paper and electronic form; documents on measurement devices in paper and electronic form. These documents and other data monitored and required for determination and verification, as well as any other data that are relevant to the operation of the project will be kept for at least two years after the last transfer of ERUs to the buyer.

C.1.2. Trainings:

Training on safety issues is mandatory and must be provided to all personnel of the project as required by local regulations. Procedure for safety trainings includes the area of training, training intervals, forms of training, knowledge checks etc. The project host management maintains records for such trainings and periodic knowledge check-ups.

Activities that are directly related to the monitoring do not require specific training other than provided by the professional education. However, monitoring personnel will receive training on monitoring procedures and requirements. Personnel of the project host management will receive necessary training and consultations on monitoring requirements.

C.2. Involvement of Third Parties:

Private Enterprise "Production and Commercial Firm "Energo Max" – installation and connection of electricity meters.
Private Enterprise "Continent" – analysis of coal products samples.

C.3. Internal audits and control measures:

Internal cross-checks and audits are performed for all of the data monitored as the raw documents used for monitoring are also used in the commercial dealings of the company. Director of the company reviews monthly and yearly reports and conducts selective cross-checks with the raw documents.

Documents and reports on the data that are monitored will be archived and stored by the project participants. The following documents will be stored: primary documents for the accounting of monitored parameters in paper form; intermediate reports, orders and other monitoring documents in paper and electronic form; documents on measurement devices in paper and electronic form. These documents and other data monitored and required for determination and verification, as well as any other data that are to be monitored and are necessary for verification must be kept for two years after the last transfer of ERUs within the project. If expected data for monitoring concerning the production of coal is not available (that is used for calculating baseline emissions and leakages), they will not be taken into account and emission reductions will not be included. If there are no data of parameters used to calculate project emissions: consumption of electricity or diesel fuel, average specific data on consumption for the previous periods will be used. This is a conservative.

C.4. Troubleshooting procedures:

In cases if any errors, fraud, inconsistencies or situations when monitoring data are unavailable will be identified during the monitoring process special commission will appointed by project host management that will conduct a review of such case and issue an order that must also include provisions for necessary corrective actions to be implemented that will ensure such situations are avoided in future.
For data and parameters, monitoring of which is not made during the whole crediting period, and the values are determined only once (and remain unchanged during the whole crediting period) and are available or unavailable at the stage of determination of the PDD, the values indicated in the PDD are used. If updated data are not available, last publicly available actual values are used. If any data are not available for calculations GHG emissions data of the previous period are used.
For data and parameters, which are monitored during the whole crediting period, standard procedures in this sector for each data type are used. For example cross-checking with suppliers, receiving estimated values, averaging etc. In each case, changing the method of receiving data will be recorded and displayed in the monitoring report.

SECTION D. Calculation of GHG emission reductions

D.1. Table providing the formulas used:

Table 10 – Calculation formulas

Formula number from PDD	***Formula***	***Formula description***
Equation 18	$ER_y = BE_y - LE_y - PE_y$	Emission reductions as a result of the project implementation in period *y*
Equation 1	$BE_y = BE_{WHB,y}$	Baseline emissions in period *y*
Equation 2	$BE_{WHB,y} = \frac{FC_{BE,Coal,y}}{1000} \cdot p_{WHB} \cdot NCV_{Coal,y} \cdot OXID_{Coal,y} \cdot k^{C}_{Coal,y} \cdot 44/12$	Baseline emissions related to the burning of heaps in period *y*
Equation 3	$FC_{BE,coal,y} = FR_{coal,y} \cdot \frac{\left(1 - \frac{A_{rock,y}}{100} - \frac{W_{rock,y}}{100}\right)}{\left(1 - \frac{A_{coal,y}}{100} - \frac{W_{coal,y}}{100}\right)}$	Amount of coal, mined in the baseline scenario and burned for energy production, equivalent to the amount of coal, extracted from the waste heaps as a result of the project implementation in period *y*
Equation 4	$LE_y = LE_{CH_4,y} + LE_{EL,y}$	Leakages as a result of the project implementation in period *y*
Equation 5	$LE_{CH_4,y} = -FC_{BE,Coal,y} \cdot EF_{CH_4,CM} \cdot \rho_{CH_4} \cdot GWP_{CH_4}$	Leakages related to the fugitive methane emissions during the operation of mines in period *y*
Equation 7	$LE_{EL,y} = -FC_{BE,Coal,y} \cdot N^{e}_{coal,y} \cdot EF_{grid,y}$	Leakages as a result of electricity consumption from energy grid during coal mining in period *y*
Equation 8	$PE_y = PE_{EL,y} + PE_{Diesel,y}$	Project leakages as a result of the project implementation in period *y*
Equation 9	$PE_{EL,y} = EC_{PJ,y} \cdot EF_{grid,y}$	Project leakages as a result of electricity consumption from energy grid during project implementation in period *y*
Equation 10	$PE_{Diesel,y} = \frac{FC_{PJ,Diesel,y}}{1000} \cdot NCV_{Diesel,y} \cdot OXID_{Diesel,y} \cdot k^{C}_{Diesel,y} \cdot 44/12$	Project emissions as a result of diesel fuel consumption during project implementation in period *y*

Parameters in the formulas are as per Sections B.2.1 and B.2.2 of this report.
The coefficient 44/12 in the equations above is the ratio of the molecular weight of CO_2 (44) and the molecular weight of C (12) and is used to convert carbon emissions into carbon dioxide emissions.

Additionally in the formulas:

Table 11 – Parameters in formulas

Parameter	***Data unit***	***Description***
ER_y	tCO_2e	Emission reductions as a result of the project implementation in period *y*
BE_y	tCO_2e	Baseline emissions in period *y*
PE_y	tCO_2e	Project emissions as a result of the project implementation in period *y*
LE_y	tCO_2e	Leakages as a result of the project implementation in period *y*
$BE_{WHB,y}$	tCO_2e	Baseline emissions related to the burning of heaps in period *y*
$PE_{Diesel,y}$	tCO_2e	Project emissions as a result of diesel fuel consumption as a result of the project implementation in period *y*
$PE_{EL,y}$	tCO_2e	Project leakages as a result of electricity consumption from energy grid during project implementation in period *y*
$LE_{EL,y}$	tCO_2e	Leakages as a result of electricity consumption from energy grid during coal mining in year *y*
$LE_{CH_4,y}$	tCO_2e	Leakages related to the fugitive methane emissions during the operation of mines in year *y*

Results of the emissions calculations above are presented in metric tons of carbon dioxide equivalent (tCO_2e). The metric ton of carbon dioxide equivalent is equal to the metric ton of carbon dioxide (tCO_2). Therefore 1 tCO_2e = 1 tCO_2.

D.2. Description and consideration of measurement uncertainties and error propagation:

All measurement uncertainties and error propagation of the measured parameters are according to the manuals of equipment manufacturers. Uncertainty level of the fixed values and external data is low as they are taken from reliable and publicly available, verifiable sources.

D.3. GHG emission reductions (referring to B.2. of this document):

D.3.1. Project emissions:

Table 12 – Project emissions

Parameter	Unit	2008	2009	2010	2011	2012	Total
Project emissions	tCO_2e	2 155	2 397	2 745	2 286	1 776	11 359

D.3.2. Baseline emissions:

Table 13 – Baseline emissions

Parameter	Unit	2008	2009	2010	2011	2012	Total
Baseline emissions	tCO_2e	223 817	256 323	279 198	241 339	189 082	1 189 759

D.3.3. Leakage:

Table 14 – Leakages

Parameter	Unit	2008	2009	2010	2011	2012	Total
Leakages	tCO_2e	-68 196	-77 776	-85 793	-72 578	-56 863	-361 206

D.3.4. Summary of the emissions reductions during the monitoring period:

Table 15 – Emission reductions

Parameter	Unit	2008	2009	2010	2011	2012	Total
Emission reductions	tCO_2e	289 858	331 702	362 246	311 631	244 169	1 539 606

Annex 1

Definitions and acronyms

Acronyms and Abbreviations

CH_4	METHANE
CO_2	CARBON DIOXIDE
GHG	GREENHOUSE GASES
GWP	GLOBAL WARMING POTENTIAL
IPCC	INTERGOVERMENTAL PANEL ON CLIMATE CHANGE
PDD	PROJECT DESIGN DOCUMENT

Definitions

Baseline	The scenario that reasonably represents what would have happened to greenhouse gases in the absence of the proposed project, and covers emissions from all gases, sectors and source categories listed in Annex A of the Protocol and anthropogenic Removals by sinks, within the project boundary.
Emissions reductions	Emissions reductions generated by a JI project that have not undergone a verification or determination process as specified under the JI guidelines, but are contracted for purchase.
Global Warming Potential (GWP)	An index that compares the ability of greenhouse gases to absorb heat in the atmosphere in comparison to carbon dioxide. The index was established by the Intergovernmental Panel of Climate Change.
Greenhouse gas (GHG)	A gas that contributes to climate change. The greenhouse gases included in the Kyoto Protocol are: carbon dioxide (CO_2), Methane (CH_4), Nitrous Oxide (N_2O), Hydrofluorcarbons (HFCs), Perfluorcarbons (PFCs) and Sulphurhexafluoride (SF6).
Joint Implementation (JI)	Mechanism established under Article 6 of the Kyoto Protocol. JI provides Annex I countries or their companies the ability to jointly implement greenhouse gas emissions reduction or sequestration projects that generate Emissions Reduction Units.
Monitoring plan	Plan describing how monitoring of emission reductions will be undertaken. The monitoring plan forms a part of the Project Design Document (PDD).

Annex 2

Location of Measurement Points and Devices

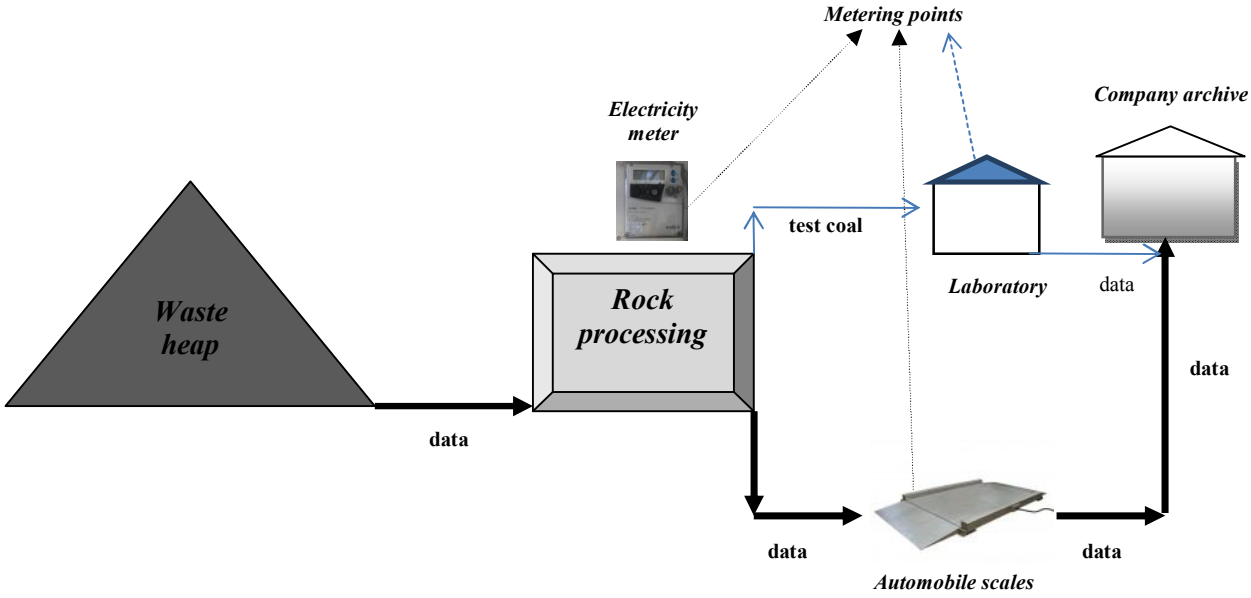

Figure 2 – Location of Measurement Points and Devices

Annex 3

Measurement Devices

Figure 3 – Electricity meter **"Actaris SL7000 Smart"**

Figure 4 – Automobile scales "VTA-60"

Annex 4

REFERENCE OF THE STATE STATISTICS SERVICE OF UKRAINE "ACTUAL EXPENSES OF ELECTRICITY FOR PRODUCTION OF ONE TON OF NON-AGGLOMERATED COAL"[24]

ДЕРЖАВНА СЛУЖБА СТАТИСТИКИ УКРАЇНИ
(Держстат України)

вул. Шота Руставелі, 3, м. Київ, 01601
тел. (044) 287-24-22, факс (044) 235-37-39, телетайп 132-168, E-mail: office@ukrstat.gov.ua,
www.ukrstat.gov.ua

29.05.2012р. № 15/1-20/691 На № від

Товариство з обмеженою відповідальністю
«Науково-дослідний центр КТФ»

01030 м. Київ, вул. Б. Хмельницького, 16/22

На Ваш лист від 23.05.2012р. № 12 Держстат у межах своїх повноважень надає наявну статистичну інформацію щодо фактичних витрат електроенергії на видобуток однієї тонни вугілля кам'яного неагломерованого.

Фактичні витрати електроенергії на видобуток однієї тонни вугілля кам'яного неагломерованого*.

кВт.г/т

	2008	2009	2010	2011
Україна	87,8	90,5	92,6	84,2

*Розраховано як частка від ділення фактичних витрат електроенергії на видобуток вугілля кам'яного неагломерованого за звітний період на обсяг видобутого вугілля кам'яного неагломерованого за звітний період, помножена на 1000.

Заступник Голови Н.С. Власенко

Вик. Смалява В.П.,
тел 287-36-81

---

[24] http://ji.unfccc.int/UserManagement/FileStorage/NMPXTGSA7E4C095DHRJYUWLOI8Z3V1