JOINT IMPLEMENTATION PROJECT

"Implementation of the energy efficiency measures and reduction of greenhouse gas emissions into the atmosphere at State Enterprise "Snizhneantratsyt"

Position of the head of the organization, institution, body, which prepared the document

Director
CEP Carbon Emissions Partners S.A. _____ **Fabian Knodel**
(position) (signature) (name and patronymic, last name)
PS

Position of the economic entity – owner of the source, where the Joint Implementation Project is planned to be carried out

General director of SE "Snizhneantratsyt"

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(position) (signature) (name and patronymic, last name)
PS

_____ 2012

JOINT IMPLEMENTATION PROJECT DESIGN DOCUMENT FORM
Version 01 - in effect as of: 15 June 2006

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SECTION A. General description of the project

A.1. Title of the project:

Implementation of the energy efficiency measures and reduction of greenhouse gas emissions into the atmosphere at State Enterprise "Snizhneantratsyt"

Sectoral scope: Sector 8.Mining/mineral production

PDD Version: 02.

Date: 31/08/2012

A.2. Description of the project:

The project "Implementation of the energy efficiency measures and reduction of greenhouse gas emissions into the atmosphere at State Enterprise "Snizhneantratsyt" is initiated by State Enterprise "Snizhneantratsyt" in order to improve the environmental situation in the region, increase the production efficiency as well as to improve the safety of coal production.

The Ukrainian coal mining industry is a complex business system which consolidates more than 167 operating coal mines and 3 coal pits, mines which are being removed from service, as well as coal processing plants, transport and other enterprises. Ukraine is the largest coal mining region in Europe and one of the eight largest coal miners globally.

In the territory of Donetsk Basin, coal is mainly located at an average depth of 400-800 m, the average thickness of coal seam being 0.6-1.2 m. The extraction method is based on underground mining. Most mines work at the depth of 400-800 m, but there are 35 mines in Donetsk Basin where coal is extracted at the depth of 1000-1300 m. Coal seams of Donetsk Basin are layered with rock and usually located every 20-40 m. Field development in such conditions leads to a great amount of rock extracted to the surface. Coal is separated from the rock, the latter being stocked in huge waste heaps spread all over the territory of Donetsk Basin. The coal separation process has historically been low-effective. Moreover, over a long period, it was considered economically unreasonable to extract 100% of coal from the rock raised. As a result, waste heaps in Donbas contain a great amount of coal.

Eventually, coal-containing waste heaps become inclined to self-ignition and smoulding. According to various estimates, rock raised contains up to 65-70% of coal, the remainder is rejects. Up to 60% of these rejects end up in waste heaps[1]. The heaps which are presently smouldering or running the risk of ignition are sources of uncontrolled emissions of greenhouse gases and hazardous substances. The latter include sulphur trioxide, which further on converts to sulphuric acid and causes acid rains, hydrogen sulphide and carbon oxide. Continuous erosion may cause the full disintegration of a heap and its turning into a massive heave, which is dangerous, both in the context of direct peril to people and property, and of significant emissions of solids and hazardous substances into the atmosphere. Erosion also accelerates

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

the spontaneous ignition process. Coal smouldering in heaps is a prolonged process, which can last up to 15 years[2].

Despite the danger caused by waste heap combustion, their extinction is not a customary practice in Donbas. Owners responsible for waste heaps are obliged to pay rather small penalties for environmental pollution. Thus, they have no major incentive to solve this issue and burning waste heaps may not be extinguished.

The baseline scenario assumes that this common practice will continue, and waste heaps will burn and cause uncontrolled GHG emissions into the atmosphere.

Waste heaps created as a result of coal mining in Donetsk Basin contain 10-15% of coal; their combustion is accompanied by a great amount of emissions of GHG and other hazardous substances into the atmosphere. Activities aimed at waste heap extinction, prior to the implementation of the JI project, did not lead to ultimate extinction of waste heaps since hot spots re-emerged occasionally.

The aim of the project is extinction and stabilization of two waste heaps: Waste heap of Zoria mine and Waste heap #7 of Udarnik mine of SE "Snizhneantratsyt", located in Snizhne city, Donetsk region. The project activity will prevent GHG emissions into the atmosphere. Project activities include waste heap stabilization using vermiculite.

A brief history of the project: The project was initiated in September 2003. The project design documents were completed in 2012. Assembly and construction works started in 2003. Waste heap stabilization was finished by the beginning of 2004. The JI mechanism was one of key factors from the very beginning, and financial benefits within the framework of this mechanism were one of the main reasons of this project implementation, playing a big part in making the decision to launch the project. On August 30, 2012, Letter of Endorsement No.2424/23/7 dated 30/08/2012 was issued for the JI project by the State Environmental Investment Agency of Ukraine.

A.3. Project participants:

Party involved*	Legal entity project participant (as applicable)	Please indicate if the Party involved wishes to be considered as project participant (Yes/No)
Ukraine (HOST PARTY)	• SE "Snizhneantratsyt"	No
Switzerland	• CEP Carbon Emissions Partners S.A.	No
*Please indicate if the Party involved is a host Party.		

State Enterprise "Snizhneantratsyt" is an organization that implements the project (Applicant). Code in the Unified State Register of Enterprises and Organizations of Ukraine 31906124. Type of activity: 05.10 Stone coal mining. The main activity of the company is the production of coal. The company has all

[2]. http://www.nbuv.gov.ua/portal/natural/Pb/2010_17/Statti/10.pdf

licenses and permits required under the Ukrainian law to produce coal. SE "Snizhneantratsyt" is responsible for design, construction and installation work performed by its own staff or through contractors. The enterprise finances the project and does not receive profit.

CEP Carbon Emissions Partners S.A. is a research and engineering organization. It is responsible for the development of project design documents for the joint implementation project. Besides, it will participate in determination, monitoring and verification of the project.

A.4. Technical description of the project:

A.4.1. Location of the project:

The project is located in Snizhne city, Donetsk region, Ukraine.

A.4.1.1. Host Party(ies):

The project is located in the territory of Ukraine.

Ukraine is an Eastern European country that ratified the Kyoto Protocol to the UN Framework Convention on Climate Change on February 4, 2004[3]. It is listed in Annex 1 and meets the requirements of participation in Joint Implementation projects[4].

A.4.1.2. Region/State/Province etc.:

The project is located in Donetsk region, Ukraine.

A.4.1.3. City/Town/Community etc.:

Snizhne town.

A.4.1.4. Detail of physical location, including information allowing the unique identification of the project (maximum one page):

Coordinates of Snizhne:

Latitude: 48° 01' 41" N
Longitude: 38° 46' 06" E

[3] http://zakon.rada.gov.ua/cgi-bin/laws/main.cgi?nreg=1430-15

[4] http://zakon.rada.gov.ua/cgi-bin/laws/main.cgi?page=1&nreg=995_801

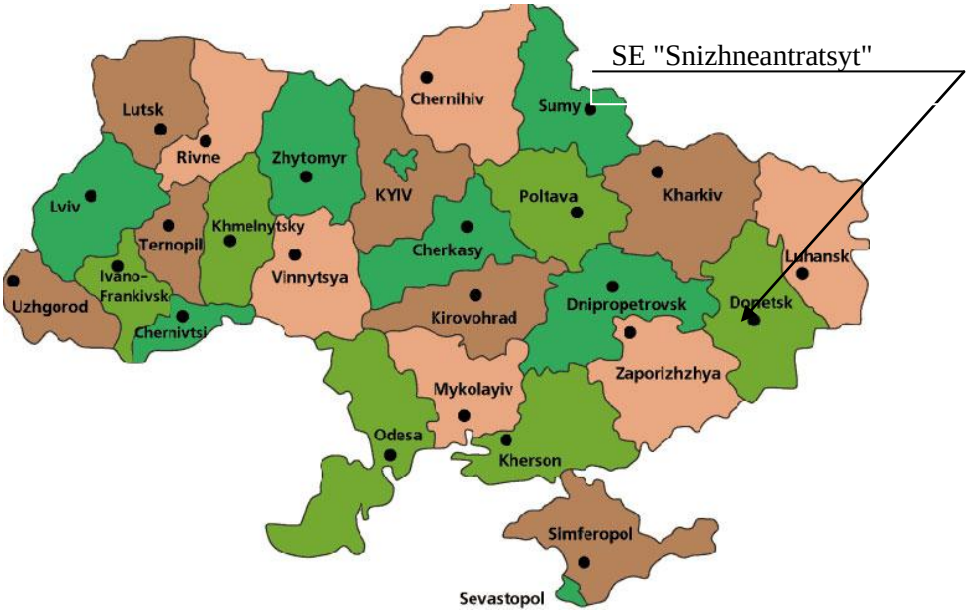
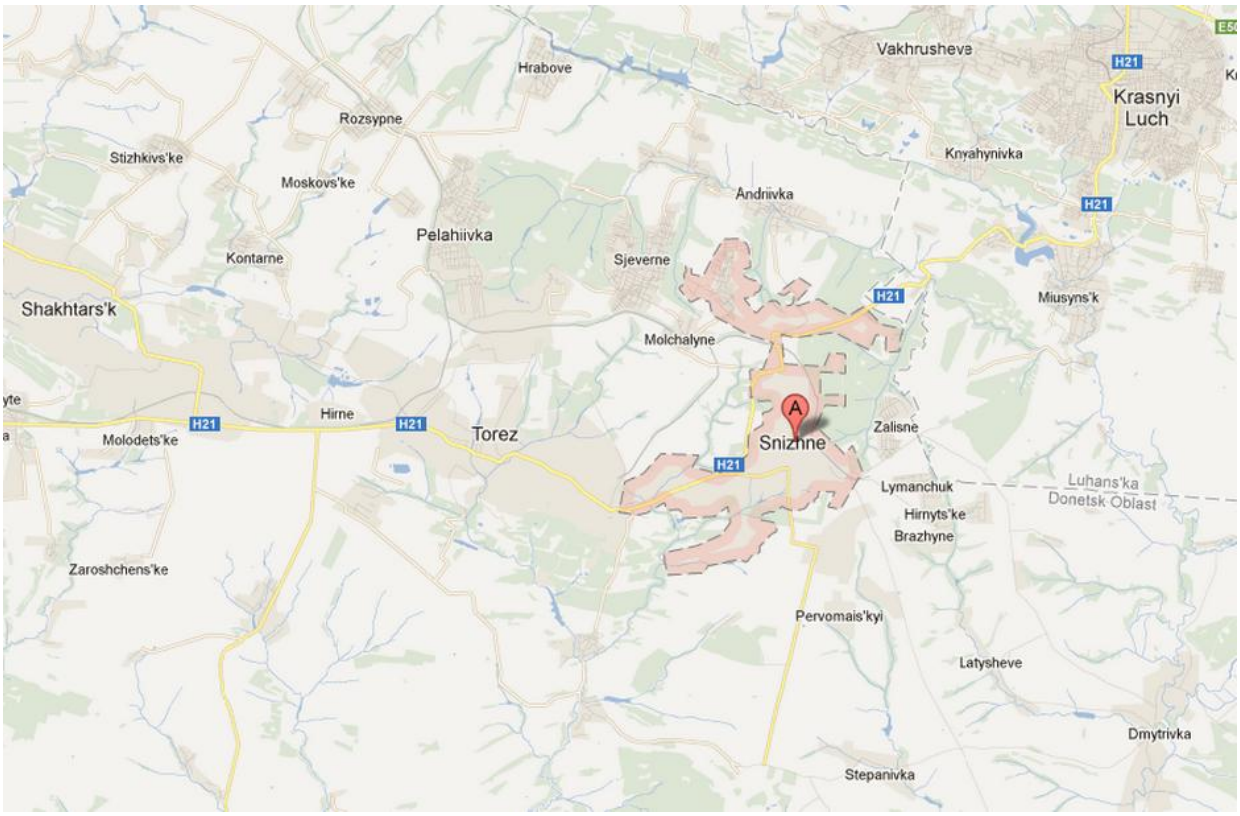


Figure A.4.1.4.1.Location of the facilities on the map of Ukraine



FigureA.4.1.4.2.Location of the facilities on the map of Ukraine

A.4.2. Technology(ies) to be employed, or measures, operations or actions to be implemented by the project:

The project "Implementation of the energy efficiency measures and reduction of greenhouse gas emissions into the atmosphere at State Enterprise "Snizhneantratsyt" provides for stabilization of waste heaps on the books of Zoria and Udarnyk mines of SE "Snizhneantratsyt". Specifications of the waste

heaps are sourced from waste heaps passports. The main characteristics are given in Table sections B and D, as well as Accompanying document 1 to this PDD. At the start of the project both piles identified as burning. This is confirmed by the results of research conducted by SRI "Respirator".

In order to stabilize the waste heaps an expensive technology involving the use of vermiculite is applied. Stabilization of SE “Snizhneantratsyt” waste heaps will be held under the technology described below.

Prior to extinction activities pathways and working sites are formed from non-flammable material (burned-out rock, boiler slag) to create access for the machinery to the waste heap. While carrying out these activities, wind direction is taken into account and the following equipment is used: concrete pump trucks designed to discharge working liquids while grouting wells in the course of drilling and overhauling; concrete mixer trucks for concrete mixture transportation and unloading it directly to the site; pumping units used for solution preparation and pumping thereof under the pressure to the wells; autonomous drilling rig; underground drilling workbench.

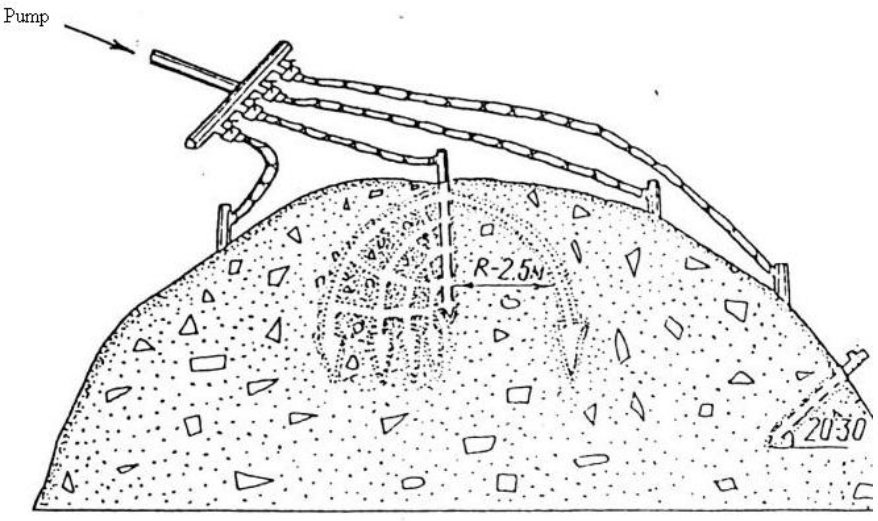
The rear and frontal part of waste heap channels are treated with vermiculite[5] mud powder, by means of reinstallation of automatic concrete pump and mixer. The material increases in volume by 15-30 times when heated to the temperature of 300-1000°C. Air layers ensure low density and high heat- and sound insulation. Apart from vermiculite, clay-based grout mixtures can be used to create the surface layer over the hot spots by pumping the mixtures through up to 2.0-meter-deep wells.

The mixture is supplied via a hinged concrete carrier of a concrete pump truck in several stages. The mixture is applied in the areas with burning rock, heated rock and rock that is not burning, including slopes. After it stops steaming and the temperature falls in the burning areas of the waste heap, works to estimate how deep the hot spots are located are to be done so that the height of heap lowering can be known which is needed for the operation safety and effective extinction.

To this end, drilling works are carried out and clay-based grout mixtures (vermiculite) are applied. Drilling works are aimed to reach the hottest spots. The number of the drilling workbench being reinstalled is to be minimal taking into account drilling of well ring in opposite directions from the axis of the heap towards the hottest spots.

One third of the length of the well (pipe column) is measured, and there casing pipes are perforated.

Fluids can be pumped simultaneously via several pipes joined with high-pressure flexible hoses with pipe manifold valves (Figure 5).



[5] http://en.wikipedia.org/wiki/Vermiculite

Figure A.4.2.1. Scheme of antipyrogen pumping with use of several perforated pipes.

To prevent antipyrogen emission along the outer walls of the casing pipe, equipment that seals the top of the well is used. Radiation levels are reduced in the heap by digging trenches of a particular size with bulldozers; filling the trenches with antipyrogen so that it can freely filter into the heap until the rock absorbs it all (Figure 6).

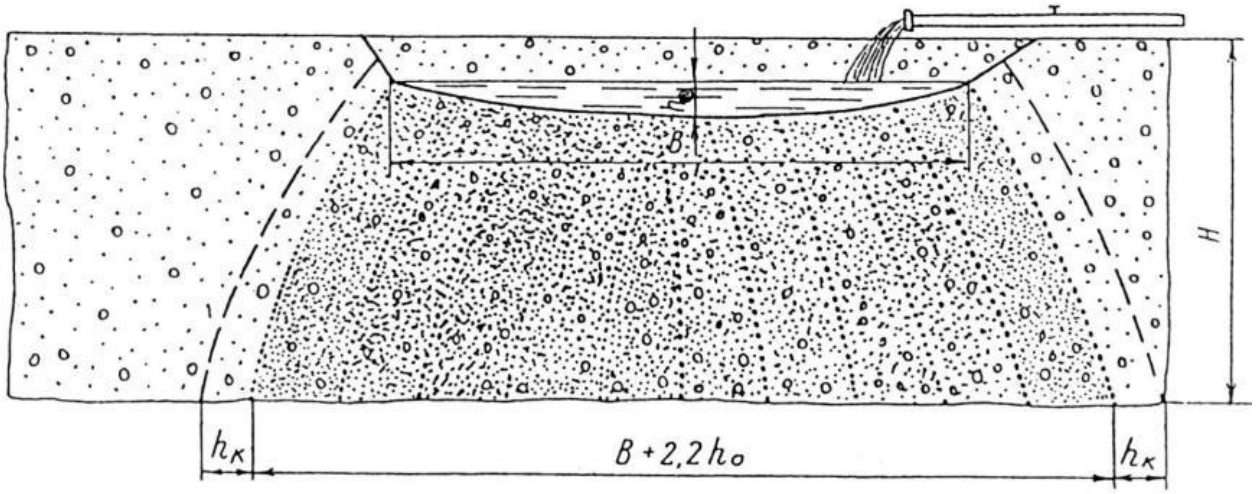


Figure A.4.2.2. Scheme of hydrating heaps with antipyrogen filtering freely.

The bulldozer pushes the cooled rock layer into crest splits with extra antipyrogen hydrating (the spraying method), increasing the density to the level at which air is as permeable as to exclude the possibility of ignition. In case rock amount is not enough to fill the space between the crests, trenches are dug and filled with antipyrogen repeatedly until a horizontal site is created.

The site, which covers the three waste heap channels, is made denser after antipyrogen is sprayed.

The last phase is to seed perennial cereals and legumes. Per 1 hectare of land, 20-30% more seeds is planted than normal for the zone.

A brief overview and specifications of equipment to be installed under the project activity are provided below.

1. Concrete pumps

Figure A.4.2.3. SP-8800 concrete pump

Main specifications of a concrete pump:

No.	Parameter	Value
1	Drive	D
2	Power, kW	440
3	Capacity (rod/piston), m^3/h	166/77
4	Pressure (rod/piston), bar	104/163
5	Piston stroke, mm	2000
6	Number of piston strokes per min	31/21
7	Cylinder diameter, mm	200
8	Working capacity of cylinder, l	62.83
9	Nominal rotation frequency, $min.^{-1}$	2100
10	Receiving funnel capacity, l	600
11	Discharge opening diameter, mm	1800
12	Weight, kg	10000

The concrete pump pumps vermiculite under pressure into a burning spot of a waste heap. Vermiculite is a hydrated mica phyllosilicate, which expands by 15-30 times when heated to 300-1000□C. Air layers in vermiculite structure ensure heat and sound insulation. The material insulates the burning spot from the waste heap mass, stopping the burning process that causes GHG emissions into the atmosphere.

Most of equipment used in this project, such as trucks, excavators, bulldozers, etc. are standard-type industrial equipment used worldwide. Project works will not require tailor-made equipment.

The project does not require intense pre-training. A certain number of staff members can be trained directly at the site. Most workers, such as operators of heavy machinery, truck and excavator drivers, mechanical engineers and electric engineers work at the project site. Maintenance needs of the project are met with local resources: own maintenance workers and repair subcontractors. The project provides for trainings. All employees must have valid professional licenses and pass safety instructions and exams on a regular basis. Professional education in all fields required for this project can be obtained in Donetsk region.

The project schedule is provided below.

№	Назва заходу	2004	2005	2006	2007	2008	2009	2010	2011	2012
1	Zoria Mine									
2	Waste heap extinction									
3	Adjustment and maintenance of waste heap monitoring system									
4	Implementation and maintenance of urgent extinction and self-ignition prevention system									
5	Udarnik Mine									
6	Waste heap extinction									
7	Adjustment and maintenance of waste heap monitoring system									
8	Implementation and maintenance of urgent extinction and self-ignition prevention system									

A.4.3. Brief explanation of how the anthropogenic emissions of greenhouse gases by sources are to be reduced by the proposed JI project, including why the emission reductions would not occur in the absence of the proposed project, taking into account national and/or sectoral policies and circumstances:

The proposed project provides for the stabilization of waste heaps that are under the control of coal mines. Waste heaps frequently spontaneously ignite and burn, causing emissions of hazardous substances and greenhouse gases. The fraction of coal in waste heaps can be as high as 28-32%[6], so the risk of spontaneous self-heating and burning is very high. According to different researches, up to 78% of waste heaps of Donbas are, or were burning at some point in time. If a waste heap has started burning, even if the fire has been 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 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.

Emission reductions due to the implementation of this project will come from the following major sources:

- Removing the source of green-house gas emissions from the burning / slow burning waste heap by quenching and stabilization of waste heap;

Efforts to stop the burning of waste heaps and complete stabilization of them solve several other ecological problems besides GHG emissions into the atmosphere. The proposed project is positively evaluated by local authorities.

[6] *Geology of Coal Fires: Case Studies from Around the World, Glenn B. Stracher, Geological Society of America, 2007, p. 47*
http://books.google.com.ua/books?id=eJU0WOABSWIC&printsec=frontcover&hl=ru#v=onepage&q&f=false

The project scenario provides for the completion of all waste heap extinction activities and adjustment of waste heap monitoring system by the end of 2003. Therefore, GHG emission reductions are estimated for the period starting January 1, 2004.

A.4.3.1. Estimated amount of emission reductions over the crediting period:

In the course of Project implementation the following emission reductions will be achieved at each Project stage:

Table A.4.3.1.1. Estimated emission reductions for the period preceding the first commitment period (2004-2007)

	Years
Length before the crediting period	4
Years	Estimate of annual emission reductions in tonnes of CO_2 equivalent
2004	87 780
2005	86 700
2006	86 016
2007	87 192
Total estimated emission reductions before the crediting period (tonnes of CO_2 equivalent)	**347 688**
Annual average of estimated emission reductions before the crediting period (tonnes of CO_2 equivalent)	**86 922**

Table A.4.3.1.2. Estimated emission reductions for the first commitment period (2008-2012)

	Years
Length of the crediting period	5
Years	Estimate of annual emission reductions in tonnes of CO_2 equivalent
2008	79 644
2009	80 820
2010	80 052
2011	80 052
2012	80 052
Total estimated emission reductions over the crediting period (tonnes of CO_2 equivalent)	**400 620**
Annual average of estimated emission reductions over the crediting period (tonnes of CO_2 equivalent)	80 124

Table A.4.3.1.3. Estimated emission reductions for the period following the first commitment period (2013-2018)

	Years
Length after the crediting period	6
Years	Estimate of annual emission reductions in tonnes of CO_2 equivalent
2013	80 052
2014	80 052
2015	80 052
2016	80 052
2017	80 052
2018	80 052
Total estimated emission reductions after the crediting period (tonnes of CO_2 equivalent)	**480 312**
Annual average of estimated emission reductions after the crediting period (tonnes of CO_2 equivalent)	80 052

For more details refer to Supporting Document 1 to this PDD in *.xlsx format.

For the description of the formulae used for calculation of emission reductions see Section D.1.4.

A.5. Project approval by the Parties involved:

The project has been supported by a Ukrainian Government representative, namely the State Environmental Investment Agency of Ukraine that issued Letter of Endorsement No. 2424/23/7 dated 30/08/2012 for the Joint Implementation project. Thus organizational risks are minimal.

Upon receiving of the Determination Report from an Accredited Independent Entity, the project design document (PDD) and the Determination Report will be submitted to the State Environmental Investment Agency of Ukraine and to an authorized entity of the country where another project participant is registered to obtain Letters of Approval.

SECTION B. Baseline

B.1. Description and justification of the baseline chosen:

A baseline for the JI project has to be set in accordance with Appendix B to decision 9/CMP.1 (JI guidelines)[7], and with further guidance on baseline setting and monitoring developed by the Joint Implementation Supervisory Committee (JISC). In accordance with the Guidance on criteria for baseline setting and monitoring (version 3)[8] (hereinafter referred to as Guidance), the baseline for a JI project is the scenario that reasonably represents the anthropogenic emissions by sources or anthropogenic removals by sinks of GHGs that would occur in the absence of the proposed project. In accordance with the Paragraph 9 of the Guidance the project participants may select either: an approach for baseline setting and monitoring developed in accordance with appendix B of the JI guidelines (JI specific approach); or a methodology for baseline setting and monitoring approved by the Executive Board of the clean development mechanism (CDM), including methodologies for small-scale project activities, as appropriate, in accordance with paragraph 4(a) of decision 10/CMP.1, as well as methodologies for afforestation/reforestation project activities. Paragraph 11 of the Guidance allows project participants that select a JI specific approach to use selected elements or combinations of approved CDM baseline and monitoring methodologies or approved CDM methodological tools, as appropriate.

Description and justification of the baseline chosen is provided below in accordance with the "Guidelines for users of the Joint Implementation Project Design Document Form", version 04[9], using the following step-wise approach:

Step 1. Indication and description of the theoretical approach chosen regarding baseline setting

Project participants have chosen the following approach regarding baseline setting, defined in the Guidance (Paragraph 9):

- An approach for baseline setting and monitoring developed in accordance with appendix B of the JI guidelines (JI specific approach).

The Guidance applies to this project as the above indicated approach is selected as mentioned in the Paragraph 12 of the Guidance. The detailed theoretical description of the baseline in a complete and transparent manner, as well as a justification in accordance with Paragraph 23 through 29 of the Guidance should be provided by the project participants.

The baseline for this project shall be established in accordance with appendix B of the JI guidelines. Furthermore, the baseline shall be identified by listing and describing plausible future scenarios on the basis of conservative assumptions and selecting the most plausible one.

The most plausible future scenario will be identified by performing a barrier analysis. Should only two alternatives remain, of which one alternative should represent the project scenario with the JI incentive, the CDM Tool “Tool for the demonstration and assessment of additionality” shall be used to prove that

[7] http://unfccc.int/resource/docs/2005/cmp1/eng/08a02.pdf#page=2
[8] http://ji.unfccc.int/Ref/Documents/Baseline_setting_and_monitoring.pdf
[9] http://ji.unfccc.int/Ref/Documents/Guidelines.pdf

the project scenario cannot be regarded at the most plausible one. Key factors that affect the baseline such as sectoral reform policies and legislation, economic situation/growth and socio-demographic factors in the relevant sector as well as resulting predicted demand, suppressed and/or increasing demand that will be met by the project, availability of capital, local availability of technologies/techniques, skills and know-how and availability of best available technologies/techniques in the future, will be taken into account while formulating the plausible future scenarios.

Step 2. Application of the approach chosen

Plausible future scenarios will be identified in order to establish a baseline.

Sub step 2a. Identifying and listing plausible future scenarios.

Scenario 1. Continuation of existing situation

Spontaneous self-heating and subsequent burning of waste heaps is very common and measures to extinguish fire are taken sporadically. Burning waste heaps are sources of uncontrolled greenhouse gas emissions.

Scenario 2. Implementation of the proposed project activity without registration as JI project.

This scenario is similar to the project activity only in this case the project does not benefit from the possible development as a joint implementation project.

Sub step 2b. Barrier analysis

Scenario 1. Continuation of existing situation

This scenario does not anticipate any activities and therefore does not face any barriers.

Scenario 2. Implementation of the proposed project activity without registration as JI project.

Investment barrier: This scenario is financially unattractive and faces barriers. Please refer to section B.2 for details.

Sub step 2d. Baseline identification

All scenarios, except Scenario 1 - Continuation of existing situation, face prohibitive barriers. Therefore, continuation of existing situation is the most plausible future scenario and is the baseline scenario.

This baseline scenario has been established according to the criteria outlined in the JISC Guidance:

1) On a project specific basis. This project is one of the first applications of this technology in Ukraine and therefore other options could not be used;

2) In a transparent manner with regard to the choice of approaches, assumptions, methodologies, parameters, data sources and key factors. All parameters and data are either monitored by the project participants or are taken from sources that provide a verifiable reference for each parameter. Project participants use approaches suggested by the Guidance and methodological tools provided by the CDM Executive Board;

3) Taking into account relevant national and/or sectoral policies and circumstances, such as sectoral reform initiatives, local fuel availability, power sector expansion plans, and the economic situation in the project sector. It is demonstrated by the above analysis that the baseline chosen clearly represents the most probable future scenario given the circumstances of modern day Donetsk Basin coal sector;

4) In such a way that emission reduction units (ERUs) cannot be earned for decreases in activity levels outside the project activity or due to force majeure. According to the proposed approach emission reductions will be earned only when waste heaps will be extinguished and stabilized under the project activity, so no emission reductions can be earned due to any changes outside of project activity.

5) Taking account of uncertainties and using conservative assumptions. A number of steps have been taken in order to account for uncertainties and safeguard conservativeness:

a.Same approaches as used for the calculation of emission levels in the National Inventory Reports (NIRs) of Ukraine are used to calculate baseline and project emissions when possible. NIRs use the country specific approaches and country specific emission factors that are in line with default IPCC values;
b. Lower range of parameters is used for calculation of baseline emissions and the upper range of parameters is used for calculation of project activity emissions
c. Default values were used to the extent possible in order to reduce uncertainty and provide conservative data for emission calculations.

Baseline Emissions

The main source of greenhouse gases emission into the atmosphere under the baseline scenario is carbon dioxide emissions from burning waste heaps. These are calculated as stationery combustion emissions from coal. 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 for a long period of time.
The table below provides values for national default parameters used to determine the baseline emissions.

Table B.1.1. List of standard national parameters used in the calculations of baseline emissions.

Parameter	***Unit of measurement***	***Description***	***Source of data***	***Value for the time of baseline setting***	
$EF^{y}_{b,C,coal}$	tC/ TJ	CO_2 emission factor for coal combustion	"National inventory report of anthropogenic emissions by sources and removals by sinks of	**2004p.**	26.19
				2005p.	26.05
				2006p.	26.02
				2007p.	26.04

			greenhouse gases in Ukraine for 1990-2010"[10]	**2008p.**	25.95
				2009p.	25.97
				2010p.	25.99
				2011p.	25.99
				2012p.	25.99
$NCV^{y}_{b,coal}$	GJ/t	Net calorific value of coal	"National inventory report of anthropogenic emissions by sources and removals by sinks of greenhouse gases in Ukraine for 1990-2010"[11]	**2004p.**	23,65
				2005p.	23,46
				2006p.	23.23
				2007p.	23.43
				2008p.	21.5
				2009p.	21.8
				2010p.	21.6
				2011p.	21.6
				2012p.	21.6
$OXID^{y}_{b,coal}$	relative units	Oxidation factor for coal combustion	"National inventory report of anthropogenic emissions by sources and removals by sinks of greenhouse gases in Ukraine for 1990-2010"[12]	**2004p.**	0.956
				2005p.	0.957
				2006p.	0.960
				2007p.	0.964
				2008p.	0.963
				2009p.	0.963
				2010p.	0.962
				2011p.	0.962
				2012p.	0.962

Emissions in the baseline scenario are calculated as follows:

$$BE_y = \sum BE^{j}_{PO} \quad (1)$$

Studies have shown that the period of waste heaps burning is 15 years [13], which means that the entire amount of coal of waste heap completely burned during this period. Project monitoring of waste heap condition allows for the control the condition of the heap and prevention of its burning, and if the latter occurs, to take measures for its rapid extinction, provides for the monthly monitoring of waste heap. Based on the conditions of the monitoring program of waste heap condition, the formula for calculation of GHG emissions from waste heap burning of the baseline was adapted to the activities of the monthly monitoring of heap condition.

$$BE^{y}_{PO} = \sum_{i=1}^{12} \frac{FC_{b,PO,coal} \cdot NCV^{y}_{b,coal} \cdot k^{y}_{i} \cdot EF^{y}_{b,CO2,coal}}{180}, \quad (2)$$

[10] http://unfccc.int/files/national_reports/annex_i_ghg_inventories/national_inventories_submissions/application/zip/ukr-2012-nir-13apr.zip

[11] http://unfccc.int/files/national_reports/annex_i_ghg_inventories/national_inventories_submissions/application/zip/ukr-2012-crf-13apr.zip

[12] http://unfccc.int/files/national_reports/annex_i_ghg_inventories/national_inventories_submissions/application/zip/ukr-2012-nir-13apr.zip

[13] http://www.nbuv.gov.ua/portal/natural/Pb/2010_17/Statti/10.pdf

$FC_{b,PO,coal}$ - total coal production in the waste heap at the beginning of performance of extinction works, ths t;

$NCV^{y}_{b,coal}$ - net calorific value of coal combustion in monitoring period *y* of the baseline scenario, (TJ/ths. t);

$EF^{y}_{b,CO_2,coal}$ - default CO_2 emission factor for stationary coal combustion in monitoring period *y* of the baseline scenario, t CO_2/TJ;

k^{y}_{i} – waste heap combustion factor at mine *i* for month *m* of year *y* (if waste heap combustion was detected in the reporting month, it is assumed that k=1, if the combustion was not detected, as provided by the project, it is assumed that k=0. Since the waste heap continues to burn under the baseline scenario, k=1 for all months of the monitoring period);

PO - index for waste heap;

b - index for the baseline scenario;

$coal$ - index for coal;

i - index for the sequence number of the month, year *y*.

$$FC_{b,PO,coal} = \frac{V_{PO} \cdot \rho_n \cdot C_{coal}}{1000000}, \qquad (3)$$

$FC_{b,PO,coal}$ - total quantity of coal in waste heap at the beginning of performance of extinction works, ths t;

$V_{PO.}$ – waste heap volume, m^3;

C_{coal} – consist of coal in the waste heap, %;

ρ_n - waste heap density, kg/m^3;

PO - index for waste heap;

b - index for the baseline scenario;

n - index for density;

$coal$ - index for coal.

$\left[\frac{1}{1000000}\right]$ - index for kg to thousand tonnes conversion.

$$EF^{y}_{b,CO2,coal} = EF^{y}_{b,C,coal} \cdot OXID^{y}_{b,coal} \cdot 44/12, \qquad (4)$$

$EF^{y}_{b,C,coal}$ - CO_2 emission factor in the process of coal combustion in monitoring period *y* of the baseline scenario, t C/TJ;

$OXID^{y}_{b,coal}$ - carbon oxidation factor in the process of coal combustion in monitoring period *y* of the baseline scenario, relative unit;

$44/12$ - stoichiometric ratio of CO_2 and C molecular masses, t CO_2 /t C;

y - index for monitoring period;

b - index for the baseline scenario;

$coal$ - index for coal.

Leakage:

Leakages are not expected in the baseline scenario, therefore:

$$LE_{Bly} = 0 \quad (5)$$

The key information and data used to establish the baseline (variables, parameters, data sources etc.) are presented below.

Data / Parameter	V_{PO}
Data unit	m^3
Description	Volume of waste heap at the moment of its extinction and stabilization
Time of determination/monitoring	Once
Source of data (to be) used	Waste heap passport
Value of data applied (for ex ante calculations/determinations)	Zoria Mine: 1688800 Udarnik Mine: 1068000
Justification of the choice of data or description of measurement methods and procedures (to be) applied	The specification NPAOP 10.0-5.21-04 "Manual on prevention of waste heap burning and waste heaps dismantling" specifies the key characteristics, including the volume of waste heap, which is fixed in passport of waste heap.
QA/QC procedures (to be) applied	Measuring of waste heap volume is conducted by accredited entities in accordance with national approved procedures and methodologies. Waste heap volume is fixed in passport. This ensures the cross-checking of data against the direct measuring of waste heap volume.
Any comment	Information on the volume of waste heap is the key factor for greenhouse gases emission calculation and will be archived in paper electronic forms.

Data / Parameter	C_{coal}
Data unit	%
Description	Coal content in waste heap
Time of determination/monitoring	Once
Source of data (to be) used	Determined value.
Value of data applied (for ex ante calculations/determinations)	10% (0.1)
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Unfortunately, there is no documentation at the enterprise that could show the content of coal in the waste heap. Taking in account the fact, that application of actual value is impossible, for baseline emission calculation the average value of coal content in Donbas region was applied on the basis of scientific research[14]. Besides, the

[14] http://www.envsec.org/publications/Risk%20Assessment%20Considerations%20in%20the%20Donetsk%20Basin%20Report_RUS.pdf

	same value was used in determined and approved JI projects (e.g. UA1000317[15]). Thus, the reliability of the data is beyond the doubt.
QA/QC procedures (to be) applied	Standard procedures.
Any comment	No

Data / Parameter	ρ_n
Data unit	kg/m^3
Description	Density of waste heap at the moment of its extinction and stabilization
Time of determination/monitoring	Once
Source of data (to be) used	Waste heap passport
Value of data applied (for ex ante calculations/determinations)	Zoria Mine: 2200 kg/m^3 Udarnik Mine: 2200 kg/m^3
Justification of the choice of data or description of measurement methods and procedures (to be) applied	The specification NPAOP 10.0-5.21-04 "Manual on prevention of waste heap burning and waste heaps dismantling" specifies the key characteristics, including the density of waste heap, which is fixed in passport of waste heap.
QA/QC procedures (to be) applied	Measuring of waste heap volume is conducted by accredited entities in accordance with national approved procedures and methodologies
Any comment	Information on the density of waste heap is the key factor for greenhouse gases emission calculation and will be archived in paper electronic forms.

Data / Parameter	$OXID^{y}_{b,coal}$	
Data unit	relative units	
Description	Oxidation factor of coal combustion	
Time of determination/monitoring	Annual.	
Source of data (to be) used	"National inventory report of anthropogenic emissions by sources and removals by sinks of greenhouse gases in Ukraine for 1990-2010"[16]	
Value of data applied (for ex ante calculations/determinations)	**2004**	0.956
	2005	0.957
	2006	0.960
	2007	0.964
	2008	0.963
	2009	0.963
	2010	0.962

[15] http://ji.unfccc.int/JIITLProject/DB/0RQXGLUAS7ETAGMUQZWFQPJLN1SIAW/details

[16] http://unfccc.int/files/national_reports/annex_i_ghg_inventories/national_inventories_submissions/application/zip/ukr-2012-nir-13apr.zip

	2011 0.962 **2012** 0.962
Justification of the choice of data or description of measurement methods and procedures (to be) applied	The parameter is used according to CDM approved methodology ACM0009, as well as the "Guidance on criteria for baseline setting and monitoring». The value based on officially approved national data will be used.
QA/QC procedures (to be) applied	Officially approved national data that are actual at the moment of the monitoring report preparation will be used.
Any comment	No

Data / Parameter	$EF^{y}_{b,CO_2,coal}$
Data unit	t C/TJ
Description	Carbon dioxide emission factor for coal stationary combustion
Time of determination/monitoring	Annually
Source of data (to be) used	"National inventory report of anthropogenic emissions by sources and removals by sinks of greenhouse gases in Ukraine for 1990-2010"[17]
Value of data applied (for ex ante calculations/determinations)	**2004** 26.19 **2005** 26.05 **2006** 26.02 **2007** 26.04 **2008** 25.95 **2009** 25.97 **2010** 25.99 **2011** 25.99 **2012** 25.99
Justification of the choice of data or description of measurement methods and procedures (to be) applied	In accordance with "Guidance on criteria for baseline setting and monitoring»
QA/QC procedures (to be) applied	Officially approved national data that are actual at the moment of the monitoring report preparation will be used.
Any comment	No

Data / Parameter	$NCV^{y}_{b,coal}$
Data unit	TJ/ths t
Description	Net calorific value of coal
Time of determination/monitoring	Annually
Source of data (to be) used	"National inventory report of anthropogenic emissions by sources and removals by sinks of greenhouse gases in Ukraine for 1990-2010"[18]

[17] http://unfccc.int/files/national_reports/annex_i_ghg_inventories/national_inventories_submissions/application/zip/ukr-2012-nir-13apr.zip

Value of data applied (for ex ante calculations/determinations)		**2004**	23,65	
		2005	23,46	
		2006	23.23	
		2007	23.43	
		2008	21.5	
		2009	21.8	
		2010	21.6	
		2011	21.6	
		2012	21.6	
Justification of the choice of data or description of measurement methods and procedures (to be) applied	In accordance with "Guidance on criteria for baseline setting and monitoring»			
QA/QC procedures (to be) applied	Officially approved national data that are actual at the moment of the monitoring report preparation will be used.			
Any comment	No			

B.2. Description of how the anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the JI project:

Anthropogenic greenhouse gas emissions in the project scenario will decrease due to implementation of permanent waste heap monitoring and extinction technologies at SE "Snizhneantratsyt" mines.

Implementation of these activities will considerably reduce fuel and energy resources consumption during production, entailing a reduction of greenhouse gas emissions into the atmosphere.

Additionality of the project

Additionality of the project activity is demonstrated and assessed below using the "Tools for the demonstration and assessment of additionality"[19] (Version 06.0.0). This tool was originally developed for CDM projects but it is also applicable to JI projects.

Step 1. Identification of alternatives to the project activity and their consistency with current laws and regulations

Sub-step 1a. Definition of alternatives to the project activity
There are two alternatives to this project (which have already been discussed in Section B.1 above):
Alternative 1. Continuation of the current situation, without the JI project implementation.
Alternative 2. Proposed project activity without the use of the JI mechanism.

Sub-Step 1b. Consistency of the alternatives with mandatory laws and regulations
Pursuant to the Law of Ukraine "On approval of safety rules in coal mines", waste heaps are considered potential pollutant sources. In a general case, ignited waste heaps should be extinguished and future ignition prevention measures should be taken, as stated in the Coal Mines Safety Rules. The document has weak effectiveness, so the relationship is in most cases regulated by the Code of Administrative

[18] http://unfccc.int/files/national_reports/annex_i_ghg_inventories/national_inventories_submissions/application/zip/ukr-2012-crf-13apr.zip

[19] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v06.0.0.pdf

Offences of Ukraine providing for mere insignificant penalties[20]. However, taking account of the large number of waste heaps and their large sizes, combined with limited financial resources of their owners, the latter usually do not even carry out the necessary waste heap monitoring. Even when a hot spot is detected, the owners prefer paying a penalty for atmospheric pollution rather than taking extinction measures. Burning waste heaps are rather common occurences and the situation is unlikely to improve in the near future. The experts believe the permanent lack of financing made the waste heap monitoring system in Ukraine totally ineffective.
Under such circumstances, it is obvious that the identified alternatives are consistent with the current legislation and standards of Ukraine.

Alternative 1:Continuation of the existing practice is the most realistic and plausible alternative to Project implementation, being associated with minimum financial investments.

Alternative 2: Proposed project activity without the use of the JI mechanism.
SE "Snizhneantratsyt" did not conduct major activities on waste heap extinction technology. Moreover, SE "Snizhneantratsyt" has neither incentives nor means of implementation of activities provided for by the JI project, other than income within the mechanism established by p.6 of the Kyoto Protocol to the UN Framework Convention on Climate Change, so *Alternative 2* cannot be considered a plausible baseline.

Outcome of Sub-step 1b. Under such circumstances, it is believed that all the scenarios are consistent with current laws and regulatory acts.

Therefore, Step 1 is satisfied.
According to the "Tool for the demonstration and assessment of additionality"[21] (Version 06.0.0), further justification of additionality shall be performed by means of investment analysis.

Step 2 – Investment analysis.
The main purpose of investment analysis is to determine whether the proposed project:

(a) is the most economically or financially attractive, or

(b) is economically or financially feasible without income from the sale of emission reduction units (ERUs) related to the JI project.

Sub-step 2a - Determination of appropriate analysis method.
There are three methods used for investment analysis:

- a simple cost analysis (Option I);
- an investment comparison analysis (Option II); and
- a benchmark analysis (Option III).

If the project activities and alternatives identified in Step 1 generate no financial or economic benefits other than JI related income, then the simple cost analysis (Option I) is applied. Otherwise, the investment comparison analysis (Option II) or the benchmark analysis (Option III) are used.
Additionality guidelines allow for performance of investment comparison analysis, which compares corresponding financial indicators for the most realistic and plausible investment alternatives (Option II), or the benchmark analysis (Option III). For this project it is appropriate to apply analysis using Option III, according to the instructions of the Tool for the demonstration and assessment of additionality. Based

[20] http://zakon2.rada.gov.ua/laws/show/80731-10

[21] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v06.0.0.pdf

on the key areas of project activities to reduce GHG emissions in the atmosphere for this project will correctly apply different methods of analysis, namely:

a) Analysis of investments in the company using the simple cost analysis Option I, in accordance with the instructions of the "Tool for the demonstration and assessment of additionality", which takes into account waste heaps extinction at SE "Snizhneantratsyt" (Sub-project A).
b) Analysis of investments in the company using the simple cost analysis Option I, in accordance with the instructions of the "Tool for the demonstration and assessment of additionality", which takes into account the implementation of permanent monitoring system and technology of waste heap extinction at SE "Snizhneantratsyt" (Sub-project B).

The enterprise receives no other financial or economic benefits other than income associated with JI in sub-projects B and C.

Sub-step 2b – Simple cost analysis

The project requires investment of more than EUR 1.92 million (NBU rate) [22], including:

- Sub-project A requires investment of more than EUR 0.31 million.
- Sub-project B requires investment of more than EUR 1.61 million.

Sub-projects A and B require investment costs that do not affect income. So the program of implementation of monitoring and urgent extinction of waste heaps brings no economic benefit to the company, but in turn requires large costs unnecessary from a financial standpoint. In accordance with the "Tool for the demonstration and assessment of additionality"[23] (Version 06.0.0) common practice analysis is used for sub-projects A and B.

Sub-step 2c – Calculation and comparison of financial indicators.

According to the Additionality guidelines, the calculation and comparison of financial indicators was not conducted.

Sub-step 2d: Sensitivity analysis

According to the Additionality guidelines, the sensitivity analysis was not conducted.

Step 3: Barrier analysis

According to the Additionality guidelines, the barrier analysis was not conducted.

Step 4: Common practice analysis

Sub-step 4a. Analysis of other activities similar to the proposed project activity

Analysis similar activities demonstrated the absence of similar projects in Ukraine.

The existing practice of operation of the existing facilities presented in the baseline option chosen for this Project is the common one for Ukraine. Due to the current practice all the activities and measures to implement permanent monitoring system and technology of extinction of waste heaps shall be borne by the enterprise, and SE “Snizhneantratsyt” does not have any incentive to implement permanent monitoring system and technology of extinction of waste heaps.

[22] http://www.bank.gov.ua/control/uk/curmetal/currency/search?formType=searchPeriodForm&time_step=daily&currency=196&periodStartTime=01.01.2007&periodEndTime=31.12.2007&outer=table&execute=%D0%92%D0%B8%D0%BA%D0%BE%D0%BD%D0%B0%D1%82%D0%B8

[23] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v06.0.0.pdf

Outcome of Sub-step 4a: Since there are no similar projects in Ukraine, there is no need to conduct the analysis of similar project activity.
According to the "Tool for the demonstration and assessment of additionality"[24] (Version 06.0.0), all steps are satisfied although there are some obstacles.
One of them is additional expenses for the JI project implementation to modernize operations;
The obstacle is associated with the structure of the existing tariffs for products manufactured at SE "Snizhneantratsyt", which does not consider investment in implementation of permanent monitoring system and technology of extinction of waste heaps by creating appropriate conditions for the reduction of GHG emissions. This causes permanent lack of funding and impossibility to implement permanent monitoring system and technology of extinction of waste heaps and invest into industry development.
We may conclude that the above-mentioned factors might hamper the implementation of the proposed project as well as *Alternative 2:* Project activity without the JI mechanism.
However, one of the alternatives is continuation of "business as usual" scenario. Since the barriers identified above are directly related to investment in implementation of permanent monitoring system and technology of extinction of waste heaps, SE "Snizhneantratsyt" has no obstacles for further operation without implementing those measures. Therefore, the identified obstacles cannot prevent the introduction of at least one alternative scenario - "business as usual."

Conclusion
Based on the above analysis it can be concluded that the project is additional.

B.3. Description of how the definition of the project boundary is applied to the project:

The project activities are physically limited to the waste heaps in the legal use of SE "Snizhneantratsyt": Waste heap of Zoria mine and Waste heap #7 of Udarnik. Project boundary for the baseline scenario is presented in a black rectangle in Figure B.3.1.

[24] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v6.0.0.pdf

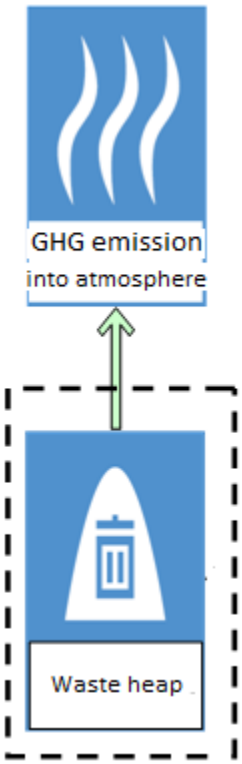


Figure B.3.1. Project boundary in the baseline scenario at SE "Snizhneantratsyt".

Project boundary for the baseline scenario is presented in a black rectangle in Figure B.3.2.

Figure B.3.2. Project boundary in the project scenario at SE "Snizhneantratsyt".

Table B.3.1. below shows an overview of all emission sources in the baseline and project scenarios and leakage that occurs during the project activity.

Table B.3.1. Sources of GHG emissions included into or excluded from the project boundary

	Source	**Gas**	**Included/Excluded**	**Justification / Explanation**
Baseline scenario	Waste heaps burning	CO_2	Yes	Main source of emission
		CH_4	No	Excluded for the purpose of simplification
		N_2O	No	Excluded for the purpose of simplification

Project scenario	Waste heaps burning	CO_2	Yes	The actions within the framework of project scenario are directed on the conservation of the waste heap that was already burning. It results in the elimination of possibility of repeated self-ignition of waste heap. However, in case if temperature increasing will be detected during monthly monitoring, emission of waste heap burning for the whole month will be taken into account in the calculations. This is conservative assumption.
		CH_4	No	Excluded for the purpose of simplification
		N_2O	No	Excluded for the purpose of simplification

Baseline scenario

The baseline scenario is the continuation of the existing situation. Waste heaps are often heated and self-ignite, causing carbon dioxide emissions into the atmosphere. Emission sources in the baseline that are included into the project boundary are:

- Carbon dioxide emissions from coal combustion in the waste heaps

Project scenario

The actions within the framework of project scenario are directed on the conservation of the waste heap that was already burning. It results in the elimination of possibility of repeated self-ignition of waste heap. However, in case if temperature increasing will be detected during monthly monitoring, emission of waste heap burning for the whole month will be taken into account in the calculations. This is conservative assumption.

Leakage

No leakages are expected in the project framework.

B.4. Further baseline information, including the date of baseline setting and the name(s) of the person(s)/entity(ies) setting the baseline:

Date of baseline setting: 20/06/2012.
The baseline was set by project developer CEP Carbon Emissions Partners S.A.
Project Design Document developer – contact information:

Organisation:	CEP Carbon Emissions Partners S.A.
Street/P.O.Box:	Route de Thonon
Building:	52
City:	Geneva
State/Region:	-
Postal code:	Casepostale 170 CH-1222 Vésenaz
Country:	Switzerland

Phone:	+41 (76) 3461157
Fax:	+41 (76) 3461157
E-mail:	0709bp@gmail.com
URL:	-
Represented by:	-
Title:	Director
Salutation:	Mr
Last name:	Knodel
Middle name:	-
First name:	Fabian
Department:	-
Phone (direct):	-
Fax (direct):	-
Mobile:	-
Personal e-mail:	-

SECTION C. Duration of the project / crediting period

C.1. Starting date of the project:

The starting date of the project activity is 17/09/2003; the starting date of the project is the date when project implementation began.

C.2. Expected operational lifetime of the project:

The waste heap monitoring and urgent extinction programmes implemented within the project framework have no lifetime limitations. The baseline takes account of an assumption that unless effective extinction measures are taken, all of the coal contained in the waste heap will burn down in 15 years (starting the moment of extinction finish). Taking into account the aforementioned and the conservative principle, the expected operational lifetime of the project in years and months is estimated at 15 years and 3 months / 183 months: from 17/09/2003 to 31/12/2018.

C.3. Length of the crediting period:

The total crediting period will be 15 years and 3 months (183 months), including:

- 2003-2007 – early crediting period (the project will apply for early quota offset under Article 17 of the Kyoto Protocol;
- 2008-2012 – crediting period (commitment period);
- 2013-2018 – status of emission reduction or increase of net removals generated by JI projects after the end of the first commitment period under the Kyoto Protocol (continuation of the crediting period after 2012) can be determined in line with the corresponding settlements and procedures within the UNFCCC framework and the Host party.

The ERU generation crediting period starts at the beginning of 2008 and will continue during the whole project life. The starting date of the crediting period is September 17, 2003. The end date is December 31, 2018.

SECTION D. Monitoring plan

D.1. Description of monitoring plan chosen:

In order to provide a detailed description of the monitoring plan chosen a step-wise approach is used:

Step 1. Indication and description of the approach chosen regarding monitoring

Option *a* provided by the Guidelines for users of the Joint Implementation Project Design Document Form, Version 04 [25] s used: JI specific approach is used in this project and therefore will be used for establishment of monitoring plan.

Step 2. Application of the approach chosen

Baseline scenario

The baseline scenario is the continuation of the existing situation. Waste heaps are often self-heating and burning causing carbon dioxide emissions into the atmosphere. Emission sources in the baseline that are included into the project boundary are:

- Carbon dioxide emissions from the burning of coal in the waste heaps

Project scenario

The actions within the framework of project scenario are directed on the conservation of the waste heap that was already burning. It results in the elimination of possibility of repeated self-burning of waste heap. However, in case if temperature increasing will be detected during monthly monitoring, emission of waste heap burning for the whole month will be taken into account in the calculations.

For any monitoring period the following parameters have to be collected and registered:

1. The temperature of the waste at waste heap. Waste heap is considered as burning if there is at least one burning point (area does not matter) with heap temperature greater than 80^{o}C at depth up to 2,5 m. Project emissions are expected to be equal zero. Mothballing of the burning waste heap foresees total

[25] http://ji.unfccc.int/Ref/Documents/Guidelines.pdf

elimination of possibility of waste heap burning. However, the condition of waste heap will still be controlled accurately. If, in emergency case, the indicators of temperature will show that there are evidences of waste heap burning, emissions caused by this process will be taken into account in emission reduction calculation. This parameter used for indication of whether the waste heap is burning or not. Temperature of waste heap is strictly controlled. The monitoring is performed once per month. The data of monitoring is submitted into the production logbooks and is the subject of reporting to company's management. On the basis of this data factor and according to NPAOP 10.0-5.21-04 "Manual on prevention of waste heap burning and waste heaps dismantling" k used for emission reduction calculation is estimated (is there are any evidences of waste heap burning factor k is equal 1, is there are no such evidences, then factor k is equal 0).

The project scenario provides for the completion of all waste heap extinction activities and adjustment of waste heap monitoring system by the end of 2003. Therefore, GHG emission reductions are estimated for the period starting January 1, 2004. At the monitoring stage this date will be reconsidered. If activities under the project are complete ahead of the schedule, calculations will still take into account the period starting the beginning of 2004, to ensure the conservativeness. If the activities planned are complete later than scheduled, GHG emission reductions will be recalculated.

Data and parameters that are not monitored throughout the crediting period are provided in Table 6 below:

Table D.1.1. Data and parameters that are monitored throughout the crediting period

$NCV^{y}_{p,coal}$; $NCV^{y}_{b,coal}$	Net calorific value of coal, TJ/ths t
$EF^{y}_{p,C,coal}$; $EF^{y}_{b,CO_2,coal}$	Carbon dioxide emission factor for stationary combustion of coal, t C/TJ
$OXID^{y}_{p,coal}$; $OXID^{y}_{b,coal}$	Oxidation factor for coal combustion, relative units

Data and parameters that are not monitored throughout the crediting period, but are determined only once (and thus remain fixed throughout the crediting period), and that are available already at the stage of determination regarding the PDD are provided in the table D.1.2. below:

Table D.1.2. Data and parameters that are not monitored throughout the crediting period, but are determined only once, thus remain fixed throughout the crediting period

V_{PO}	Volume of the waste heap at the moment of its extinction and stabilization, m^3
C_{coal}	Coal content in waste heap, %

ρ_n	Density of the waste heap at the moment of its extinction and stabilization, kg/m^3

Data and parameters that are not monitored throughout the crediting period, but are determined only once (and thus remain fixed throughout the crediting period), and that are not available already at the stage of determination: absent.

Archiving and storage of data and document management procedure

Documents and reports with the data that is to be monitored will be archived and stored by the project's participants. These documents and other monitoring data that need to be determined and verified, as well as any other data related to the project, are to be stored during at least two years after ERU generation is last reported.

Training of staff engaged to monitor waste heap condition

The technology that requires skills and knowledge will be used in the project. The local system of professional training ensures that the staff acquires the necessary skills and knowledge. The system is controlled by the government in Ukraine. The employees who are trained get a standard certificate of professional education. The workers who have the required skill level can operate the equipment. The management of the company where the project is implemented is to ensure that the staff is trained until fully skilled, which will allow the workers to run the corresponding equipment.
Instructions on safety norms are compulsory and are to be given to all the staff members under the local legislation. The procedure of giving instructions on safety norms includes training volume, training intervals, training methods, examination. The management of the company where the project is implemented is to ensure that registration entries for this training and regular examinations are made.

Procedures adopted for adjustment actions aimed at more precise monitoring and reporting in future

In case of any mistakes, careless actions or contradictions that the management of the company where the project is implemented will detect during monitoring, a committee will be set up to conduct investigation into such cases and to issue an order that will include regulations on necessary adjustment actions to be taken and to help avoid such situations in future.
The management of the company where the project is implemented is to establish connection that will make it possible that any person engaged to monitor waste heap condition can submit proposals, suggest improvements and contribute ideas for more precise monitoring in future. This connection between the workers and the management will enable the latter to react and take the necessary adjustment actions or suggest improvement. The project participant – CEP Carbon Emissions Partners S.A. – will do regular analysis of the monitoring plan and procedures, and it will offer necessary improvements to other project participants if needed.

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. $FC_{p,PO,coal}$	Total amount of coal in waste heap at the beginning of performance of extinction works	Calculated in accordance with the proposed monitoring plan	ths t	c	Once	100 %	Electronic/Paper	
2. $NCV^{y}_{p,coal}$	Net calorific value of coal combustion in monitoring period *y* of the project scenario	Reference value. "National inventory report of anthropogenic emissions by sources and removals by sinks of greenhouse gases in Ukraine for 1990-2010"[26]	TJ/ths t	e	Annually	100 %	Electronic/Paper	
3. $EF^{y}_{p,C,coal}$	Carbon emission factor	Reference value. "National	tC/TJ	e	Annually	100 %	Electronic/Paper	

[26] http://unfccc.int/files/national_reports/annex_i_ghg_inventories/national_inventories_submissions/application/zip/ukr-2012-nir-13apr.zip

	in the process of coal combustion in monitoring period *y* of the project scenario	inventory report of anthropogenic emissions by sources and removals by sinks of greenhouse gases in Ukraine for 1990-2010"[27]						
4. V_{PO}	Waste heap volume at the moment of waste heap extinction and stabilization	Waste heap passport data	m^3	e	Once	100 %	Electronic/Paper	*Zoria Mine: 1688800 m^3 Udarnik Mine: 1068000 m^3*
5. C_{coal}	Carbon content in waste heap	Publications based on the scientific researches[28].	%	e	Once	100 %	Electronic/Paper	10%
6. ρ_n	Waste heap density at the moment of waste heap extinction and stabilization	Waste heap passport data	kg/m^3	e	Once	100 %	Electronic/Paper	*Zoria Mine: 2200 kg/m^3 Udarnik Mine: 2200 kg/m^3*
7. k_i^y	Waste heap burning factor in month and year "*y*"	Results of monitoring of waste heaps conditions.	-	m	Monthly	100 %	Electronic/Paper	In case if the waste heap burning was detected in the reporting month the value is equal k=1, if

[27] http://unfccc.int/files/national_reports/annex_i_ghg_inventories/national_inventories_submissions/application/zip/ukr-2012-nir-13apr.zip
[28] http://www.envsec.org/publications/Risk%20Assessment%20Considerations%20in%20the%20Donetsk%20Basin%20Report_RUS.pdf

								the waste heap burning was not detected, as it is prescribed by the project, the value is equal k=0
8. $OXID^{y}_{p,coal}$	Carbon oxidation factor in the process of coal combustion in monitoring period *y* of the project scenario	Reference value. "National inventory report of anthropogenic emissions by sources and removals by sinks of greenhouse gases in Ukraine for 1990-2010"[29]	relative units	e	Annually	100 %	Electronic/Paper	

D.1.1.2. Description of formulae used to estimate project emissions (for each gas, source etc.; emissions in units of CO_2 equivalent):

For the project scenario setting under the proposed project was selected specific approach based on the requirements of JI projects in accordance with paragraph 9 (a) JI Guidance on criteria for baseline setting and monitoring.

Greenhouse gases emissions which included in the project scenario:

1. GHG emissions from coal burning in waste heaps.

Greenhouse gases emissions which included in the project scenario:

$$PE_y = \sum PE^{j}_{PO} \quad (6)$$

[29] http://unfccc.int/files/national_reports/annex_i_ghg_inventories/national_inventories_submissions/application/zip/ukr-2012-nir-13apr.zip

Studies have shown that the period of waste heaps burning is 15 years[30], which means that the entire amount of coal of waste heap completely burned during this period. Project monitoring of waste heap condition allows for the control the condition of the heap and prevention of its burning, and if the latter occurs, to take measures for its rapid quenching, provides for the monthly monitoring of waste heap. Based on the conditions of the monitoring program of waste heap condition, the formula for calculation of GHG emissions from waste heap burning of the baseline was adapted to the activities of the monthly monitoring of heap condition.

$$PE_{PO}^{y} = \sum_{i=1}^{12} \frac{FC_{p,PO,coal} \cdot NCV_{p,coal}^{y} \cdot k_{i}^{y} \cdot EF_{p,CO2,coal}^{y}}{180} + PE_{p,PO,disel}^{y}, \quad (7)$$

PE_{PO}^{y} - GHG emissions generated in the process of repeated flickering of waste heap after extinction measures, during period *y* of the project scenario, tCO_2eq;

$PE_{p,PO,disel}^{y}$ - GHG emissions from diesel fuel combustion, which is used in technological process of waste heaps extinction in monitoring period *y* of the project scenario, t CO_2eq;

$FC_{p,PO,coal} = FC_{b,PO,coal}$ - total amount of coal in waste heap at the beginning of performance of extinction works, ths t;

$NCV_{p,coal}^{y}$ - net calorific value of coal combustion in monitoring period «y», in the project scenario, TJ/ths t;

$EF_{p,CO_2,coal}^{y}$ - default CO_2 emission factor for stationary coal combustion in monitoring period «y», in the project scenario, t CO_2/TJ;

k_{i}^{y} – waste heap combustion factor at mine *i* for month *m* of year *y* (if waste heap combustion was detected in the reporting month, it is assumed that k=1, if the combustion was not detected, as provided by the project, it is assumed that k=0. Since the waste heap continues to burn under the baseline scenario, k=1 for all months of the monitoring period);

180 - number of months in fifteen years (15 years is the period of complete burning of waste heap).

disel - index for diesel fuel;

y - index for monitoring period;

i - index for sequence number of month, year *y*;

p - index for the project scenario;

n - index for density;

coal - index for coal.

[30] http://www.nbuv.gov.ua/portal/natural/Pb/2010_17/Statti/10.pdf

Emissions from diesel fuel consumed by technological equipment during waste heap extinction arise only in case of repeated burning of waste heap, and are less than 1% of the emissions generated in the process of waste heap burning because of it these emissions can be neglected. Thus:

$$PE^{y}_{PO} = \sum_{i=1}^{12} \frac{FC_{p,PO,coal} \cdot NCV^{y}_{p,coal} \cdot k^{y}_{i} \cdot EF^{y}_{p,CO2,coal}}{180}, \quad (8)$$

$$FC_{b,PO,coal} = \frac{V_{PO} \cdot \rho_{n} \cdot C_{coal}}{1000000}, \quad (9)$$

$FC_{b,PO,coal}$ - total amount of coal in waste heap at the beginning of performance of extinction works, t;

$V_{PO.}$ – waste heap volume, m^3;

C_{coal} – coal consist in waste heap, %;

ρ_{n} - waste heap density, kg/m^3;

PO - index for waste heap;

n - index for density;

$\left[\frac{1}{1000000}\right]$ - index for kg to thousand tonnes conversion.

$coal$ - index for coal.

$$EF^{y}_{p,CO2,coal} = EF^{y}_{p,C,coal} \cdot OXID^{y}_{p,coal} \cdot 44/12, \quad (10)$$

$EF^{y}_{p,C,coal}$ - carbon emission factor in the process of coal combustion in monitoring period *y* of the project scenario, t C/TJ;

$OXID^{y}_{p,coal}$ - carbon oxidation factor in the process of coal combustion in monitoring period *y* of the project scenario, relative units;

$44/12$ - stoichiometric ratio of CO_2 and C molecular masses, t CO_2/t C;

y - index for monitoring period;

p - index for the project scenario;

$coal$ - index for coal.

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
9. $FC_{b,PO,coal}$	Total quantity of coal in waste heap at the beginning of performance of quenching works	Calculated in accordance with the proposed monitoring plan	ths. t	c	Once	100 %	Electronic/Paper	
10. $NCV^{y}_{b,coal}$	Net calorific value of coal combustion in monitoring period *y* of the baseline scenario	Reference value. "National inventory report of anthropogenic emissions by sources and removals by sinks of greenhouse gases in Ukraine for 1990-2010"[31]	GJ/t	e	Annually	100 %	Electronic/Paper	
11. $EF^{y}_{b,C,coal}$	Carbon emission factor in the process of coal combustion in monitoring period *y* of	Reference value. "National inventory report of anthropogenic emissions by sources and	tC/TJ	e	Annually	100 %	Electronic/Paper	

[31] http://unfccc.int/files/national_reports/annex_i_ghg_inventories/national_inventories_submissions/application/zip/ukr-2012-nir-13apr.zip

	the baseline scenario	removals by sinks of greenhouse gases in Ukraine for 1990-2010"[32]						
12. V_{PO}	Waste heap volume at the moment of waste heap quenching and stabilization	Waste heap passport data	m^3	e	Once	100 %	Electronic/Paper	*Zoria Mine: 1688800 m^3 Udarnik Mine: 1068000 m^3*
13. C_{coal}	Carbon content in waste heap	Publications based on the scientific researches[33].	%	e	Once	100 %	Electronic/Paper	10%
14. ρ_n	Waste heap density at the moment of waste heap quenching and stabilization	Waste heap passport data	kg/m^3	e	Once	100 %	Electronic/Paper	*Zoria Mine: 2200 kg/m^3 Udarnik Mine: 2200 kg/m^3*
15. $OXID^{y}_{b,coal}$	Carbon oxidation factor in the process of coal combustion in monitoring period *y* of the baseline scenario	Reference value. "National inventory report of anthropogenic emissions by sources and removals by sinks of	relative units	e	Annually	100 %	Electronic/Paper	

[32] http://unfccc.int/files/national_reports/annex_i_ghg_inventories/national_inventories_submissions/application/zip/ukr-2012-nir-13apr.zip

[33] http://www.envsec.org/publications/Risk%20Assessment%20Considerations%20in%20the%20Donetsk%20Basin%20Report_RUS.pdf

		greenhouse gases in Ukraine for 1990-2010"[34]						

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

A specific approach based on the requirements to JI projects in accordance with paragraph 9 (a) of the JI Guidance on criteria for baseline setting and monitoring, Version 03, was chosen for the proposed project.

Under the baseline scenario continuation the process of waste heaps burning at SE "Snizhneantratsyt", emergence of new burning centers at waste heaps is the most plausible scenario.

GHG emissions included in the baseline scenario:

- GHG emissions caused by coal combustion in waste heaps.

$$BE_y = \sum BE^j_{PO} \quad (11)$$

Studies have shown that the period of waste heaps burning is 15 years[35], which means that the entire amount of coal of waste heap completely burned during this period. Project monitoring of waste heap condition allows for the control the condition of the heap and prevention of its burning, and if the latter occurs, to take measures for its rapid quenching, provides for the monthly monitoring of waste heap. Based on the conditions of the monitoring program of waste heap condition, the formula for calculation of GHG emissions from waste heap burning of the baseline was adapted to the activities of the monthly monitoring of heap condition.

$$BE^y_{PO} = \sum_{i=1}^{12} \frac{FC_{b,PO,coal} \cdot NCV^y_{b,coal} \cdot k^y_i \cdot EF^y_{b,CO2,coal}}{180}, \quad (12)$$

$FC_{b,PO,coal}$ - total coal production in the waste heap at the beginning of performance of extinction works, ths t;

$NCV^y_{b,coal}$ - net calorific value of coal combustion in monitoring period *y* of the baseline scenario, TJ/ths t;

$EF^y_{b,CO_2,coal}$ - default CO_2 emission factor for stationary coal combustion in monitoring period *y* of the baseline scenario, t CO_2/TJ;

[34] http://unfccc.int/files/national_reports/annex_i_ghg_inventories/national_inventories_submissions/application/zip/ukr-2012-nir-13apr.zip

[35] http://www.nbuv.gov.ua/portal/natural/Pb/2010_17/Statti/10.pdf

k_i^y – waste heap combustion factor at mine *i* for month *m* of year *y* (if waste heap combustion was detected in the reporting month, it is assumed that k=1, if the combustion was not detected, as provided by the project, it is assumed that k=0. Since the waste heap continues to burn under the baseline scenario, k=1 for all months of the monitoring period);

PO - index for waste heap;

[illegible] - index for the baseline scenario;

$coal$ - index for coal.

i - index for sequence number of the month, year «*y*».

$$FC_{b,PO,coal} = \frac{V_{PO} \cdot \rho_n \cdot C_{coal}}{1000000}, \quad (13)$$

$FC_{b,PO,coal}$ - total amount of coal in waste heap at the beginning of performance of extinction works, ths t;

$V_{PO.}$ – waste heap volume, m^3;

C_{coal} – content of coal in the waste heap, %;

ρ_n - waste heap density, kg/m^3;

PO - index for waste heap;

[illegible] - index for the baseline scenario;

n - index for density;

$coal$ - index for coal.

$\left[\frac{1}{1000000}\right]$ - index for kg to thousand tonnes conversion.

$$EF^y_{b,CO2,coal} = EF^y_{b,C,coal} \cdot OXID^y_{b,coal} \cdot 44/12, \quad (14)$$

$EF^y_{b,C,coal}$ - CO_2 emission factor in the process of coal combustion in monitoring period *y* of the baseline scenario, t C/TJ;

$OXID^y_{b,coal}$ - carbon oxidation factor in the process of coal combustion in monitoring period *y* of the baseline scenario, relative units;

$44/12$ - stoichiometric ratio of CO_2 and C molecular masses, t CO_2/t C;

y - index for monitoring period;

$_{baseline}$ - index for the baseline scenario;
$_{coal}$ - index for coal.

D. 1.2. Option 2 – Direct monitoring of emission reductions from the project (values should be consistent with those in section E.):

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

N/A

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 CO_2 equivalent):

N/A

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

No leakage related to the project implementation is expected.

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

No leakage is expected.

D.1.3.2. Description of formulae used to estimate leakage (for each gas, source etc.; emissions in units of CO_2 equivalent):

No leakage is expected, therefore:

$$LE_{Bly} = 0 \quad (15)$$

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 CO_2 equivalent):

Emission reductions (ER) are calculated as follows:

$$ER_y = BE_y - PE_y \quad (16)$$

where:

BE_y - baseline emission in period y, tCO_2eq;

PE_y - project emission in period y, tCO_2eq;

y - index for monitoring period;

b - index for baseline scenario;

p - index for project scenario.

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:

The main legislative acts of Ukraine concerning the monitoring of the environmental impact of business entities are:

- Ukrainian Law № 1264-XII «On environmental protection"[36] as of 25.06.1991
- Ukrainian Law № 2707-XII «On atmospheric air protection»[37] as of 16.10.1992.
- Current rules on emission limitation: «Norms of maximum permissible emissions of pollutants from permanent sources» – approved by the Ministry of Environmental Protection of Ukraine as of 27.06.2006, №309 and registered with the Ministry of Justice of Ukraine as of 01.09.2006, №912/12786.

In the framework of procedures performed at the request of the Law of Ukraine "On State Statistics", the company periodically reports on environmental indicators, in particular environmental department of SE "Snizhneantratsyt" develops quarterly report form № 2-TP (air) that is submitted to the State Statistics.

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.**
k_i^y	Low	Monitoring of waste heap conditions is carried out according to instructions, approved methodologies and in accordance with national standards of Ukraine. Monitoring is conducted by qualified workers and is the subject of top management control.
$NCV_{p,coal}^y$	Low	Net calorific value of coal is determined according to the "National inventory of anthropogenic greenhouse gases emissions by sources and removals by sinks of Ukraine", published by the State Environmental Investment Agency of Ukraine. This document is subject to periodic review and update.
$NCV_{b,coal}^y$	Low	Net calorific value of coal is determined according to the "National inventory of anthropogenic greenhouse gases emissions by sources and removals by sinks of Ukraine", published by the State Environmental Investment Agency of Ukraine. This document is subject to periodic review and update.
$EF_{p,C,coal}^y$	Low	Carbon emission factor for stationary coal combustion is determined according to the "National inventory of anthropogenic greenhouse gases emissions by sources and removals by sinks of Ukraine", published by the State Environmental Investment Agency of Ukraine. This document is subject to periodic review and update.
$EF_{b,C,coal}^y$	Low	Carbon emission factor for stationary coal combustion is determined according to the "National inventory of anthropogenic greenhouse gases emissions by sources and removals by sinks of Ukraine", published by the State Environmental Investment Agency of Ukraine. This document is subject to periodic review and update.

[36] http://zakon.rada.gov.ua/cgi-bin/laws/main.cgi?nreg=1264-12

[37] http://zakon.rada.gov.ua/cgi-bin/laws/main.cgi?nreg=2707-12

$OXID^{y}_{p,coal}$	Low	Oxidation factor for coal combustion is determined according to the "National inventory of anthropogenic greenhouse gases emissions by sources and removals by sinks of Ukraine", published by the State Environmental Investment Agency of Ukraine. This document is subject to periodic review and update.
$OXID^{y}_{b,coal}$	Low	Oxidation factor for coal combustion is determined according to the "National inventory of anthropogenic greenhouse gases emissions by sources and removals by sinks of Ukraine", published by the State Environmental Investment Agency of Ukraine. This document is subject to periodic review and update.

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

Operational and management structure to be applied by the SE “Snizhneantratsyt” for implementation of monitoring is given below in scheme.

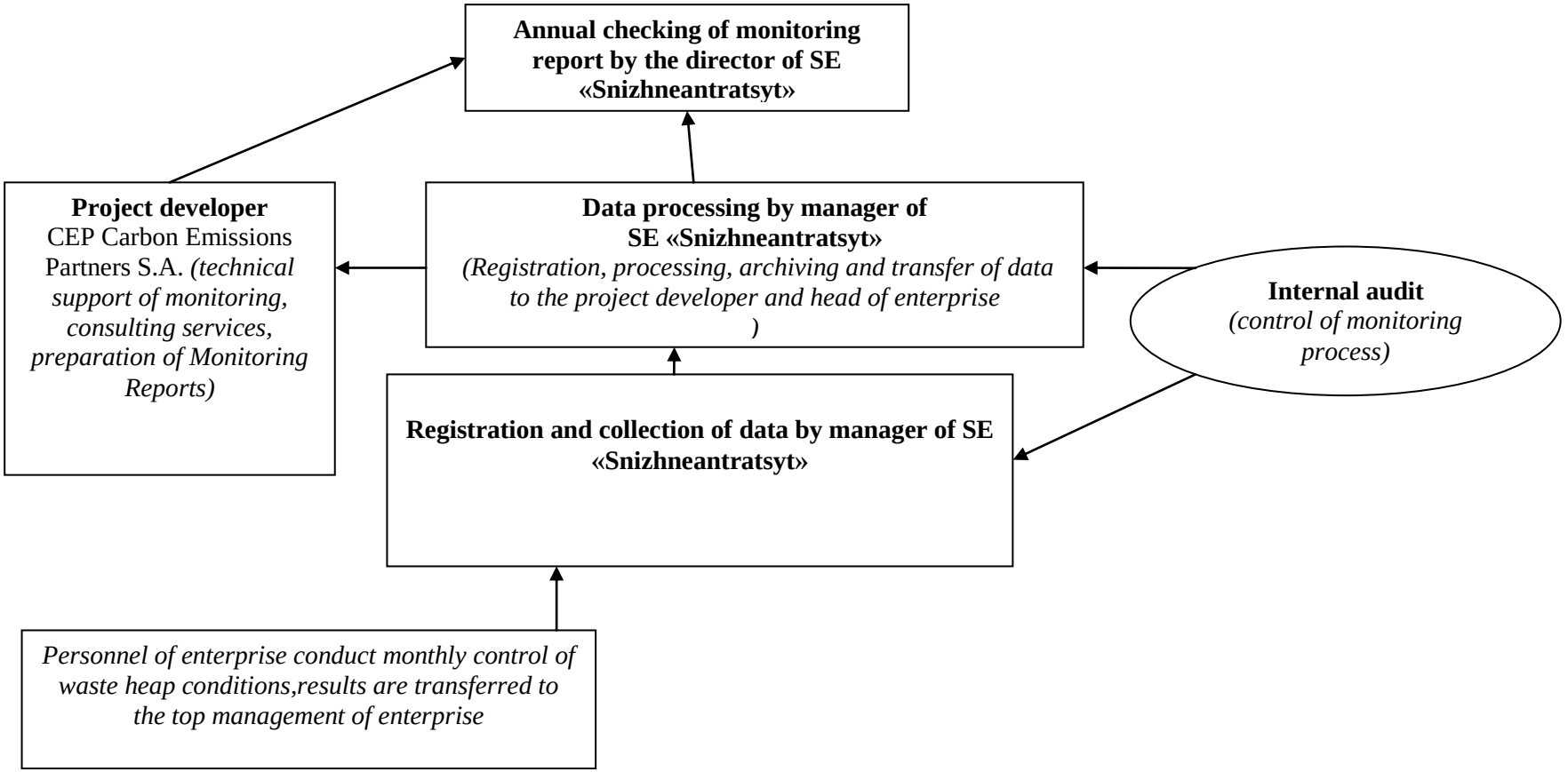


Figure D.3.1. Structure of collection and processing of data related to JI project

D.4. Name of person(s)/entity(ies) establishing the monitoring plan:

SE "Snizhneantratsyt", the company, which hosts the project.

CEP Carbon Emissions Partners S.A., project developer.

SECTION E. Estimation of greenhouse gas emission reductions

E.1. Estimated project emissions:

Project emissions were estimated in accordance with the formulas given in Section D.1.1.2. To estimate emissions for the period 2004-2011 existing data of SE "Snizhneantratsyt" on the actual monitoring parameters values for an appropriate period was used, for the period 2012-2018 predicted data according to the company development plant was used.

Results of calculation are given in tables below. The calculations are stated in Supporting Document 1 annexed to the PDD.

Table E.1.1. Estimated project emissions for the period preceding the first commitment period (January 1, 2004– December 31, 2007)

Source of emissions	Project emissions (t CO_2equivalent)				
	2004	2005	2006	2007	Total for the period 2004-2007
GHG emissions due to unexpected waste heaps burning after quenching and stabilization	0	0	0	0	0
Total (t CO_2equivalent)	0	0	0	0	**0**

Table E.1.2. Estimated project emissions during the first commitment period (January 1, 2008 – December 31, 2012)

Source of emissions	Project emissions (t CO_2equivalent)					
	2008	2009	2010	2011	2012	Total for the period 2008-2012
GHG emissions due to unexpected waste heaps burning after quenching and stabilization	0	0	0	0	0	**0**
Total (t CO_2equivalent)	0	0	0	0	0	**0**

Table E.1.3. Estimated project emissions for the period following the first commitment period (January 1, 2013. – December 31, 2018)

Source of emissions	Project emissions (t CO_2equivalent)						
	2013	2014	2015	2016	2017	2018	Total for the period 2013-2018

GHG emissions due to unexpected waste heaps burning after quenching and stabilization	0	0	0	0	0	0	**0**
Total (t CO_2equivalent)	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Detailed calculations are given in Supporting Document 1.

E.2. Estimated leakage:

Leakages are not expected.

E.3. The sum of E.1. and E.2.:

Since there no leakage is expected the sum of emissions from leakages and from the project activity is equal to emissions from the project activity, the results are given in the tables below.

Table E.3.1. Sum of emission from leakages and project activity for the period, preceding the first commitment period (January1, 2004.– December 31, 2007)

Year	Estimated project emissions (t CO_{2e})	Estimated leakages (t CO_2e)	Estimated project emissions and leakages (t CO_2e)
2004	0	0	0
2005	0	0	0
2006	0	0	0
2007	0	0	0
Total (t CO_2e)	**0**	**0**	**0**

Table E.3.2. Sum of emission from leakages and project activity during the first commitment period (January1, 2008– December 31, 2012)

Year	Estimated project emissions (t CO_{2e})	Estimated leakages (t CO_2e)	Estimated project emissions and leakages (t CO_2e)
2008	0	0	0
2009	0	0	0
2010	0	0	0
2011	0	0	0
2012	0	0	0
Total (t CO_2e)	**0**	**0**	**0**

Table E.3.3. Sum of emission from leakages and project activity for the period, after the first commitment period (January 1, 2013 - December 31, 2018)

Year	Estimated project emissions (t CO_{2e})	Estimated leakages (t CO_2e)	Estimated project emissions and leakages (t CO_2e)
2013	0	0	0

2014	0	0	0
2015	0	0	0
2016	0	0	0
2017	0	0	0
2018	0	0	0
Total (t CO_2e)	**0**	**0**	**0**

E.4. Estimated baseline emissions:

All results of baseline emissions assessment in the project are provided in tables below.

Table E.4.1. Estimated baseline emissions for the period preceding the first commitment period (January 1, 2004– December 31, 2007)

Source of emissions	Baseline emissions (t CO_2equivalent)				
	2004	2005	2006	2007	Total for the period 2004-2007
GHG emissions due to waste heaps burning	87780	86 700	86 016	87 192	**347 688**
Total (t CO_2equivalent)	87780	86 700	86 016	87 192	**347 688**

Table E.4.2. Estimated baseline emissions during the first commitment period (January 1, 2008 – December 31, 2012)

Source of emissions	Baseline emissions (t CO_2equivalent)					
	2008	2009	2010	2011	2012	Total for the period 2008-2012
GHG emissions due to waste heaps burning	79 644	80 820	80 052	80 052	80 052	**400 620**
Total (t CO_2equivalent)	79 644	80 820	80 052	80 052	80 052	**400 620**

Table E.4.3. Estimated project emissions for the period following the first commitment period (January 1, 2013. – December 31, 2018)

Source of emissions	Baseline emissions (t CO_2equivalent)						
	2013	2014	2015	2016	2017	2018	Total for the period 2013-2018
GHG emissions due to waste heaps burning	80 052	80 052	80 052	80 052	80 052	80 052	**480 312**
Total (t CO_2equivalent)	80 052	80 052	80 052	80 052	80 052	80 052	**480 312**

E.5. Difference between E.4. and E.3. representing the emission reductions of the project:

Project emission reductions = Baseline emissions – (Project emissions + Estimated leakage). All results of estimation of project emission reductions are given in tables below.

Table E.5.1. Estimated emission reductions for the period, preceding the first commitment period (January1, 2004– December 31, 2007)

Year	Emission reductions (t CO_2eq)
2004	87 780
2005	86 700
2006	86 016
2007	87 192
Total (t CO_2equivalent)	**347 688**

Table E.5.2. Estimated emission reductionsduring the first commitment period (January1, 2008– December 31, 2012)

Year	Emission reductions (t CO_2eq)
2008	79 644
2009	80 820
2010	80 052
2011	80 052
2012	80 052
Total (t CO_2equivalent)	**400 620**

Table E.5.3. Estimated emission reductionsfor the period, after the first commitment period (January 1, 2013 - December 31, 2018)

Year	Emission reductions (t CO_2eq)
2013	80 052
2014	80 052
2015	80 052
2016	80 052
2017	80 052
2018	80 052
Total (t CO_2equivalent)	**480 312**

E.6. Table providing values obtained when applying formulae above:

Table. E.6.1. Table, containing results of emission reductions estimations for the period, preceding the first commitment period (January1, 2004– December 31, 2007)

Year	Estimated project emissions (t CO_2eq)	Estimated leakages (t CO_2eq)	Estimated baseline emissions (t CO_2eq)	Estimated emission reductions (t CO_2eq)
2004	0	0	79 512	79 512
2005	0	0	80 076	80 076

2006	0	0	86 016	86 016
2007	0	0	87 192	87 192
Total (t CO_2 equivalent)	**0**	**0**	**332 796**	**332 796**

Table E.6.2. Table, containing results of emission reductions estimations during the first commitment period (January1, 2008– December 31, 2012)

Year	Estimated project emissions (t CO_2eq)	Estimated leakages (t CO_2eq)	Estimated baseline emissions (t CO_2eq)	Estimated emission reductions (t CO_2eq)
2008	0	0	79 644	79 644
2009	0	0	80 820	80 820
2010	0	0	80 052	80 052
2011	0	0	80 052	80 052
2012	0	0	80 052	80 052
Total (t CO_2 equivalent)	**0**	**0**	**400 620**	**400 620**

Table E.6.3. Table, containing results of emission reductions estimations for the period, after the first commitment period (January 1, 2013 - December 31, 2018)

Year	Estimated project emissions (t CO_2eq)	Estimated leakages (t CO_2eq)	Estimated baseline emissions (t CO_2eq)	Estimated emission reductions (t CO_2eq)
2013	0	0	80 052	80 052
2014	0	0	80 052	80 052
2015	0	0	80 052	80 052
2016	0	0	80 052	80 052
2017	0	0	80 052	80 052
2018	0	0	80 052	80 052
Total (t CO_2 equivalent)	**0**	**0**	**480 312**	**480 312**

SECTION F. Environmental impacts

F.1. Documentation on the analysis of the environmental impacts of the project, including transboundary impacts, in accordance with procedures as determined by the host Party

Ukraine is the Host Party in the project. Environmental Impact Assessment (EIA) is part of procedures for projecting and obtaining permissions within the framework of the Ukrainian project. The rules about carrying out EIA can be found in the Ukrainian state regulatory document on construction DBN A.2.2.-1-2003 (Title: Structure and Contents of Environment Impact Assessment (EIA) materials during design and construction of enterprises, buildings and facilities).
In Annex F of the regulatory document, object or activity types are specified that are considered highly dangerous for the environment and require full EIA, for which the Ministry of Ecology and Natural Resources of Ukraine is a competent body. The project activity that implies utilization of waste materials obtained during coal production is also specified in the Annex.
The main impact of the project activity on the environment is the positive impact on air, as the activity is aimed at a big decrease in amounts of GHG and other substances released into the atmosphere due to waste heap burning.
The impact on water is insignificant.
The impact on flora and fauna is positive, because, apart from CO2, other harmful substances would also be emitted into the atmosphere during waste heap burning.
The project activity will have no effect on land use.

F.2. If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to supporting documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party:

No negative impact is expected as a result of the project implementation.

SECTION G. Stakeholders' comments

G.1. Information on stakeholders' comments on the project, as appropriate:

No comments from stakeholders were received. The project activity does not provide for any negative environmental or social impact.

Annex 1

CONTACT INFORMATION ON PROJECT PARTICIPANTS

Owner of the project

Organisation:	SE "Snizhneantratsyt"
Street/P.O.Box:	Lenin St.
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Postal code:	86500
Country:	Ukraine
Phone:	+38 (06256)5-66-82
Fax:	+38 (06256)5-66-82
E-mail:	-
URL:	-
Represented by:	-
Title:	Director General
Salutation:	-
Last name:	Ivasiuk
Middle name:	-
First name:	Oleh
Department:	-
Phone (direct):	-
Fax (direct):	-
Mobile:	-
Personal e-mail:	-

Project developer:

Organisation:	CEP Carbon Emissions Partners S.A.
Street/P.O.Box:	Route de Thonon
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URL:	-
Represented by:	-
Title:	Director
Salutation:	Mr
Last name:	Knodel
Middle name:	-
First name:	Fabian
Department:	-
Phone (direct):	-
Fax (direct):	-
Mobile:	-
Personal e-mail:	-

Annex 2

BASELINE INFORMATION

The baseline was set according to a specific approach to the Joint Implementation (JI) projects, relying on "Criteria for the baseline and monitoring." (version 2) of Joint Implementation Supervisory Committee.
Key information for determining the baseline is presented in the tables below.
Summarized information on key elements of the baseline is presented in the table, which is given below:

Parameter	Description of the parameter	Measured (m), calculated (c), estimated (e)	Value (for the fixed parameter)	Source of data
$NCV^{y}_{b,coal}$	Net calorific value of coal combustion in monitoring period *y* of the baseline scenario, TJ/ths t	e	See Section B 1.	The source of data for this parameter is National inventory report of anthropogenic emissions by sources and removals by sinks of greenhouse gases in Ukraine 1990-2010. Parameter is based on officially approved national data.
$EF^{y}_{b,C,coal}$	CO_2 emission factor in the process of coal combustion in monitoring period *y* of the baseline scenario, t C/TJ	e	See Section B 1.	The source of data for this parameter is National inventory report of anthropogenic emissions by sources and removals by sinks of greenhouse gases in Ukraine 1990-2010. Parameter is based on officially approved national data.
$OXID^{y}_{b,coal}$	Carbon oxidation factor in the process of coal combustion in monitoring period *y* of the baseline scenario, relative units	e	See Section B 1.	Carbon oxidation factor when combusting fossil fuel is used to determine the carbon dioxide emission factor by default for stationary combustion of fossil fuels in

				Ukraine. The data source for this parameter is the National inventory report of anthropogenic emissions by sources and removals by sinks of greenhouse gases in Ukraine, based on approved national data.
V_{PO}		e	See Section B 1.	The source of data for this parameter is passports of waste heaps
C_{coal}	Coal content in the waste heap, %	e	See Section B 1.	The sources of data for this parameter are publications which envisage the results of scientific researches
ρ_n	Density of waste heap at the moment of its quenching and stabilization, t/m^3	e	See Section B 1.	The source of data for this parameter is passports of waste heaps

A specific approach based on the requirements to JI projects in accordance with paragraph 9 (a) of the JI Guidance on criteria for baseline setting and monitoring, Version 03, was chosen for the proposed project.
Under the baseline scenario continuation the process of waste heaps burning at SE "Snizhneantratsyt", emergence of new burning centers at waste heaps is the most plausible scenario.
GHG emissions included in the baseline scenario:

- GHG emissions caused by coal burning in waste heaps.

Factors of GHG emissions were taken from "National inventory report of anthropogenic emissions by sources and removals by sinks of greenhouse gases in Ukraine 1990-2010".[38]

[38] http://unfccc.int/files/national_reports/annex_i_ghg_inventories/national_inventories_submissions/application/zip/ukr-2012-nir-13apr.zip

Annex 3

MONITORING PLAN

For monitoring plan see Section D of the PDD.