# JOINT IMPLEMENTATION PROJECT

## "Implementation of the energy efficiency measures and reduction of greenhouse gas emissions into the atmosphere at SS "Coal mine named after F.E. Dzerzhynskyi", SE "DZERZHINSKUGOL"

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

**Director of Evo Carbon Trading Services Ltd**

| _____ | _____ | **N.L. Egorova** |
|---|---|---|
| (date) | (signature) | (name and patronymic, last name) |
| | PS | |

PS

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

**Director on commercial activity of**
**State Enterprise "DZERZHINSKUGOL"**

| _____ | | **O.V. Bondarenko** |
|---|---|---|
| (date) | (signature) | (surname, name and patronymic of the person) |
| | PS | |

Dzerzhinsk – 2012

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

## CONTENTS

## 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 SS "Coal mine named after F.E. Dzerzhynskyi", SE "DZERZHINSKUGOL"

Sectoral scope:
№ 8 – Mining/mineral production

Version 02
Date: 27/08/2012.

### A.2. Description of the project:

The project is initiated by State Enterprise «DZERZHINSKUGOL» in order to reduce greenhouse gases emissions into the atmosphere and to improve the environmental situation in the region.

The Ukrainian coal mining industry is a complex business system that integrates around 167 active coal mines and 3 coal strip mines, mines at the decommissioning stage, coal washing, transportation and other enterprises. Ukraine is the largest coal mining region in Europe and is among top eight in the world. The main coal mining area is Donbas that is located in Donetsk and Luhansk regions for the most part.

Coal is found in the area of Donbas at the average depth of 400-800 m. The average thickness of coal-bed is 0.6-1.2 m. Therefore coal in Donbas is produced mostly by mining. Most mines operate on the depth of 400-800 m but there are 35 mines in Donbas that extract coal from the 1000-1300 m level. Coal-beds in Donetsk basin are interleaved with rock and are usually found every 20-40 m. Mining activities in such conditions result in vast amounts of matter being extracted and brought to the surface. Coal is separated from rock and this non-coal matter forms huge waste heaps of tailings found almost everywhere in Donbas. Separation process on the mines was not and sometimes is not entirely efficient. For a long period of time it was not economically feasible to extract 100% of coal from the rock that had been mined. That is why waste heaps of Donbas contain considerable masses of coal. In the course of time those waste heaps are vulnerable to spontaneous ignition and slow combustion. According to different estimates the rock that is mined contains only up to 65-70% of coal only, the rest is barren rock. Up to 60% of this rock is put into waste heaps[1]. Waste heaps that are burning or are close to spontaneous ignition are sources of uncontrolled greenhouse gas and hazardous substances emissions. The latter include sulphurous anhydride that transforms into sulphur acid and is the reason for acid rains, hydrogen sulphide and carbon oxide. Erosion can lead overtime to the total destruction of a waste heap in a massive landslide that is dangerous both in terms of direct hazard to population and property and massive emissions of particles and hazardous substances into the atmosphere. Erosion also helps to intensify the process of spontaneous combustion. Combustion of coal in the waste heap is rather long-term and lasts up to 15 years.[2].

Despite the dangers caused by the burning waste heaps, it is common in the area of Donbas to not extinguish the fires. The owners that are responsible for the waste heaps receive relatively small fines for the air pollution, therefore there is little incentive for them to deal with the problem, and extinguishing those heaps that are currently alight may not be postponed.

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

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

In baseline scenario it is assumed that this common practice will be going on, waste heaps will be burning and will lead to continuous uncontrolled greenhouse gases (GHG) emissions into the athmosphere.

Waste heaps that appear in during the process of coal extraction from the mines of Donbas region in accordance with the scientific researches contain 10-15% of coal, burning of which leads to GHG emission and other hazardous substances emission into the atmosphere. Actions aimed at heap quenching before implementation of JI project were unable to fully quench heaps, so recurrent inflammations sometimes occurred. As a result of project implementation GHG emissions from burning of natural mine heaps will be dropped; that will reduce GHG emissions compared with the current practice.

Project is aimed at quenching and stabilization of the waste heaps that are under the control of mine "named after F.E.Dzerzhynskyi" that is managed by SE "DZERZHINSKUGOL" located in the town Dzerhynsk in Donetsk region. Project activity will reduce the emission of greenhouse gases into the atmosphere. Project activity lies in stabilization of waste heap applying vermiculite material.

Brief project history: Project was initiated in April 2006. Installation and construction activities were started in May 2006. Stabilization of waste heap was finished at the beginning of July 2006. Joint Implementation mechanism was one of the drivers for the project from the start and financial benefits provided by the JI mechanism were considered as one of the reasons to start the project and are crucial in the decision to start the operations. Project design document was finished in 2012

## 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 «DZERZHINSKUGOL» | No |
| Great Britain | • EVO CARBON TRADING SERVICES LTD | No |
| Switzerland | • CEP Carbon Emissions Partners S.A. | No |
| *Please indicate if the Party involved is a host Party. | | |

State Enterprise «DZERZHINSKUGOL» is an organization that implements the project (Applicant, Supplier). Code in the Unified State Register of Enterprises and Organizations of Ukraine 33839013. Type of activity: 05.10 Stone coal mining; 85.32 Professional and technical education; 46.71 Wholesale trade of fossil fuel; 71.12 Geological and geodesic activities. State Enterprise «DZERZHINSKUGOL» (hereinafter SE «DZERZHINSKUGOL») - one of the leaders in fuel and energy complex of Ukraine. The main activity of the company is the production of high-quality energy coal and anthracite. The company has all licenses and permits required under the Ukrainian law to produce coal and concentrate. SE «DZERZHINSKUGOL» 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.

EVO CARBON TRADING SERVICES LTD 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:

Project is located in Donetsk region, Ukraine, in Dzerzhynsk town.

#### A.4.1.1. Host Party(ies):

Project is located in Ukraine.

Ukraine is an Eastern European country that ratified the Kyoto Protocol to UN FCCC on February 4th, 2004[3]. enters into the list of the countries of the Annex 1 and is eligible for the Joint Implementation projects [4].

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

Project is located in Donetsk region.

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

Dzerzhynsk.

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

JI project is implemented on the territory of Dzerzhynsk town. Geographical location of the project is provided on figure 1.


*Fig.1 . Location of Dzerzhynsk town on the map of Ukraine*

[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

Geographical coordinates of the places of project implementation:
Mine «named after F.E. Dzerzhynskyi»: 37º50´27" E and 48º23´29" N.

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

"Implementation of the energy efficiency measures and reduction of greenhouse gas emissions into the atmosphere at SS "Coal mine named after F.E. Dzerzhynskyi", SE "DZERZHINSKUGOL" Project foresees the stabilization of waste heaps that belong to mine "named after F.E. Dzerzhynskyi" managed by SE "DZERZHINSKUGOL". For waste heaps stabilization the high-expense technology with the use of vermiculite material was applied.

Stabilization of waste heaps at SE «DZERZHINSKUGOL» is to be performed using the following technology.

Before the beginning of works on waste heap quenching heaping of dirt roads and operational platforms for delivering of transport to the waste heap is performed. Non-combustible materials (combusted waste, dross from boiler houses) are used for dirt roads. While the works implementation wind direction is taken into account. The following technological equipment is used: mobile gasoline pump that are needed for working liquids injection for wells cementing while drilling and repair; mobile concrete mixer needed for transportation of concrete mixture and it's unloading at the place of laying, pump facilities, used for solutions preparing and injection to wells under pressure, autonomous drilling plant for wells drilling, underground drilling machine.

Tail part and frontal part of the waste heap are processed with solution of vermiculite mud powder due to reinstallation of mobile concrete pump and mixer. Vermiculite belongs to the group of hydro-micaceous materials and has spherical structure. While heating up to temperature 300-1000 ° C vermiculite distends in 15-30 times. It results in air layer appearance that are the cause of high heat and volume isolating properties of distended vermiculite. Besides, plugging solutions on the basis of clay can be used for formation of surface screen over the burning centers through its injection to the wells with the depth of 2,0 meters.

Solution's injection is performed through hinge jointed mobile concrete pump through irruption in several stages. The sites with burning waste, heated waste and not burning waste, including slopes, are processed with the solution. After the pair is not exuded and the temperature of burning centers is reduced, the survey of burning centers depth for identification of height of waste heap decline for safe performance of activities and efficient quenching should be performed.

Drilling and washing with solution of mud powder (vermiculite) is carried out as a part of survey. The drilling is directed at the centers with the highest temperature. The number of drilling machine reinstallations is considered to be minimal taking into account drilling of wells ring from axis of waste heap hollow to the burning centers with the highest temperature.

Perforation of conductor pipe is performed on the length that is equal to the third part of well's length.

Injection of prophylactic liquid can be carried out through several pipes connected with high-pressure flexible hosepipes with distributing comb (fig.2).

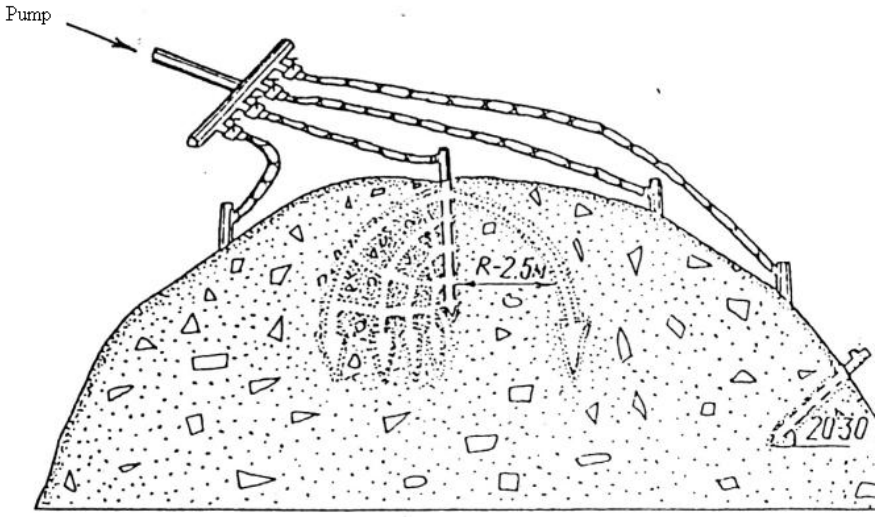


*Fig.2. Scheme of antipyrogen injection applying the perforated tubes.*

For antipyrogen emission removal facilities for sealing of mouth of well are installed along the external sides of casing in the upper part of well. The method of reduction of waste heap radiation includes the following steps: slot dozing with certain parameters by bulldozer, slot filling with antipyrogen for its free filtering into the waste heap massive until the total wetting of waste mass (fig.3).

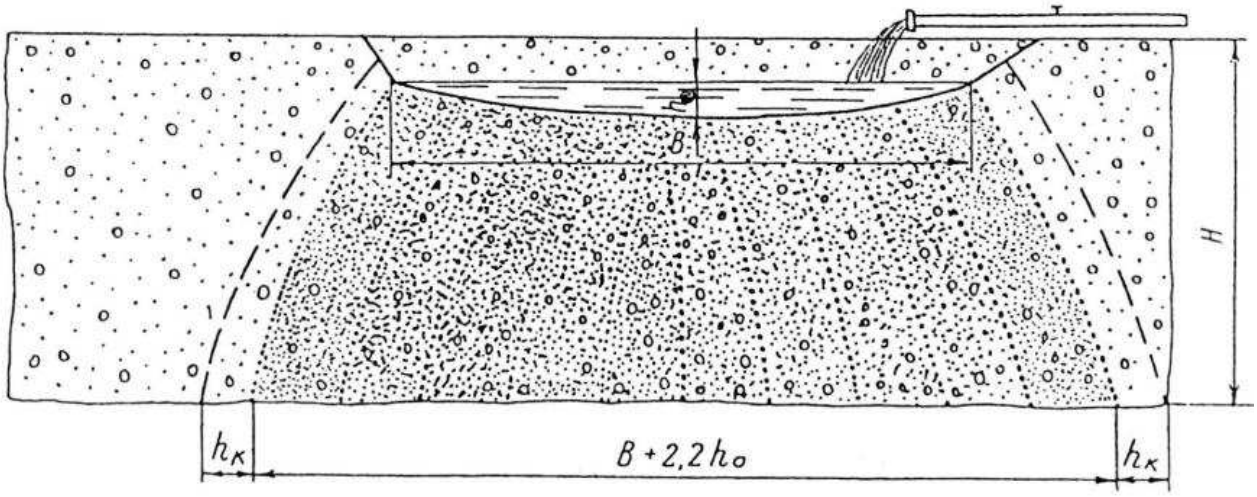


*Fig. 3.Scheme of waste heaps wetting through free antipyrogen filtration.*

Waste layer cooled with free filtration is pushed down to valley hollows by the bulldozer. The process takes place with additional wetting with antipyrogen by raining method with sealing up to fire safe coefficient of air permeability. In case if there is lack of waste for valley space filling, the process of slot dozing and slot filling with antipyrogen is repeated until the horizontal platform is formed. The formed platform that includes all three rays of waste heap is sealed with antipyrogen after wetting.

The last stage of the process is landscaping of waste heap with seeds of long-term grass, cereal and beans. The norm of seeds planting for 1 ha is equal to zonal with increasing up to 20-30%.

Short description and technical specifications of equipment to be installed under the project activity are listed below:

1. Concrete pumps


*Figure 4. Concrete Pump SP-8800*

The basic performance of concrete pump:

| № | Name of parameter | Value |
|---|---|---|
| 1 | Driving | D |
| 2 | Power, kW | 440 |
| 3 | Capacity (rod / piston), $m^3$ | 166/77 |
| 4 | Pressure (rod / piston), bar | 104/163 |
| 5 | Stroke, mm | 2000 |
| 6 | The number of strokes of the piston, per minute | 31/21 |
| 7 | Bore, mm | 200 |
| 8 | Cylinder capacity, l | 62.83 |
| 9 | Nominal frequency of rotation, min-1 | 2100 |
| 10 | Volume foster funnel, l | 600 |
| 11 | The diameter of the outlet, mm | 1800 |
| 12 | Curb weight, kg | 10000 |

With concrete pumps vermiculite under pressure is pumped into a place of fire in the dumps. Vermiculite - grade mineral silicates group hydromicas that when heated to a temperature of 300-1000℃ volume increases 10-15 times, and the layers of air, resulting in the structure of vermiculite, create high heat and sound insulation. Isolating center fire from the bulk dump the combustion process, which causes emissions to the atmosphere, interrupted.

Most of the equipment utilized by the project such as trucks, excavators, bulldozers is of a standard type used for industrial applications worldwide. The project activity will use a limited number of individually ordered equipment.

The project does not require extensive initial training. The required workforce can get basic industrial profession training locally. Most of the required personnel such as heavy machinery operators, trucks and excavator drivers, electric and mechanical maintenance workers are locally available. Maintenance needs are covered by the local capacities: in-house maintenance workers and outsourced maintenance and repair subcontractors. The project makes provisions for training needs. All workers are required to have a valid professional education certificate and pass periodical safety trainings and exams. Professional education can be obtained locally in the Donetsk region in all of the professional areas covered by the project.

Project implementation was conducted in accordance with the following schedule:
04/04/2006 in accordance with the results of temperature survey the waste heap of the mine was considered as the one which is burning. After that the development of the project aimed at the stabilization of waste heap has

started. Until the end of July 2006 all the actions directed on stabilization and quenching of waste heap were undertaken. Emission reduction generation in the framework of the project has started in August 2006.

**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 foresees the stabilization of waste heaps that are under the control of coal mines. Waste heaps are frequently spontaneously igniting and burning, causing emissions of hazardous substances and green-house gases. The fraction of coal in the waste heaps can be as high as 28-32%[5], 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 have been burning at some point in time . If a waste heap has started burning, even if the fire is extinguished, it will continue burning after a while unless the fire is extinguished regularly. Burning waste heaps in Ukraine are very often not taken care of properly, especially when there is no immediate danger to population and property, i.e. if the waste heap is 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 burning of waste heaps and complete stabilization of them solves several other ecological problems besides of GHG emission into the atmosphere. The proposed project is positively evaluated by local authorities.

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

*Table 1. Estimated GHG emission reduction for the period 2006-2007*

| | Years |
|---|---|
| Length of the crediting period | 2 |
| Year | Estimation of annual emission reduction in tonnes of $CO_2$ equivalent |
| 2006 | 340 748 |
| 2007 | 828 910 |
| Total estimated emission reduction for the crediting period 2006-2007 (tonnes of $CO_2$ equivalent) | 1 169 658 |
| Annual average estimated emission reduction over the crediting period 2006-2007 (tonnes of $CO_2$ equivalent) | 825 640 |

[5] *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

*Table 2. Estimated GHG emission reduction for the period 2008-2012*

| | Years |
|---|---|
| Length of the crediting period | 5 |
| Year | Estimation of annual emission reduction in tonnes of $CO_2$ equivalent |
| 2008 | 757 215 |
| 2009 | 768 372 |
| 2010 | 761 118 |
| 2011 | 761 118 |
| 2012 | 761 118 |
| Total estimated emission reduction for the crediting period 2008-2012 (tonnes of $CO_2$ equivalent) | 3 808 941 |
| Annual average estimated emission reduction over the crediting period 2008-2012 (tonnes of $CO_2$ equivalent) | 761 788 |

*Table 3. Estimated GHG emission reduction for the period 2013-2020*

| | Years |
|---|---|
| Length of the crediting period | 8 |
| Year | Estimation of annual emission reduction in tonnes of $CO_2$ equivalent |
| 2013 | 761 118 |
| 2014 | 761 118 |
| 2015 | 761 118 |
| 2016 | 761 118 |
| 2017 | 761 118 |
| 2018 | 761 118 |
| 2019 | 761 118 |
| 2020 | 761 118 |
| Total estimated emission reduction for the crediting period 2013-2020 (tonnes of $CO_2$ equivalent) | 6 088 944 |
| Annual average estimated emission reduction over the crediting period 2013-2020 (tonnes of $CO_2$ equivalent) | 761 118 |

Detailed information about emission reductions calculation can be found in Accompanying document Dzerzhynskiy_v_1.xls.

Description of formulas used for preliminary estimation of number of emission reductions units is given in Section D and in the Accompanying document Dzerzhynskiy _v_1.xls.

## A.5. Project approval by the Parties involved:

The JI project "Implementation of the energy efficiency measures and reduction of greenhouse gas emissions into the atmosphere at SS "Coal mine named after F.E. Dzerzhynskyi", SE "DZERZHINSKUGOL" was endorsed by the State Environmental Investment Agency of Ukraine, which is confirmed by the Letter of Endorsement № 2261/23/7 dated 17/08/2012

Upon determination of the project, the PDD and the Determination report will be presented at the State Environmental Investment Agency of Ukraine in order to obtain a Letter 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)[6], 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)[7] (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[8], 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 the project scenario cannot be regarded at the most plausible one.

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

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 feature 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. Direct energy production from the heat energy of burning waste heap.

Waste heaps are not extinguished and not monitored properly. Some burning heaps are used to produce energy by direct insertion of heat exchangers into the waste heap [9]. This captures a certain amount of heat energy for direct use or conversion into electricity.

Scenario 3. 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. Direct energy production from the heat energy of burning waste heap.

*Technological barrier*: This scenario is based on the highly experimental technology, which has not been implemented even in a pilot project. It is also not suitable for all waste heaps as the project owner will have to balance the energy resource availability (i.e. waste heap location) and the location of the energy user. On-site generation of electricity addresses this problem but requires additional interconnection engineering. In general this technology has yet to prove its viability. In addition it does not allow the control and management of the emitted gases. This technology has been proposed only in theory and has not reached implementation phase. Researches admit that “development of the real-world heat pump that will utilize the heat of the waste heap mass is hindered by a lot of serious problems”[10].

*Investment barrier*: Investment into unproven technology carries a high risk. In case of Ukraine, which carries a high country risk[11], investment into such unproven energy projects are less likely to attract investors than some other opportunities in the energy sector with higher returns. The pioneering character of the project may

[9] http://www.masters.donntu.edu.ua/2004/fgtu/zayanchukovskaya/library/artcl3.htm
[10] http://www.nbuv.gov.ua/portal/natural/spcb/2008-3/SPGS2008-3/01_Monakh.pdf
[11] http://www3.ambest.com/ratings/cr/reports/Ukraine.pdf

appeal to development programmes and governmental incentives but cost of the produced energy is likely to be much higher than alternatives.

Scenario 3. 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 Donbas 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 project activity will generate coal from the waste heaps, 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 higher 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 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 4. List of 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 | Carbon emission factor in the process of coal combustion | National Inventory Report of Ukraine 1990-2010.[12] p.458 | **2006** | 26,02 |
| | | | | **2007** | 26,04 |
| | | | | **2008** | 25,95 |
| | | | | **2009** | 25,97 |
| | | | | **2010** | 25,99 |
| | | | | **2011** | 25,99 |
| | | | | **2012** | 25,99 |
| $NCV^{y}_{b,coal}$ | GJ/t | Net calorific value of coal | National Inventory Report of Ukraine 1990-2010 p., p.456 | **2006** | 23,23 |
| | | | | **2007** | 23,43 |
| | | | | **2008** | 21,5 |
| | | | | **2009** | 21,8 |
| | | | | **2010** | 21,6 |
| | | | | **2011** | 21,6 |
| | | | | **2012** | 21,6 |
| $OXID^{y}_{b,coal}$ | - | Oxidation factor for coal combustion | National Inventory Report of Ukraine 1990-2010 p., p.459 | **2006** | 0,960 |
| | | | | **2007** | 0,964 |
| | | | | **2008** | 0,963 |
| | | | | **2009** | 0,963 |
| | | | | **2010** | 0,962 |
| | | | | **2011** | 0,962 |
| | | | | **2012** | 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 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.

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

[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 quenching works (ths t);

$NCV^{y}_{b,coal}$ - net calorific value of coal combustion in monitoring period «y», in 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», in the baseline scenario, (t $CO_2$ /TJ);

$k^{y}_{i}$ - waste heaps burning factor for month «*i*» year «*y*» (in case of waste heap burning were found in the reporting month is assumed to be k = 1, if the burning were found, as it provided under the project, then is taken k = 0. Because under the baseline scenario the waste heap continues to burn, k = 1 for all months of the monitoring period).

$[PO]$ - index relating to the waste heap;

*[b]* - index corresponding to the baseline scenario;

$[coal]$ - index relating to coal.

$[i]$ - index corresponding to the sequence number of the month, year «*y*».

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

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

$V_{PO}$ – waste heap volume, $m^3$;

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

$\rho_n$ - waste heap density, $kg/m^3$;

$[PO]$ - index relating to the waste heap;

*[b]* - index corresponding to the baseline scenario;

$[n]$ - index corresponding to density;

$[coal]$ - index relating to coal.

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

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

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

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

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

$[y]$ - index corresponding to the monitoring period;

*[b]* - index corresponding to the baseline scenario;

$[coal]$ - index relating to 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 quenching 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) | 24022900 |
| Justification of the choice of data or description of measurement methods and procedures (to be) applied | The specification НПАОП 10.0-5.21-04 «Specification on avoiding 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 applyied on the basis of scientific research[14]. Besides, the 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 |

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

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

| **Data/Parameter** | $\rho_n$ |
|---|---|
| Data unit | kg/m$^3$ |
| Description | Density of waste heap at the moment of its quenching 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) | 2400 kg/m$^3$ |
| Justification of the choice of data or description of measurement methods and procedures (to be) applied | The specification НПАОП 10.0-5.21-04 «Specification on avoiding 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 | ratio | |
| Description | Oxidation factor of coal combustion | |
| Time of determination/monitoring | Annual. | |
| Source of data to be used | National Inventory Report of Ukraine 1990-2010.[16] | |
| Value of data applied (for ex ante calculations/determinations) | **2006** | 0,960 |
| | **2007** | 0,964 |
| | **2008** | 0,963 |
| | **2009** | 0,963 |
| | **2010** | 0,962 |
| | **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 the "Guidance on criteria for baseline setting and monitoring». Parameter that is 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 emission factor for coal stationary combustion | |
| Time of determination/monitoring | Annually. | |
| Source of data to be used | National Inventory Report of Ukraine 1990-2010.[17] | |
| Value of data applied (for ex ante | **2006** | 26,02 |

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

| | | |
|---|---|---|
| calculations/determinations) | **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 | GJ / t | |
| Description | Net calorific value of coal | |
| Time of determination/monitoring | Annually. | |
| Source of data to be used | National Inventory Report of Ukraine 1990-2010.[18] | |
| Value of data applied (for ex ante calculations/determinations) | **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 gases (GHG) emissions will be reduced as a result of implementation of system of stable monitoring of waste heaps that belong to SS "Coal mine named after F.E. Dzerzhynskyi", SE "DZERZHINSKUGOL". Realization of this measure will lead to significant increasing of greenhouse gases (GHG) emission reduction to the atmosphere.

**Additionality of the project**

Additionality is demonstrated and estimated below applying "Tool for the demonstration and assessment of additionality"[19] (Version 06.0.0). This tool was developed for CDM projects, but it is possible to use it for JI projects.

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

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

**Step 1. Identification of alternatives to the project activity consistent with mandatory laws and regulations**

**Sub-step 1a. Define alternatives to the project activity**

There are two alternatives to the project (they were already mentioned in section B1).

*Alternative 1.1:* Continuation of existing situation without realization of JI project.

*Alternative 1.2:* Implementation of the project without JI investments involvement.

**Step 1b. Consistency with mandatory laws and regulations**

Existing Ukrainian laws and regulations treat waste heaps as sources of possible dangerous emissions into the atmosphere. In general burning waste heaps should be extinguished and measures must be taken to prevent fires in the future. This is regulated by the "Rules of Safety in Coal Mines"[20]. Enforcement of this document is quite weak and for the most part is regulated by the Code of Administrative Offences of Ukraine which foresees only a small fine for such offence [21] (up to approximately 17 EUR). However, due to the large numbers of waste heaps and their substantial sizes, combined with the limited resources of the owners, they typically do not even undertake the minimum required regular monitoring. Even when informed of a burning waste heap, and measures have to be taken under existing legislation, it is more typical to accept the fine for air contamination, rather than take action to extinguish the burning waste heap itself. Burning waste heaps are quite usual and no improvement of this situation is foreseen. Some experts even claim that due to the constant lack of financing the system of control over the waste heaps has been lost in Ukraine.

In such circumstances it is obvious that identified alternatives do not contradict existing laws and regulations taking into account the enforcement of such in Ukraine.

***Outcome of Step 1b*:** We have identified realistic and credible alternative scenarios to the project activities that are in compliance with mandatory legislation and regulations taking into account the enforcement in Ukraine.

Thus, Step 1. is satisfied.

In accordance with the «Tool for the demonstration and assessment of additionality»[22] (Version 06.0.0) further additionality demonstration is made by 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.**

[20] http://zakon1.rada.gov.ua/cgi-bin/laws/main.cgi?nreg=z0398-10
[21] http://zakon1.rada.gov.ua/cgibin/laws/main.cgi?page=2&nreg=80731-10

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

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.

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

In accordance with the methodological recommendations the sensitivity analysis was not conducted

**Sub-step 2d: Sensitivity analysis**

In accordance with the methodological recommendations the Calculation and comparison of financial indicators were 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 the other activities similar to the proposed project**

Waste heaps are considered as increased safety risk waste objects. In only a limited number of cases some minor fire extinguishing measures are taken but generally no actions are taken to secure the coal mining waste heaps. Waste heaps rich in coal are often target for uncontrolled amateur coal extraction by local population. These activities lead to increased fire risk and expose local population to increased air pollution.

**Outcome of sub-step 4a:** there are no similar projects in Ukraine, thus, there is no reason to conduct the common practice analysis.

In accordance with the «Tool for the demonstration and assessment of additionality» [23](Version 06.0.0) all steps are satisfied, but there are some other barriers.

One of them is the additional cost losses for the realization of JI project for implementation of the system of waste heap monitoring and technology of waste heap quenching.

Barrier is connected with the structure of existing prices for production of the enterprise, that do not include investments for implementation of waste heap monitoring system. This leads to the lack of money and

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

improbability of the implementation of monitoring system and quenching of waste heap, investments into the development of coal mining industry.

It can be concluded that all the mentioned above can be the barrier for implementation of the project as it is foreseen by *Alternative 1.2: Implementation of the project without JI investments involvement*.

However, one of the alternatives is the continuation of existing situation «business as usual». Due to the fact that barriers above are actual for investments to the implementation of system of waste heap monitoring technolog of waste heap quenching, SS "Coal mine named after F.E. Dzerzhynskyi", SE "DZERZHINSKUGOL" has no barriers for further operation without implementation of the project measures. Thus, identified barriers can not be actual for one alternative scenario: business as usual

**Conclusion**
On the basis of the analysis provided above 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 «DZERZHINSKUGOL». Project boundary for the baseline scenario is presented in a black rectangle in Figure 5.

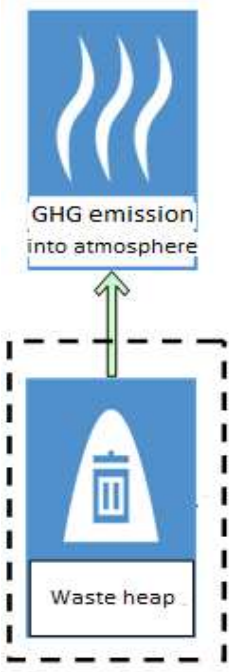


*Fig.5. Project boundary in the baseline scenario at SE «DZERZHINSKUGOL».*

Project boundary for the baseline scenario is presented in a black rectangle in Figure 6.


*Fig.6. Project boundary in the project scenario at SE «DZERZHINSKUGOL».*

Table 5 below shows an overview of all emission sources in the baseline and project scenarios and the leakage that occurs during the project activity.

*Table 5. Sources of emissions in the baseline and project scenarios and leakages of GHG.*

| | Source | Gas | Included/Excluded | Justification / Explanation |
|---|---|---|---|---|
| **Baseline scenario** | Waste heaps burning | $CO_2$ | Yes | Main source of emission |
| | | $CH_4$ | No | Excluded with the purpose of simplification |
| | | $N_2O$ | No | Excluded with 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-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. This is conservative assumption. |
| | | $CH_4$ | No | Excluded with the purpose of simplification |
| | | $N_2O$ | No | Excluded with the purpose of simplification |

**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. 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: 11.07.2012
Baseline was set by the project developer EVO CARBON TRADING SERVICES LTD.

Project Design Document developer – contact information:

| | |
|---|---|
| Organization: | EVO CARBON TRADING SERVICES LTD |
| Street/P.O.Box: | High Road |
| Building: | 869 |
| City: | London |
| State/Region: | |
| Postal code: | N12 8QA |
| Country: | Great Britain |
| Phone: | + 44 7500828771 |
| Fax: | |
| E-mail: | negorova@evocarbontrading.co.uk |
| Salutation: | Director |
| Last name: | Egorova |
| Middle name: | Lvivna |
| First name: | Nataliya |
| Department: | + 44 7500828771 |
| Mobile: | + 44 7500828771 |
| : | |

## SECTION C. Duration of the project / crediting period:

### C.1. Starting date of the project:

Starting date of the project is 01/04/2006, when management of SE «DZERZHINSKUGOL» decided to develop Joint Implementation project.

### C.2. Expected operational lifetime of the project:

The lifetime of the project is estimated to last until the June 2020. Thus the operational lifetime of the project will be 14 years and 8 months or 176 months.

### C.3. Length of the crediting period:

Start of the crediting period: 01/08/2006

Length of crediting period is 14 years and 5 month (173 months as total), including:

- 1 years and 5 month (01/06/2006 – 31/12/2007) during the period preceding the first commitment period under the Kyoto Protocol;
- 5 years and 0 month (01/01/2008 – 31/12/2012) during the first commitment period;
- 8 years and 0 month (01/01/2013- 31/12/2020) after the first commitment period.

Extension of the crediting period beyond 2012 is subject to approval by the host Party.

## 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 The Users Of The Joint Implementation Project Design Document Form, Version 04 [24] 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. Project emissions are expected to be equal zero. Mothballing of the burning waste heap foresees total 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

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

to company's management. On the basis of this data factor 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).

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

*Table 6. Data and parameters that are monitored throughout the crediting period*

| | |
|---|---|
| $NCV^{y}_{p,coal}$ | Net calorific value of coal |
| $EF^{y}_{p,C,coal}$ | Carbon emission factor for stationary combustion of coal |
| $OXID^{y}_{b,coal}$ | Oxidation factor for coal combustion |

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 7 below:

*Table 7. 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 quenching and stabilization |
| $C_{coal}$ | Coal content in waste heap |
| $\rho_n$ | Density of the waste heap at the moment of its quenching and stabilization. |

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, data storage and record handling procedure**

Documents and reports on the data that are monitored will be archived and stored by the project participants. These documents and other data monitored and required for determination and verification, as well as any other data that are relevant to the operation of the project will be kept for at least two years after the last transfer of ERUs.

**Training of monitoring personnel**

The project will utilize technology that requires skills and knowledge. This kind of skills and knowledge is available locally through the system of vocational training and education. This system is state-supervised in Ukraine. Professionals who graduate from vocational schools receive a standard certificate in the field

of their professional study. Only workers with proper training can be allowed to operate industrial equipment like. Management of the project host will ensure that personnel of the project have received proper training and are eligible to work with the prescribed equipment.

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

**Procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting**

That will conduct a review of such case and issue an order that must also include provisions for necessary corrective actions to be implemented that will ensure such situations are avoided in future.

The project host management will also establish a communication channel that will make it possible to submit suggestions, improvement proposals and project ideas for more accurate future monitoring for every person involved in the monitoring activities. Such communications will be delivered to the project host management who is required to review these communications and in case it is found appropriate implement necessary corrective actions and improvements. Project participant –EVO CARBON TRADING SERVICES LTD will conduct periodic review of the monitoring plan and procedures and if necessary propose improvements to the project participants.

**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 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 | |
| 2. $NCV^{y}_{p,coal}$ | Net calorific | Information | GJ/t | e | Annually | 100 % | Electronic/Paper | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | value of coal combustion in monitoring period «y», in the project scenario | value. National Inventory report of Ukraine 1990-2010[25] | | | | | | |
| 3. $EF^{y}_{p,C,coal}$ | Carbon emission factor in the process of coal combustion in monitoring period «y», in the project scenario | Information value. National Inventory report of Ukraine 1990-2010[26] | tC/TJ | e | Annually | 100 % | Electronic/Paper | |
| 4. $V_{PO}$ | Waste heap volume at the moment of waste heap quenching and stabilization | Waste heap passport data | $m^3$ | e | Once | 100 % | Electronic/Paper | *24022900 $m^3$* |
| 5. $C_{coal}$ | Carbon content in waste heap | Publications based on the scientific researches[27]. | % | e | Once | 100 % | Electronic/Paper | 10% |
| 6. $\rho_n$ | Waste heap density at the moment of waste heap quenching and stabilization | Waste heap passport data | $kg/m^3$ | e | Once | 100 % | Electronic/Paper | *2400 $kg/m^3$* |
| 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 |

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

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | value is equal k=1, if 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», in the project scenario, (relative unit) | Information value. National Inventory report of Ukraine 1990-2010[28] | - | 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:

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

[28] 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 [29], 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 quenching measures, during period «y» in 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 quenching in monitoring period «*y*», in the project scenario, (t $CO_2$-eq);

$FC_{p,PO,coal}$ - total quantity of coal in waste heap at the beginning of performance of quenching 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 burning factor in month and year "*y*" (in case of waste heap burning were found in the reporting month is assumed to be k = 1, if the burning were not found, as it provided under the project, then is taken k = 0.).

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

$[disel]$ - index relating to diesel fuel;

$[y]$ - index corresponding to montoring period;

$[i]$ - index corresponding to sequence number of month, year «*y*» ;

$[p]$ - index corresponding to the project scenario;

$[n]$ - index corresponding to density;

$[coal]$ - index relating to coal.

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

Emissions from diesel fuel consumed by technological equipment during waste heap quenching 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:

$$PE_{PO}^{y} = \sum_{i=1}^{12} \frac{FC_{p,PO,coal} \cdot NCV_{p,coal}^{y} \cdot k_{i}^{y} \cdot EF_{p,CO2,coal}^{y}}{180}, \quad (8)$$

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

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

$V_{PO.}$ – waste heap volume, $m^3$;

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

$\rho_{n}$ - waste heap density, $kg/m^3$;

$[PO]$ - index relating to waste heap;

$[n]$ - index corresponding to density;

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

$[coal]$ - index relating to coal.

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

$EF_{p,C,coal}^{y}$ - carbon emission factor in the process of coal combustion in monitoring period «y», in the project scenario, (t C/TJ);

$OXID_{p,coal}^{y}$ - carbon oxidation factor in the process of coal combustion in monitoring period «y», in the project scenario, (relative unit);

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

$[y]$ - index corresponding to the monitoring period;

$[p]$ - index corresponding to the project scenario;

$[coal]$ - index relating to 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», in the baseline scenario | Information value. National Inventory report of Ukraine 1990-2010[30] | 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», in the baseline scenario | Information value. National Inventory report of Ukraine 1990-2010[31] | tC/TJ | e | Annually | 100 % | Electronic/Paper | |

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

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

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 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 | *24022900 $m^3$* |
| 13. $C_{coal}$ | Carbon content in waste heap | Publications based on the scientific researches[32]. | % | e | Once | 100 % | Electronic/Paper | 10% |
| 14. $\rho_n$ | Waste heap density at the moment of waste heap quenching and stabilization | Waste heap passport data | $kg/m^3$ | e | Once | 100 % | Electronic/Paper | *2400 $kg/m^3$* |
| 15. $OXID^y_{b,coal}$ | Carbon oxidation factor in the process of coal combustion in monitoring period «y», in the baseline scenario, (relative unit) | Information value. National Inventory report of Ukraine 1990-2010[33] | - | e | Annually | 100 % | Electronic/Paper | |

**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.

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

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

Under the baseline scenario continuation the process of waste heaps burning at SE «DZERZHINSKUGOL», 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.

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

Studies have shown that the period of waste heaps burning is 15 years [34], 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 quenching works (ths t);

$NCV^y_{b,coal}$ - net calorific value of coal combustion in monitoring period «y», in 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», in the baseline scenario, (t $CO_2$ /TJ);

$k^y_i$ – waste heaps burning factor for month «*i*» year «*y*» (in case of waste heap burning were found in the reporting month is assumed to be k = 1, if the burning were found, as it provided under the project, then is taken k = 0. Because under the baseline scenario the waste heap continues to burn, k = 1 for all months of the monitoring period).

$[PO]$ - index relating to the waste heap;

*[b]* - index corresponding to the baseline scenario;

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

$[coal]$ - index relating to coal.

$[i]$ - index corresponding to the 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 quantity of coal in waste heap at the beginning of performance of quenching works (ths t);

$V_{PO.}$ – waste heap volume, $m^3$;

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

$\rho_n$ - waste heap density, $kg/m^3$;

$[PO]$ - index relating to the waste heap;

*[b]* - index corresponding to the baseline scenario;

$[n]$ - index corresponding to density;

$[coal]$ - index relating to coal.

$\left[\frac{1}{1000000}\right]$ - index relating to 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», in the baseline scenario, (t C/TJ);

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

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

$[y]$ - index corresponding to the monitoring period;

*[b]* - index corresponding to the baseline scenario;
[*coal*] - index relating to 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:**

Leakages related to the project implementation are not 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 |
| | | | | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |

Leakages are not expected.

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

Leakages related to the project implementation are not 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):**

**The emission reductions are calculated as follows:**

$$ER^y = BE_b^y - PE_p^y, \text{ where:} \quad (16)$$

$BE_b^y$ - baseline emission in period y ($tCO_2e$);

$PE_b^y$ - project emission in period y ($tCO_2e$);

*[y]*- index corresponding to monitoring period;
*[b]* - index corresponding to baseline scenario;
*[p]* - index corresponding to 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"[35]as of 25.06.1991
- Ukrainian Law № 2707-XII «On atmospheric air protection»[36] 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.

[35]http://zakon.rada.gov.ua/cgi-bin/laws/main.cgi?nreg=1264-12
[36]http://zakon.rada.gov.ua/cgi-bin/laws/main.cgi?nreg=2707-12

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 "DZERZHINSKUGOL" 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 adding of actual data to it. |
| $NCV_{b,coal}^y$ | 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 adding of actual data to it. |
| $EF_{p,C,coal}^y$ | Low | Carbon emission factor of 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 adding of actual data to it. |
| $EF_{b,C,coal}^y$ | Low | Carbon emission factor of 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 adding of actual data to it. |
| $OXID_{p,coal}^y$ | 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 adding of actual data to it. |
| $OXID_{b,coal}^y$ | 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 adding of actual data to it. |

**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 "DZERZHINSKUGOL" for implementation of monitoring is given below in scheme.

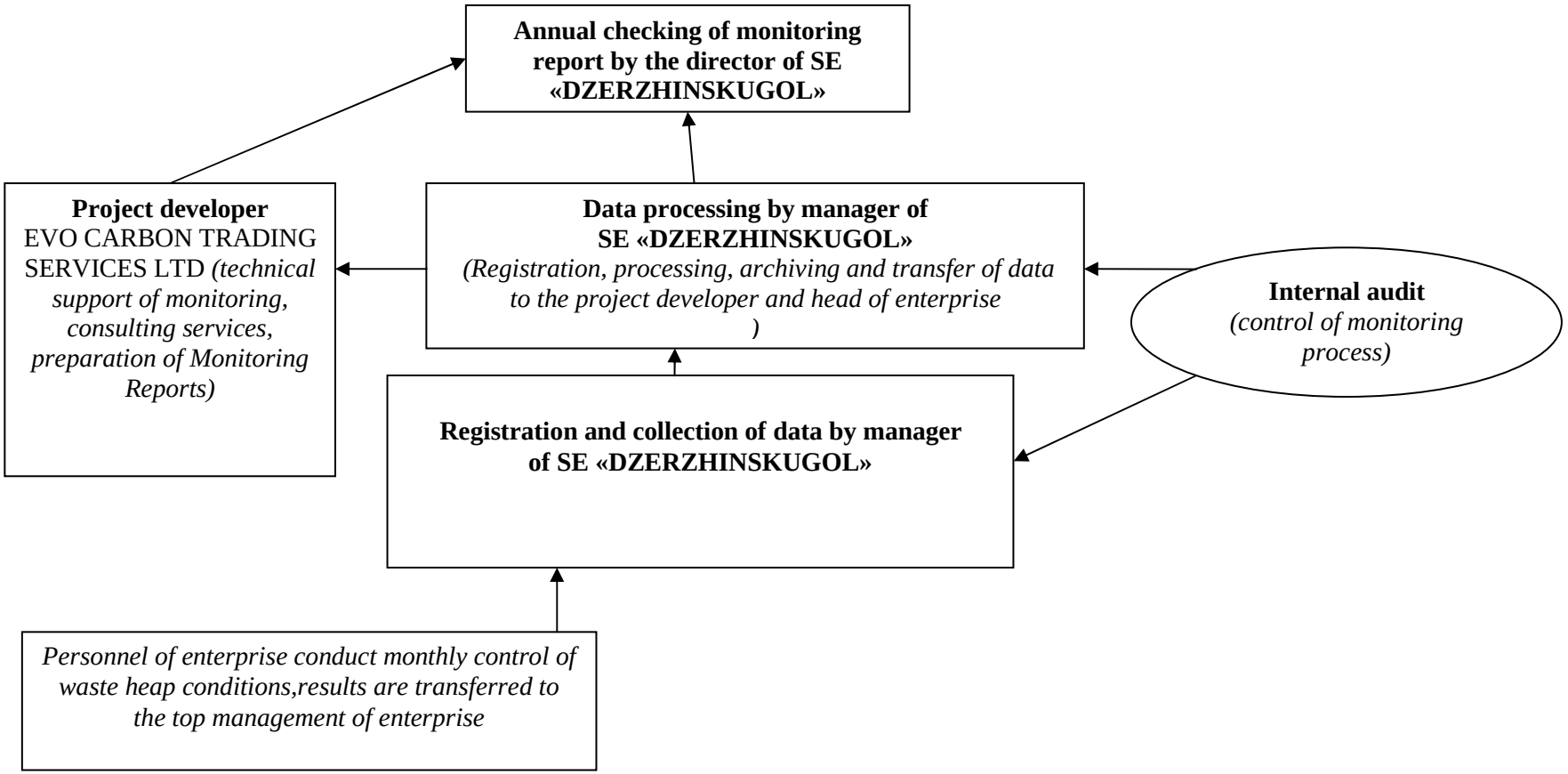


*Fig.7. Structure of collection and processing of data related to JI project*

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

SE «DZERZHINSKUGOL», enterprise that implements JI project.

EVO CARBON TRADING SERVICES LTD, project developer.

CEP Carbon Emissions Partners S.A.

## 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 2006-2011 existing data of SE "DZERZHINSKUGOL" on the actual monitoring parameters values for an appropriate period was used, for the period 2012-2020 predicted data according to the company development plant was used.
Results of calculation are given below in Tables. The calculations are stated in Accompanying document Dzerzhynskiy _v_1.xls, annexed t.o the PDD.

*Table 8. Estimated project emissions for the period preceding the first commitment period (August 1, 2006– December 31, 2007)*

| Source of emissions | Project emissions (t $CO_2$equivalent) | | |
|---|---|---|---|
| | 2006 | 2007 | Total for the period 2006-2007 |
| GHG emissions due to unexpected waste heaps burning after quenching and stabilization | 0 | 0 | **0** |
| Total (t $CO_2$equivalent) | **0** | **0** | **0** |

*Table 9. Estimated project emissions during the first commitment period (January 1, 2008 – December 31, 2012)*

| Source of emissions | Project emissions (t $CO_2$equivalent) | | | | | |
|---|---|---|---|---|---|---|
| | 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 $CO_2$equivalent) | **0** | **0** | **0** | **0** | **0** | **0** |

*Table 10. Estimated project emissions for the period following the first commitment period (January 1, 2013. – December 31, 2020)*

| Source of emissions | Project emissions (t $CO_2$equivalent) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | Total for the period 2013-2020 |
| GHG emissions due to unexpected waste heaps burning after quenching and stabilization | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Total (t $CO_2$equivalent) | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |

Detailed calculations are given in Accompanying documents Dzerzhynskiy _v_1.xls.

## 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 11. Sum of emission from leakages and project activity for the period, preceding the first commitment period (August, 2006.– December 31, 2007)*

| Year | Estimated project emissions (t $CO_{2e}$) | Estimated leakages (t $CO_2$e) | Estimated project emissions and leakages (t $CO_2$e) |
|---|---|---|---|
| 2006 | 0 | 0 | 0 |
| 2007 | 0 | 0 | 0 |
| Total (t $CO_2$equivalent) | **0** | **0** | **0** |

*Table 12. 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 $CO_2$e) | Estimated project emissions and leakages (t $CO_2$e) |
|---|---|---|---|
| 2008 | 0 | 0 | 0 |
| 2009 | 0 | 0 | 0 |
| 2010 | 0 | 0 | 0 |
| 2011 | 0 | 0 | 0 |
| 2012 | 0 | 0 | 0 |
| Total (t $CO_2$equivalent) | **0** | **0** | **0** |

*Table 13. Sum of emission from leakages and project activity for the period, after the first commitment period (January 1, 2013 - December 31, 2020)*

| Year | Estimated project emissions (t $CO_{2e}$) | Estimated leakages (t $CO_2$e) | Estimated project emissions and leakages (t $CO_2$e) |
|---|---|---|---|
| 2013 | 0 | 0 | 0 |
| 2014 | 0 | 0 | 0 |
| 2015 | 0 | 0 | 0 |
| 2016 | 0 | 0 | 0 |
| 2017 | 0 | 0 | 0 |

| | | | |
|---|---|---|---|
| 2018 | 0 | 0 | 0 |
| 2019 | 0 | 0 | 0 |
| 2020 | 0 | 0 | 0 |
| Total (t $CO_2$equivalent) | **0** | **0** | **0** |

## E.4. Estimated baseline emissions:

All results of baseline emissions assessment in the project are provided in Tables 14-16.

*Table 14. Estimated baseline emissions for the period preceding the first commitment period (August 1, 2006– December 31, 2007)*

| Source of emissions | Baseline emissions (t $CO_2$equivalent) | | |
|---|---|---|---|
| | 2006 | 2007 | Total for the period 2006-2007 |
| GHG emissions due to waste heaps burning | 340 748 | 828 910 | **1 169 658** |
| Total (t $CO_2$equivalent) | 340 748 | 828 910 | **1 169 658** |

*Table 15. Estimated baseline emissions during the first commitment period (January 1, 2008 – December 31, 2012)*

| Source of emissions | Baseline emissions (t $CO_2$equivalent) | | | | | |
|---|---|---|---|---|---|---|
| | 2008 | 2009 | 2010 | 2011 | 2012 | Total for the period 2008-2012 |
| GHG emissions due to waste heaps burning | 757215 | 768372 | 761118 | 761118 | 761118 | **3808941** |
| Total (t $CO_2$equivalent) | 757215 | 768372 | 761118 | 761118 | 761118 | **3808941** |

*Table 16. Estimated project emissions for the period following the first commitment period (January 1, 2013. – December 31, 2020)*

| Source of emissions | Baseline emissions (t $CO_2$equivalent) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | Total for the period 2013-2020 |
| GHG emissions due to waste heaps burning | 761118 | 761118 | 761118 | 761118 | 761118 | 761118 | 761118 | 761118 | **6088944** |
| Total (t $CO_2$equivalent) | 761118 | 761118 | 761118 | 761118 | 761118 | 761118 | 761118 | 761118 | **6088944** |

## 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 Table 20-22.

*Table 17. Estimated emission reductions for the period, preceding the first commitment period (August, 2006– December 31, 2007)*

| Year | Emission reductions (t $CO_{2e}$) |
|---|---|
| 2006 | 340 748 |
| 2007 | 828 910 |
| Total (t $CO_2$equivalent) | 1 169 658 |

*Table 18. Estimated emission reductionsduring the first commitment period (January1, 2008– December 31, 2012)*

| Year | Emission reductions (t $CO_{2e}$) |
|---|---|
| 2008 | 757 215 |
| 2009 | 768 372 |
| 2010 | 761 118 |
| 2011 | 761 118 |
| 2012 | 761 118 |
| Total (t $CO_2$equivalent) | 3 808 941 |

*Table 19. Estimated emission reductions for the period, after the first commitment period (January 1, 2013 - December 31, 2020)*

| Year | Emission reductions (t $CO_{2e}$) |
|---|---|
| 2013 | 761 118 |
| 2014 | 761 118 |
| 2015 | 761 118 |
| 2016 | 761 118 |
| 2017 | 761 118 |
| 2018 | 761 118 |
| 2019 | 761 118 |
| 2020 | 761 118 |
| Total (t $CO_2$equivalent) | 6 088 944 |

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

*Table. 20. Table, containing results of emission reductions estimations for the period, preceding the first commitment period (August, 2006– December 31, 2007)*

| Year | Estimated project emissions (t $CO_{2e}$) | Estimated leakages (t $CO_{2e}$) | Estimated baseline emissions (t $CO_{2e}$) | Estimated emission reductions (t $CO_{2e}$) |
|---|---|---|---|---|
| 2006 | 0 | 0 | 340 748 | 340 748 |
| 2007 | 0 | 0 | 828 910 | 828 910 |
| Total (t $CO_2$ | **0** | **0** | 1 169 658 | 1 169 658 |

| | | | | |
|---|---|---|---|---|
| equivalent) | | | | |

*Table 21. Table, containing results of emission reductions estimations during the first commitment period (January1, 2008– December 31, 2012)*

| Year | Estimated project emissions (t $CO_{2e}$) | Estimated leakages (t $CO_{2e}$) | Estimated baseline emissions (t $CO_{2e}$) | Estimated emission reductions (t $CO_{2e}$) |
|---|---|---|---|---|
| 2008 | 0 | 0 | 757 215 | 757 215 |
| 2009 | 0 | 0 | 768 372 | 768 372 |
| 2010 | 0 | 0 | 761 118 | 761 118 |
| 2011 | 0 | 0 | 761 118 | 761 118 |
| 2012 | 0 | 0 | 761 118 | 761 118 |
| Total (t $CO_2$ equivalent) | **0** | **0** | 3 808 941 | 3 808 941 |

*Table 22. Table, containing results of emission reductions estimations for the period, after the first commitment period (January 1, 2013 - December 31, 2020)*

| Year | Estimated project emissions (t $CO_{2e}$) | Estimated leakages (t $CO_{2e}$) | Estimated baseline emissions (t $CO_{2e}$) | Estimated emission reductions (t $CO_{2e}$) |
|---|---|---|---|---|
| 2013 | 0 | 0 | 761 118 | 761 118 |
| 2014 | 0 | 0 | 761 118 | 761 118 |
| 2015 | 0 | 0 | 761 118 | 761 118 |
| 2016 | 0 | 0 | 761 118 | 761 118 |
| 2017 | 0 | 0 | 761 118 | 761 118 |
| 2018 | 0 | 0 | 761 118 | 761 118 |
| 2019 | 0 | 0 | 761 118 | 761 118 |
| 2020 | 0 | 0 | 761 118 | 761 118 |
| Total (t $CO_2$ equivalent) | **0** | **0** | 6 088 944 | 6 088 944 |

## 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

The Host Party for this project is Ukraine. Environmental Impact Assessment (EIA) is the part of the Ukrainian project planning and permitting procedures. Implementation regulations for EIA are included in the Ukrainian State Construction Standard DBN A.2.2.-1-2003 [37] (Title:"Structure and Contents of the Environmental Impact Assessment Report (EIR) for Designing and Construction of Production Facilities, Buildings and Structures").

[37] Ukrainian State Construction Standard DBN A.2.2.-1-2003 ("Structure and Contents of the Environmental Impact Assessment Report (EIR) for Designing and Construction of Production Facilities, Buildings and Structures").

The full scope EIA in accordance with the Ukrainian legislation has been conducted for the proposed project in 2006. Key findings of this EIA are summarized below:

- Impact on air is the main environmental impact of the project activity. Dust emissions due to the erosion and project activity such as loading and offloading operations of input rock and processed coal will be limited. Also emissions from transport will be present during the project operation stage. The impact will not exceed maximum allowable concentration at the edge of the sanitary zone
- Impact on water is minor. The project activity will use water in a closed cycle without discharge of waste water. The possible discharge of the processed water will not have negative impact on the quality of water in the surface reservoirs;
- Impacts on flora and fauna are insignificant. No rare or endangered species will be impacted. Project activity is not located in the vicinity of national parks or protected areas
- Noise impact is limited. Main source of noise will be located at the minimum required distance from residential areas, mobile noise sources (automobile transport) will be in compliance with local standards;
- Transboundary impacts are not observed. There are no impacts that manifest within the area of any other country and that are caused by a proposed project activity which wholly physically originates within the area of Ukraine.

**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:**

The full scope EIA in accordance with the Ukrainian legislation has been conducted for the proposed project in 2006. The findings of the report are summarized in the section F.1. above. The EIA has been reviewed by the competent environmental authorities who have concluded that the project design can be approved. The environmental impact of the project has not been considered significant or prohibitive. Completion of Environmental Impact Assessment reports and positive findings of the competent state authority conclude the procedure of the environmental impact assessment according to the Ukrainian laws and regulations.

## SECTION G. Stakeholders' comments

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

No stakeholder consultation process for the JI projects is required by the Host Party. Stakeholder comments will be collected during the time of this PDD publication in the internet during the determination procedure.

As part of the EIA the stakeholders should be informed through the mass media about the proposed project as suggested by the *State Construction Standard DBN A.2.2.-1-2003 :"Structure and Contents of the Environmental Impact Assessment Report (EIR) for Designing and Construction of Production Facilities, Buildings and Structures"* State Committee Of Ukraine On Construction And Architecture, 2004. All the received comments were positive

Annex 1

**CONTACT INFORMATION ON PROJECT PARTICIPANTS**

**Project owner:**

| | |
|---|---|
| Organization: | State Enterprise «DZERZHINSKUGOL» |
| Street/P.O.Box: | 50 rokiv Zhovtnya st. |
| Building: | 19 |
| City: | Dzerzhynsk |
| State/Region: | Donetsk region |
| Postal code: | 85200 |
| Country: | Ukraine |
| Phone: | +38(06247) 3-43-25, |
| Fax: | +38(06247) 3-43-25 |
| E-mail: | po@du.donbass.com |
| URL: | www.dzerzhinskugol.com |
| Represented by: | |
| Title: | General director |
| Salutation: | Mr |
| Last name: | Zhytlyonok |
| Middle name: | Musiyovych |
| First name: | Dmytro |
| Department: | |
| Mobile: | |
| Phone (direct): | +38(06247) 3-43-25 |
| Personal E-mail | po@du.donbass.com |
| Code in the Unified State Register of Enterprises and Organizations of Ukraine | 33839013 |
| Type of activity | 05.10 **Stone coal mining**<br>85.32 Professional and technical education<br>46.71 Wholesale trade of fossil fuel<br>71.12 Geological and geodesic activities |

**Project developer:**

| | |
|---|---|
| Organization: | EVO CARBON TRADING SERVICES LTD |
| Street/P.O.Box: | High Road |
| Building: | 869 |
| City: | London |
| State/Region: | |
| Postal code: | N12 8QA |
| Country: | United Kingdom |
| Phone: | + 44 7500828771 |
| Fax: | + 44 7500828771 |
| E-mail: | www.evocarbontrading.co.uk |
| URL: | negorova@evocarbontrading.co.uk |
| Represented by: | |
| Title: | |
| Salutation: | Egorova |

| | |
|---|---|
| Last name: | Lvivna |
| Middle name: | Nataliya |
| First name: | |
| Department: | + 44 7500828771 |
| Mobile: | + 44 7500828771 |
| Phone (direct): | |
| Personal E-mail | |

| | |
|---|---|
| Organisation: | CEP Carbon Emissions Partners S.A. |
| Street/ P.O. Box: | Route de Thonon |
| Building: | 52 |
| City: | Geneva |
| State/Region: | |
| Postal code: | Case postale 170 CH-1222 Vésenaz |
| Country: | Switzerland |
| Phone: | +41 (76) 3461157 |
| Fax: | +41 (76) 3461157 |
| E-mail: | 0709bp@gmail.com |
| URL: | |
| Represented by: | |
| Title | Director |
| Salution | |
| Last Name | Knodel |
| Middle name: | |
| First Name: | Fabian |
| Department: | |
| Phone (direct): | +41 (76) 3461157 |
| 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 selecting the baseline and monitoring." (version 3) 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», in 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», in 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», in the baseline scenario, (relative unit); | 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 |
| $\rho_n$ | Density of waste heap at the moment of its quenching and stabilization | 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 «DZERZHINSKUGOL», 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 Ukraine for 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

Monitoring plan of the project is provided in Section D of this PDD.