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

CONTENTS

Annexes

SECTION A. General description of the project

A.1. Title of the project:

Waste Heaps Dismantling of “RIGHT” LLC with the Aim of Decreasing the Greenhouse Gases Emissions into the Atmosphere

The sectoral scope: (8) Mining/mineral production

The version number of the document: 2.0

The date of the document: 3th of August 2012

A.2. Description of the project:

The purpose of the proposed project is dismantling and beneficiation of rock mass of the mine “Schehlivska-Hlyboka” in Makiivka, Donetsk region, Ukraine with the aim to prevent greenhouse gas emissions into the atmosphere during combustion of the waste heaps. Thus, according to the project scenario, coal extracted from the waste heaps will partially substitute coal from mines, thus reducing fugitive methane emissions, as well as decreasing energy consumption necessary for coal production in the mine and reducing greenhouse gas emissions caused by burning of the waste heaps because of extraction all combustible materials from them.

Situation before the project implementation

Ukraine is one of the largest coal mining countries. The largest deposits of black coal are located in the Donetsk coal basin, which is an industrial region of Ukraine, covering Donetsk region without Priazovye, east of Dnepropetrovsk region, south of Lugansk region of Ukraine. The main centres of coal production are Donetsk, Makiivka, Krasnoarmiysk, Lysichansk, Horlivka, Pavlograd, etc. The territory of Ukraine has about 167 operating coal mines and 3 strip mines, mines that are currently under decommissioning, as well as enterprises for coal beneficiation, transport enterprises and others.

Coal is found in the area of Donbas at the average depth of 400-800 m, and 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 Donbas waste heaps 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. According to specialists’ research, percentage of combustible material in waste heaps is 15-30%; meanwhile there can be from 7% to 28-32% of coal[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. Ground water is contaminated with solid particles, becomes hard and acid when it contacts a waste heap. Erosion processes that often destroy the integrity of the waste heaps are responsible for contamination of nearby areas with particles that contain hazardous materials (like sulphur).

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

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 from 5 to 7 years.

In addition, waste heaps occupy significant plane. As of 2002 heaps occupied plane at 7190 hectares in Donbas, and this index trends to increase.

Baseline scenario

The baseline scenario of the proposed project assumes that in practice neglecting of measures for extinguishing waste heaps will continue and they will burn and lead to greenhouse gas (GHG) emissions into the atmosphere until the whole amount of coal will not be burnt in it. Due to the use of improved production technology, which is proposed in this project, residual coal can be extracted from the waste heaps and this coal can be used in order to generate energy for thermoelectric power stations or in households. The coal extracted under the project will substitute that coal that was produced by mining thus causing fugitive methane emissions during extraction and causing additional consumption of electricity in mines.

Project scenario

The project “Waste Heaps Dismantling of “RIGHT” LLC with the Aim of Decreasing the Greenhouse Gases Emissions into the Atmosphere” is a project that envisages implementation of a number of works at the sites close to the waste heap, which is formed by the mine “Schehlivska-Hlyboka” of Shakhtoupravlinnya “Donbas” as follows:

- Building of the complex of beneficiation plant in order to process one existing waste heap (cone);
- Beneficiation of coal and rock mass in order to obtain ROM coal;
- Formation of new flat heaps from processing waste on the site of dismantled heaps.

According to the project, implementation of the full cycle for beneficiation of coal and rock mass from extraction of coal from the waste heaps to loading as an end-product in automobile transport is prescribed. In addition to the extraction of coal from the waste heaps, project activity also includes formation new flat heaps from the processed material at the released area of the processed heaps. According to the project complex for processing the waste heaps processes up to 756 thousand tons of rock substance per year in order to extract low-ash coal concentrate.

Coal extraction from the mine’s waste heaps will prevent greenhouse gas emissions into the atmosphere as if in the case of spontaneous burning and will produce additional amount of coal instead of its mining. Emission reductions due to the implementation of this project will come from three major sources:

- Removing the source of green-house gas emissions from spontaneous combustion of the waste heap by the extraction of black coal from it;
- Removing fugitive methane emissions connected with the mining of black coal by replacing black coal, that would have been mined, by the black coal extracted from the heap under the project activity;
- Reducing electrical energy consumption during waste heap dismantling comparing with energy consumption during extraction of the same amount of coal from mine.

History of the project

For achievement of the project aim the development of the project documentation for installation of waste heap processing was initiated in 2004. Building started in the second half of 2004 beginning from formation of foundations and preparation of the site. At the beginning 2007 installation of the main production equipment started.

As this project leads to reduction of greenhouse gas emissions, then such reduction was obligatory taken into account during the making decision on the project implementation. Emission reductions will be sold as ERUs at the international trade market of emission reductions, and received money will improve the financial performance of the project up to the level that justifies the means that were used in its implementation. From the very beginning joint implementation mechanism was one of the prominent factors of the project and financial benefits under this mechanism play an important role in decision making concerning the start of the operation and are considered one of the reasons of project start.

A.3. Project participants:

Table 1. 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)	• RIGHT LLC	No
Netherlands	• OHANA LLP	No

OHANA LLP is a project participant and potential buyer of ERUs under the project. Detailed contact information is provided in Annex 1.

“RIGHT” LLC is Host party of the project and a project participant. “RIGHT” LLC is the owner of the emission source, where realization of the joint implementation project is planned. The company started active work in Ukraine in 2000. It is engaged in processing of the waste heaps of the Donetsk coal basin since 2004. The project of “RIGHT” LLC is a project on waste heaps dismantling, coal separation, land recultivation on the site of heaps for further development of the area. “RIGHT” LLC buys bulk materials of the waste heaps of Shakhtoupravlinnya “Donbas”. Detailed contact information is provided in Annex 1.

A.4. Technical description of the project:

A.4.1. Location of the project:

Project is located in Makiivka, Donetsk region, Ukraine. Beneficiation plant, transport and waste heap are within the project boundary.

A.4.1.1. Host Party (ies):

Ukraine.

Ukraine is the Eastern European country that ratified the Kyoto Protocol to the Framework UN Convention on February 4, 2004, is included in the list of countries of Annex 1, and meets the requirements for participation in Joint Implementation projects.

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

Donetsk Region

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

Makiivka.

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

Figure 1 Map of Ukraine and location of the project site

The project is implemented within Donetsk region of Ukraine, where the waste heap and beneficiation plant for dismantling of these heaps are located: Donetsk region, Makiivka. Makiivka is a city of regional subordination in Ukraine, Donetsk region; in fact, it is the north-east suburb of Donetsk. It belongs to 15 largest cities of the country by population. As of January 1, 2011 population of Makiivka was 358,156 inhabitants. The first settlement at the area of modern Makiivka was founded in 1690. Makiivka is located in the south-eastern part of Ukraine at the distance of 13 km from the regional centre of Donetsk and 713 km from the capital of Ukraine, Kyiv. Geographical coordinates of the site of the project location: +48° 3' 47.16", +37° 51' 27.14"

Satellite photo of the site is shown below in Figure 2.

Figure 2. The site of the project location

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

Recently, there is a tendency of growing popularity of dry methods of separation and beneficiation of different bulk materials. Application of the method vibration-pneumatic separation allows creating compact and mobile beneficiation installations with a constant cycle of work. These installations have opportunity of operative management and regulation of the main technological parameters of the beneficiation process. Great advantage is independence of beneficiation system from the water resources and communicational facilities of warehousing highly moist products; this is important positive factor of installations location in the sites with limited access to hydro resources. Application of this beneficiation method is very important for this area, because the territory of Donbas has limited water resources because of geographical location. In addition, keeping of water management in the production requires a large territory and significant funds for its service. Dry method of coal beneficiation excludes the possibility of pollution of hydro system of environment, because it does not require the use of water.

Complex for processing the waste heaps is located in Makiivka, Donetsk region, the same place where the waste heap is located. "RIGHT" LLC buys raw materials (rock) in Shakhtoupravlinnya "Donbas", of the mine "Schehlivska-Hlyboka" under concluded agreement. Thermal coal of anthracite and gas brand groups will be extracted from the waste heap under the project; they will be used as energy raw materials for energy generation at thermal power plants.

The structure of technological complex for processing of coal and rock mass was taken, considering stable operation of all links of technological scheme of the reception, preparation, beneficiation, shipment of commercial products and waste. Technological complex of processing point includes the following buildings and facilities:

- trestle for the scraper conveyor;
- collection point for coal and rock mass;
- classification point;
- installation of pneumatic separator;
- point of loading concentrate;
- trestles #1,2,3,4,5.

Figure 3: The waste heap that is being dismantled in the project

General view of beneficiation plant is shown in Figure 4.

Figure 4: View of beneficiation plant for waste heap processing that is being dismantled in the project

Packaging of facilities of point for processing coal and rock mass in technological complex provides available thoroughfare to the industrial site and entrances of mobile hoisting equipment for repair works.

Raw material base for beneficiation complex is bulk materials, transported from the waste heap. These raw materials are processed to obtain primary and coal concentrate 0-50mm. But the construction of certain components of beneficiation plant make it possible to enrich ROM coal of fraction up to 75mm. Operation mode of beneficiation plant depends on the size of raw material that is transported by trucks from the waste heap.

The main element of beneficiation plant is pneumatic separator SVP-5, 5×1. Pneumatic separator SVP-5, 5 × 1 is developed by “Lugansk Machine-Building Plant named after A. Parkhomenko” LLC and is intended for beneficiation of coal, ores and other bulk materials with bulk density up to 2.8 t/m^3, surface moisture up to 8% and material size up to 75mm. Depending on the characteristics of coal and rock mass, separator structure allows to implement different schemes of division into two or three products: concentrate, middlings and wastes of beneficiation.

Technical characteristics of pneumatic separator SVP-5, 5×1 is given below:

Table 2. Technical characteristics of pneumatic separator SVP-5, 5×1

List of parameters	Value
Working area of separation, m^2	6.7
Nominal width of the deck, m	1.42
Productivity on the original material (including circulating load), t/h	150
Size of beneficiation material, mm	up to 75
Uncertainty of separation (at maximum efficiency), not more	0.25
Range of controlled and regulated frequency of deck oscillation, Hz (min^{-1})	5.0-6.67 (300-400)
Dimensions, mm, not more: - length - width - height	 6450 3906 7750
Specific electricity consumption, kW/t	4.06
Weight, kg, not more	12570
Power consumption of control system, kW, not more	0.5
Dynamic loads, transferred to building structures through separator resistance, kN, not more: - vertical - horizontal	 8 6

Beneficiation plant includes such elements:

- pneumatic separator SVP-5, 5×1;
- smoke exhauster DN-17;
- ventilator VDNu-12.5;
- cyclone CN-24;
- screen HYL52A.

In separator construction pulsating supply of process air under perforated deck is used. Principle of operation and separator construction allows receiving quality of beneficiation products (with separation of two or three products) in accordance with the requirements of the consumer. Distribution of ash in the flow of is growing differentially around the perimeter of the loading part of deck and repeats the law of distribution and output of factions of incoming raw materials.

Coal beneficiation takes place on the sloping decks of the perforated work surface that bobs, through the holes of which air is blown. The air under deck goes with the help of technological ventilator through air duct is divided into pipes and diffusers in the upper part. The number of pipes and diffusers corresponds to the number of air zone of separator. Dusty air is removed through the chimney hood.

Deck construction provides possibility to change its angle of inclination in the transverse and longitudinal directions. On the deck of separator there are guides (riffles), made from steel strips of different heights. Riffles have the biggest height in the zone of concentrate unloading. The height of the guides gradually decreases as in longitudinal and in the transverse directions; in the zone of shipment of waste it is minimal. Through the device that loads the material, coal and rock mass goes on the deck of separator, where with the help of the feeder it is distributed, forming bed.

Deck is installed on inclined supports, making rotation and translational motion (swing), due to that bed moves by inertia upward in the direction, perpendicular to the plane of resistance. As a result of such vibrations and simultaneous influence of air flow, bed material fluffs and gets "fluidity".

Due to inclination of the deck in the transverse direction and translational movement of bed, layer of light particles, which is located higher than the guides, gradually "slides down" down at an angle to the axis of the separator and unloads along its rim in the front part of the deck. The lower layers of bed that are between the guides are moving along them. Products are uploaded on the perimeter separator.

Beneficiation complex of coal and rock mass, based on vibration pneumatic separator SVP-5, 5×1, is part of modular facilities for processing materials from coal.

According to the project, implementation of the full cycle for beneficiation of coal and rock mass from extraction of coal from the waste heaps to loading as an end-product in automobile transport is prescribed. In addition to the extraction of coal from the waste heaps, project activity also includes formation new flat heaps from the processed material at the released area of the processed heaps. According to the project complex for processing the waste heaps processes up to 756 thousand tons of rock substance per year in order to extract low-ash coal concentrate.

Project capacity of beneficiation complex is based on productivity and operation mode of project equipment:

- number of business days in a year – 315;
- number of shifts – 2;
- number of hours per shift – 8;
- per hour productivity, t – 150;
- daily productivity, t – 2400;
- annual capacity, thsd t – 756.

Technological scheme of work at area for processing of rock mass can be presented as follows:

- reception of rock mass from transport;
- transfer of coal and rock mass by scraper conveyor to the collection point;
- accumulation of coal and rock mass in the bunker with capacity of 30 tons;
- transfer of coal and rock mass by belt conveyor to the classification point;
- control classification of coal and rock mass on screen;
- transfer of coal and rock mass of class 0-50mm by belt conveyor to the installation of pneumatic separator;
- transportation of coal and rock mass of class >50mm by belt conveyor after classifier for the loading in vehicles, in case of such fraction;
- beneficiation of coal of class 0-50mm in pneumatic separator;
- transportation of coal concentrate by belt conveyor to the shipment point;
- accumulation of coal concentrate in the bunker with capacity of 10 with further loading into transport;
- transportation of beneficiation wastes by belt conveyor to the loading into transport.

Percentage of coal of +50 mm fraction is low after beneficiation plant because of the modern technology of coal and rock separation. This parameter is not specifically controlled, but the technology provides its safe value. The fraction of +50mm is inert mass which is the waste of the main production in this project and is directed to recultivation and formation of a new flat heap, the state of which is controlled.

The scheme of processing of coal and rock mass 0-50mm is the following: rock substance is transported from the waste heap to the collection point. Then feedstock output is loaded by scraper conveyor to the bunker with capacity of 30 tons. The structure of bunker includes a special sieve, through which there is previous classification of rock >100mm. With the help of the special feeder and belt conveyor, rock 0-100mm is supplied to the classification point (screen), where the separation of rock into classes 0-50mm and >50mm is done.

Rock mass >50 mm is removed from the technological process, sent to the trestle #3, where by means of the belt conveyor it is loaded into a truck and transported to another industrial site, where it is grinding, after that the material returns to the technological process.

After classification, material 0-50mm is sent to the trestle #2, where by means of the belt conveyor it is transported to the bunker with capacity of 15 tons, installed in order to provide sustainable, quality indicators of beneficiation of coal and rock mass and minimal losses of coal with wastes of beneficiation. Then using feeder, raw materials of class 0-50mm, which provides continuous and uniform supply in pneumatic separator, go to beneficiation in pneumatic separator.

The scheme of location and interaction of all elements of beneficiation complex is shown in Figure 5.

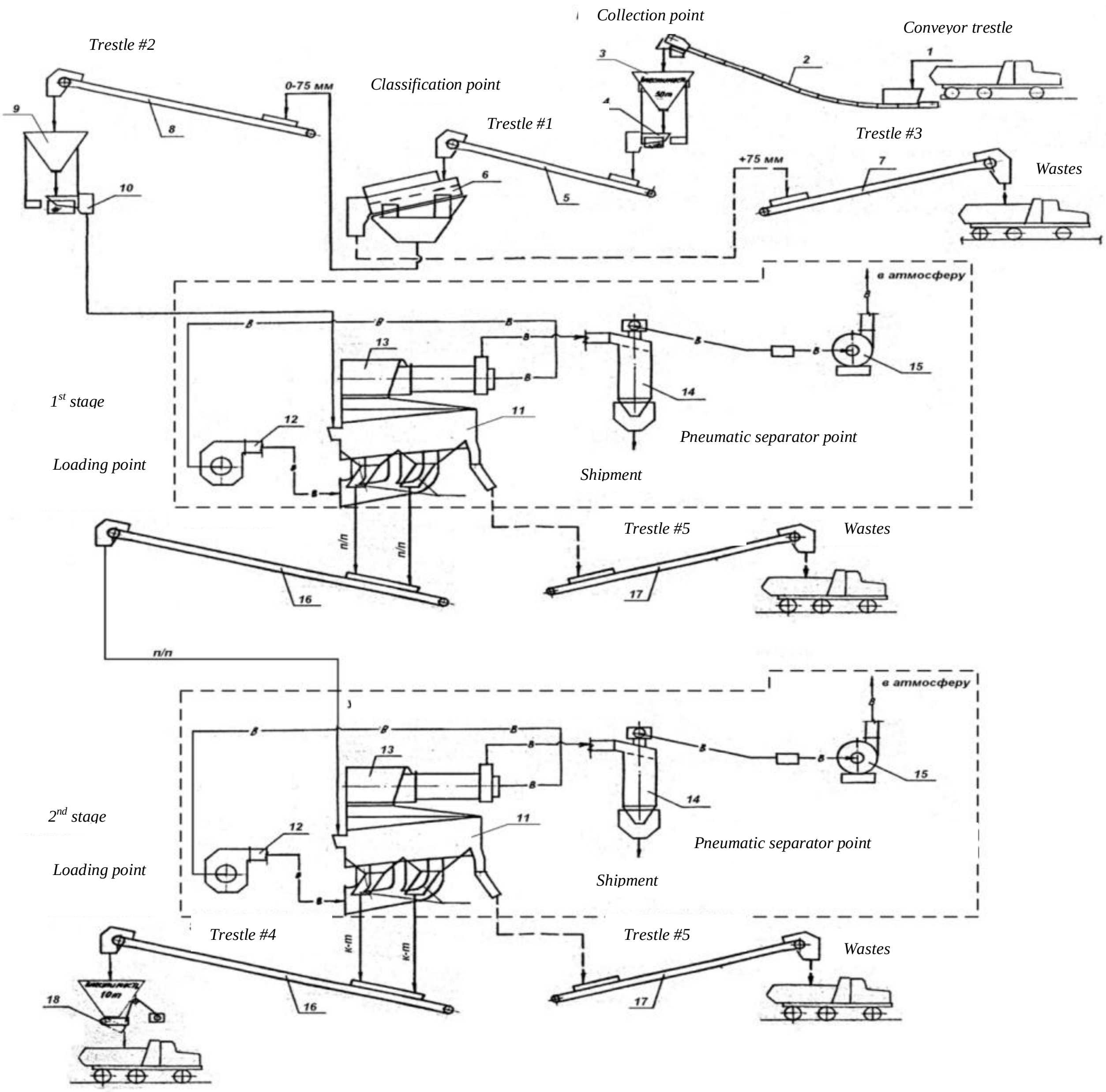


Figure 5: Principal technological scheme of modular installation

The separator is intended for beneficiation of coal, ores and other bulk materials with bulk density up to 2.8 t/m^3, surface moisture up to 8% and material size up to 75mm. Work of the separator is based on division of coal and rock mass, mineral particles and their splices according to the density under the influence of air flow and vibration. Depending on the characteristics of coal and rock mass, separator structure allows to implement different schemes of division into two or three products: concentrate, middlings and wastes of beneficiation. Beneficiation process consists of two stages. During beneficiation process of coal and rock mass primary (first stage) and coal concentrate are (second stage) are received.

In order to receive concentrate of low ash content beneficiation process coal and rock mass in pneumatic separator is done in two phases. I. e., primary product of beneficiation returns to the pneumatic separator, which switches to another mode, at the same time, angle of inclination of the deck, the frequency of oscillation and electric load settings change. Accumulation of concentrate is done in the bunker with capacity of 10 tons. Uploading of coal in transport is realized using the shutter. Wastes of beneficiation are transported for shipment directly into the transport by the belt conveyor, which is installed on trestle #5.

Technology of beneficiation coal and rock mass also provides two-phasic scheme of dust catcher:

- first phase: in spiral dust-divider of the separator for cleaning of the process air from dust, circulating in air system of the separator;
- second phase: in cyclone of type CN-24.

The flow of air from smoke exhauster DN-17 goes through air pipe and pulsator under deck of separator. Main part of air (up to 81.5%) goes through dust removal in it and again through smoke exhauster comes under the deck of separator. Part of remaining air goes through dust removal in cyclone of CN-24 type and with the help of exhaust ventilator of VDNu-12.5 type is emitted into atmosphere. Coal concentrate and beneficiation wastes are transported to shipment by conveyor belt with belt width – 800mm from the installation of pneumatic separator.

Most part of the equipment within this project, such as trucks, excavators, bulldozers refers to the standard type of industrial equipment used worldwide. Project works will require limited number of individually ordered equipment.

In 2006, development of project documentation for this installation of waste heaps processing within this project was initiated. Date of commissioning of this installation for waste heaps processing is January, 2008. Plan of project implementation is shown below:

Table 3. Schedule of the project implementation

Main stages of project implementation	Data
Decision-making	10.01.2004
Beginning of investment project phase	16. 11.2006
End of investment project phase	28.06.2007
Beginning of operational project phase	01.01.2008
End of operational project phase	01.01.2020

According to the balance of beneficiation products under the project, estimated coal content in the material for processing is approximately 23%. Nominal power of facilities for waste heaps dismantling is 756 thousand tons of rock substance per year.

The project does not require intensive pre-training. Required number of staff can receive basic training on the project site. Most workers, such as operators of heavy equipment, truck and excavators drivers, mechanics and electricians work on the project site. Project needs in technical maintenance are met by local resources: own employees for internal maintenance and contractors for repair. The project provides training. All employees must have valid professional certificates, to undergo periodically safety training and pass exams.

They can get professional education in all professional spheres, required for this project, on site in Donetsk region, Makiivka.

Important stage of this project is also recultivation of lands that were occupied by waste heaps, and their return to community. Waste from beneficiation complex (empty rock) can be used in the construction of roads and for formation of the territory of abandoned open developments and pits in order to reuse these sites. This part of the project is obligatory but totally expensive, because of this joint implementation mechanism was one of the prominent factors of the project from the very beginning, and financial benefits under this mechanism were considered as one of the reasons of project beginning.

Technological process is environmentally justified and does not require the use of hazardous materials.

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 project activity proposes conducting coal mining from waste heap of coal mine in order to prevent greenhouse gas emissions because of self-heating. The proposed project also assumes that coal extracted from the waste heap will substitute coal that must be produced by mining. These measures are very important for the region of Ukraine - Donbas, as during coal mines activities on the territory of Donetsk region a very large number of waste heaps formed that often inclined to self-heating and subsequent burning, causing emissions of hazardous substances and greenhouse gases. The fraction of coal in the waste heaps can be as high as 28-32%[2], so the risk of spontaneous self-heating and burning is very high. The survey shows[3], 83% of waste heaps in the Donetsk region are, or have been burning. 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. Preventing from burning of a waste heap includes extraction of all the combustible matter, which are in residual coal after mining process.

The problem of waste heaps is very actual in Donbas nowadays. Waste heaps not only withdraw considerable land areas from economic turnover and lead to disruption of ecological balance of natural biocenosis, but also are a source of high ecological hazard. Even in non-burning condition waste heap is a source of pollution of the atmosphere, soil, nearby water bodies and groundwater. This risk is increased many times during combustion of the waste heap[4]. Processing of the waste heap will give an opportunity to avoid burning, improve ecological situation in the region, and significantly reduce CO_2 emissions and other hazardous substances. Waste heaps dismantling will reduce the probability of groundwater contamination. Area of lands for agricultural activities and for other purposes will increase.

Coal, extracted from the waste heaps, will substitute the coal from mines and will be used to generate electricity at power plants and for coke for other needs of industry. In addition, extraction of coal from waste heap provides less electricity consumption from power grid of Ukraine than during mining. Also, additional amount of coal without the need of being mined will be received, and the leakages of methane caused by coal

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

[3] *Report on the fire risk of Donetsk Region's waste heaps,* Scientific Research Institute "Respirator", Donetsk, 2012

[4] http://terrikon.donbass.name/ter_s/290-model-samovozgoraniya-porodnyx-otvalov-ugolnyx-shaxt-donbassa.html

mining will be avoided. Emissions reductions can be sold as Emission Reduction Units (ERUs) in the international carbon units market.

Emission reductions resulting from this project will come from three main sources:

- Removing of greenhouse gas emissions source from self-heating of the waste heap by mining coal from it;
- Removing fugitive methane emissions because of coal mining by substitution of the coal from the mine to the coal extracted from the waste heap under the project activity;
- Reduction of energy consumption during waste heap dismantling compared to energy consumption during extraction of the same amount of coal from mine.

The process of waste heap dismantling is very expensive, the investment effect of which is lower than capital investment. There are also many other negative factors in realization of such measures, such as uncertainty of early coal content in the total rock mass, instability of sales market of coal production in Ukraine. Besides, Ukraine does not resolve this issue on a systematic basis. Efforts to stop waste heaps burning and their full dismantling, corresponds the current Legislation of Ukraine on Environmental Protection. Proposed project is positively estimated by local authorities.

Detailed description of the baseline and full analysis of additionality are given in Section B of this project development document.

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

Table 4. Estimated amount of emission reductions over the crediting period

	Years
Length of the crediting period	5
Year	Estimate of annual emission reductions in tonnes of CO_2 equivalent
Year 2008	990 836
Year 2009	399 884
Year 2010	306 499
Year 2011	330 802
Year 2012	174 540
Total estimated emission reductions over the crediting period (tonnes of CO_2 equivalent)	**2 202 561**
Annual average of estimated emission reductions over the crediting period (tonnes of CO_2 equivalent)	**440 512**

Table 5. Estimated amount of emission reductions over the crediting period

	Years
Length of the period after 2012, for which emission reductions are calculated	8
Year	Estimate of annual emission reductions in tonnes of CO_2 equivalent
Year 2013	437 118
Year 2014	437 118
Year 2015	437 118
Year 2016	437 118
Year 2017	437 118
Year 2018	437 118
Year 2019	437 118
Year 2020	437 118
Total estimated emission reductions over this period (tonnes of CO_2 equivalent)	**3 496 944**
Annual average of estimated emission reductions over this period (tonnes of CO_2 equivalent)	**437 118**

Length of the crediting period during the first commitment period under the Kyoto Protocol is 5 years or 60 months in this project.

A.5. Project approval by the Parties involved:

Letter of Endorsement No. 2023/23/7 dated 27.07.2012 was issued by State Environment Investment Agency of Ukraine.

According to the national Ukrainian procedure Letter of Approval from Ukraine is expected after determination of the project.

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)[5], 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)[6] (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; or, if necessary, approved CDM methodologies or methodological tools.

The baseline will then include description and justification in accordance with the "Guidelines for users of the Joint Implementation Project Design Document Form", version 04[7], 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 already taken in comparable JI cases (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 should be established in accordance with Annex B JI guidelines. In addition, the baseline should be determined by listing and describing the possible future scenarios based on conservative assumptions and choice most plausible from them. Taking into account JI special approach selected for determining the baseline, in accordance with Article 24 of JISC Guidelines, baseline is identified by listing and describing possible future scenarios based on conservative assumptions and choosing one of the most possible.

To determine the most possible future scenario barrier analysis was used.

After analyzing all variants development of the baseline, two scenarios were identified, one of which reflected the project scenario with JI initiatives. To demonstrate additionality of the project clear and transparent information was provided about similarity of approach of additionality demonstration, it was used

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

in those cases where the final determination of the project was held, with the help of which comparative analysis can be performed.

Description of the possible future scenarios of the baseline are based on the following key factors: policies and legislation, directed to reforming of this sector of industry, economic situation in the country and socio-demographic factors in the relevant sectors, stability of demand on coal market, investment, fuel prices and its availability, national and/or subnational expansion plans for the energy sector.

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 the existing situation

The problem of self-heating and subsequent burning of waste heaps is very actual nowadays. Waste heaps are not utilised, and extinguishing measures are held from time to time. Coal from the waste mass is not produced from the waste heaps leading to sources of uncontrolled GHG emissions. Coal, produced by underground mines, causes fugitive emissions of methane during the extraction as well as the formation of new waste heaps.

Scenario 2. Direct energy production from the heat energy of burning waste heap.

In certain circumstances burning waste heaps are not extinguished and their condition is not monitored properly. In some cases, for the use of thermal energy of the waste heaps [8] special heat exchangers of stationary type are used, that have direct contact with centre of coal and rock mass combustion. Thus, received thermal energy can be used to generate electricity and heat. However, this approach does not exclude greenhouse gas emissions into the atmosphere by burning of the waste heaps. Coal will continue to be produced by underground mines and used for energy sectors purposes. Mining activities result in fugitive gas release, and the formation of more waste heaps.

Scenario 3. Production of construction materials from waste heap matter

Waste heaps are being processed in order to produce construction materials (bricks, panels, etc.). Coal in the waste heap matter is burnt during the agglomeration process[9]. Coal is produced by underground mines of the region and used for energy production or other purposes. Mining activities result in fugitive gas release, and the formation of more waste heaps.

[8] *Method to utilize energy of the burning waste heaps*, Melnikov S.A., Zhukov Y.P., Gavrilenko B.V., Shulga A.Y., State Committee Of Ukraine For Energy Saving, 2004 (http://www.masters.donntu.edu.ua/2004/fgtu/zayanchukovskaya/library/artcl3.htm)

[9] *Opportunities for international best practice use in coal mining waste heap utilization of Donbas*, Matveeva N.G., Ecology: Collection of Scientific Papers, Eastern Ukrainian National University, Lugansk, #1 2007 http://www.nbuv.gov.ua/portal/natural/Ecology/2007_1/Article_09.pdf

Scenario 4. Coal extraction from waste heaps without JI incentives from implementation of JI project

Situation under this scenario is identical to the project scenario only, the project itself does not benefit from the terms of implementation of JI project. Waste heaps are processed in order to extract coal and use it in the energy complex of industry, due to this less coal is produced by underground mines of the region.

Scenario 5. Systematic monitoring of waste heaps condition, regular fire prevention and application of extinguishing measures

Waste heaps are systematically monitored and its thermal condition is observed. Regular fire prevention measures are taken. In case of burning of waste heap fire is extinguished and measures to prevent burning in the future are held. In this case coal extracted from the waste heaps is not used for energy production, and the whole amount of coal is produced by underground mines that result in fugitive methane release and formation of more waste heaps.

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: Implementation of appropriate measures in practice has not been implemented; therefore this technology of heat energy use is just experimental. Besides, the implementation of this technology requires close proximity of the waste heap to the consumer, or additional construction of energy supply system, in the case of significant distance between the objects. In practice, this technology can show more flaws and bottlenecks, because the use of heat pumps for energy production entails a multifaceted model of various internal and external factors, associated with technical[10] difficulties. In addition, the technology does not allow to control and manage the burning of rock mass and hence the gas emissions. This technology was proposed only as a theoretical model that has not yet entered the phase of implementation.
Investment barrier: Considering the fact that this technology is in its initial phase of the experiment, investment into this project results in a high risk besides Ukraine is ranked as a high-risk country[11]. Investments into such kind of unproven energy projects unlikely to attract investors more than some other investment opportunities into energy industry with higher profitability. The pioneering character of the project may interest programmes of technical support and governmental incentives, but the cost of the produced energy is likely to be much higher than that of the alternatives.

Scenario 3. Production of construction materials from waste heap matter

Technological barrier: This scenario is based on known technology, which, however, is not currently available in Ukraine and there is no evidence that such projects will be implemented in the near future. It is also not suitable for all types of waste heaps as the content of waste heap has to be predictable in order for

[10] *Studies of the possibility of using geothermal heat pumps (GHP) using heat of waste heaps soil for autonomous heat supply, S. I. Monah, R. E. Baftalovskyy*, Donbas National Academy of Civil Engineering and Architecture, b.4, 4, No.3, 2008, p. 113-118 http://www.nbuv.gov.ua/portal/natural/spcb/2008-3/SPGS2008-3/01_Monakh.pdf
[11] AMB Country Risk Report: Ukraine October 29, 2010 http://www3.ambest.com/ratings/cr/reports/Ukraine.pdf

project owner to be able to produce quality materials[12]. High content of sulphur and moisture can reduce the suitability of the waste heap for processing. A large-scale and detailed exploration of the waste heap has to be performed prior to the start of the project. Pilot projects of this type are implemented only with the support of public funding[13].

Scenario 4. Coal extraction from waste heaps without JI incentives from implementation of JI project

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

Scenario 5. Systematic monitoring of waste heaps condition, regular fire prevention and application of extinguishing measures

Technological barrier: Among the well-known methods to assess the scale of the problem and choose the best direction of fire suppression are: drilling, application of an inert material, injection of inhibitors, compaction, pumping of water, timely reclamation, and recycling. The major drawbacks of these technologies include: difficulties with determination of exact location of self-heating and burning points; lack of special techniques and equipment (e.g. bulldozers and excavators); additional burden on the environment (emissions, dust, smoke); waste heap is not in working condition at the site of work; the lack of guarantees for quick elimination of fire; complication of working conditions; insufficient water can act as one of the factors intensifying the combustion, etc[14].

Investment barrier: This scenario does not represent any revenues but anticipates additional costs for waste heaps owners. Monitoring of the waste heap status is not carried out systematically and actions are left to the discretion of the individual owner of the waste heaps. Mainly waste heaps belong to mines or regional coal mining associations. Coal mines in Ukraine suffer from limited funding resulting in safety problems due to complicated mining conditions and financial constraints with miners' salaries often being delayed by few months. In this case waste heaps are considered as an additional burden, and mines usually do not make even minimum measures required. Self-heating and burning of heaps are common practice. Exact statistics are not always available. From a commercial view point the fines that are usually levied by the authorities are considerably lower than the costs of all the measures outlined in this project.

Sub step 2d. Baseline identification

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

In accordance with the laws and legal norms of Ukraine waste heaps are the source of possible dangerous emissions into the atmosphere. Measures on extinguishing and monitoring of fire-hazardous waste heaps are regulated by "Mine Safety Rules"[15]. In practice, the legal use of this document is not significant because in

[12] *Opportunities for international best practice use in coal mining waste heap utilization of Donbas*, Matveeva N.G., Ecology: Collection of Scientific Papers, Eastern Ukrainian National University, Lugansk, No.1 2007 http://www.nbuv.gov.ua/portal/natural/Ecology/2007_1/Article_09.pdf
[13] http://www.rostovstroy.ru/archive/articles/1164.html
[14] http://www.imcmontan.ru/team/publication/coal.pdf
[15] Chapter IX, Article 7, NPAOP 10.0-1.01-10 Mine Safety Rules. Order No.62 State Committee of Ukraine on industrial security, labour protection and mining supervision – 22/03/2010 http://zakon1.rada.gov.ua/cgi-bin/laws/main.cgi?nreg=z0398-10

certain cases These measures are regulated by Code of Ukraine on Administrative Violations that in Article 41 provides maximum penalty for such violation[16] only 10 non-taxable minimum incomes, i.e. subsistence level according to Tax Code (Section 1, Article XX section 5 and section IV of article 169.1.1)[17,18, 19] and is 1044 hrn as of [20] July 1, 2012. Thus, the maximum penalty is 10 440 hrn (1034 Euros), that is small amount for the company. However, because of the big number of waste heaps and their large sizes, coupled with the limited resources of the owners, they usually do not make even the minimum required monitoring. In case of self-heating of the waste heap, the owners of these objects typically do not apply any measures to extinguish the fire centres, and only pay small penalties for environmental pollution by combustion products. Under such circumstances it is clear that the baseline scenario does not contradict valid laws and legal norms, taking into account their performance in Ukraine.

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

- On a project specific basis.
- 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;
- Taking into account relevant national and/or sectoral policies and circumstances, local fuel availability, power sector expansion plans, and the economic situation in the coal sector. The above analysis demonstrates that the baseline chosen clearly represents the most probable future scenario taking into account the circumstances of the situation of Donbas coal sector for today;
- 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 the emission reductions will be earned only when project activity generate coal from the waste heaps, so no emission reductions can be earned due to any changes outside of project activity.
- Taking into account the uncertainties and using conservative assumptions. A number of steps have been taken in order to account for uncertainties and safeguard conservativeness:

    a) If possible, the same approaches are used to calculate baseline and project emissions when possible, that are in the National Inventory Reports (NIRs) of Ukraine. NIRs use country specific approaches and country specific emission factors that are in line with default IPCC values;

    b) Default values were used to the extent possible in order to reduce uncertainty and provide conservative data for emission calculations.

<u>Baseline Emissions</u>

In order to calculate baseline emissions following assumptions were made:

[16] Article 41 of the Code of Ukraine on Administrative Violations – http://zakon1.rada.gov.ua/cgi-bin/laws/main.cgi?page=2&nreg=80731-10
[17] http://podatki.org.ua/809
[18] http://podatki.org.ua/415
[19] http://jurisconsult.net.ua/spravochniki/382-rozmir-minimalnoyi-zarobitnoyi-plati-z.html
[20] http://minfin.com.ua/buh/minimum/

1) The project will produce ROM coal for energy and coke production that will displace the same amount of the same type of coal in the baseline scenario;
2) The coal that is displaced in the baseline scenario and the coal that is generated in the project activity are used for the same type of purpose and is stationary combusted;
3) The coal that is displaced in the baseline scenario is produced by the underground mines of the region and as such causes fugitive emissions of methane;
4) For mining coal that is substituted in the baseline scenario, a significant amount of electricity from the energy grid of Ukraine is consumed which leads to GHG emissions.
5) Waste heaps of the region are vulnerable to spontaneous self-heating and burning and at some point in time will burn;
6) The waste heaps that will be dismantled during the project realization are categorized as being at risk of ignition. In other words, if they are not utilized, they will self-heat under normal circumstances.
7) The processed rock is not vulnerable to self-heating and spontaneous ignition after the coal has been removed during the processing;
8) The correction factor is applied in order to address the uncertainty of the waste heaps burning process. This factor is defined on the basis of the survey of all the waste heaps in the area that provides a ratio of waste heaps that are or have been burning at any point in time to all existing waste heaps;
9) The total amount of coal processed by the project will be burned in the heaps over the same period.

Baseline emissions come from two major sources:

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

The table below provides values for constant parameters used to determine the baseline emissions.

Table 6. List of constants used in the calculations of baseline emissions

Data / Parameter	*Data unit*	*Description*	*Data Source*	*Value*
p_{WHB}	ratio	Correction factor that takes into account the uncertainty of the waste heap burning process	Report on the fire risk of Donetsk Region's waste heaps, Scientific Research Institute "Respirator", Donetsk, 2012	0.83
$NCV_{Coal,y}$	TJ/kt	Net calorific value of coal in 2008	National Inventory Report of Ukraine 1990-2010 p. 456[21] (1.A.1.a – Public Electricity and Heat Production)	21.5
$NCV_{Coal,y}$	TJ/kt	Net calorific value of coal in 2009	National Inventory Report of Ukraine 1990-2010 p. 462 (1.A.1.a – Public Electricity and Heat Production)	21.8
$NCV_{Coal,y}$	TJ/kt	Net calorific value of coal in 2010 and after	National Inventory Report of Ukraine 1990-2010 p. 468 (1.A.1.a – Public Electricity and Heat Production)	21.6
$OXID_{Coal,y}$	ratio	Carbon oxidation factor of coal in 2008	National Inventory Report of Ukraine 1990-2010 p. 459 (1.A.1.a – Public Electricity and Heat Production)	0.963
$OXID_{Coal,y}$	ratio	Carbon oxidation factor of coal in 2009	National Inventory Report of Ukraine 1990-2010 p. 465 (1.A.1.a – Public Electricity and Heat Production)	0.963
$OXID_{Coal,y}$	ratio	Carbon oxidation factor of coal in 2010 and after	National Inventory Report of Ukraine 1990-2010 p. 471 (1.A.1.a – Public Electricity and Heat Production)	0.962
$k^{C}_{Coal,y}$	t C/TJ	Carbon content of coal in 2008	National Inventory Report of Ukraine 1990-2010 p. 458 (1.A.1.a – Public Electricity and Heat Production)	25.95
$k^{C}_{Coal,y}$	t C/TJ	Carbon content of coal in 2009	National Inventory Report of Ukraine 1990-2010 p. 464 (1.A.1.a – Public Electricity and Heat Production)	25.97
$k^{C}_{Coal,y}$	t C/TJ	Carbon content of coal in 2010 and after	National Inventory Report of Ukraine 1990-2010 p. 470 (1.A.1.a – Public Electricity and	25.99

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

			Heat Production)	
$A_{coal,y}$	%	Average ash content of thermal coal extracted in Donetsk region, Ukraine	Guide of quality, volume of coal production and enrichment products in 2008-2010, Ministry of Coal Industry of Ukraine, State Committee of Ukraine (see Annex 4) Indicators for thermal coal.	2008 – 38.80 2009 – 39.50 2010 – 38.70 2011 – 38.70 2012 – 38.70
$W_{coal,y}$	%	Average water content of thermal coal extracted in Donetsk region, Ukraine	Guide of quality, volume of coal production and enrichment products in 2008-2010, Ministry of Coal Industry of Ukraine, State Committee of Ukraine (see Annex 4) Indicators for thermal coal.	2008 – 6.90 2009 – 6.60 2010 – 6.60 2011 – 6.60 2012 – 6.60

Baseline emissions[22] are calculated as follows:

$$BE_y = BE_{WHB,y} \quad \text{(Equation 1)}$$

where:

BE_y, - Emissions in the baseline scenario in period y, tonnes of CO_2 equivalent,

$BE_{WHB,y}$ - Emissions in the baseline scenario due to burning of the waste heaps in period y, tonnes of CO_2 equivalent.

Emissions in the baseline scenario due to burning of the waste heaps, in their turn, are calculated as follows:

$$BE_{WHB} = \frac{FC_{BE,Coal,y}}{1000} \cdot p_{WHB} \cdot NCV_{Coal} \cdot OXID_{Coal} \cdot k^{C}_{Coal} \cdot 44/12, \quad \text{(Equation 2)}$$

where:

$FC_{BE,Coal,y}$ - Amount of coal that would have been mined in the baseline scenario and combusted for energy production, in period y, t;

ρ_{WHB} - Correction factor that takes into account the uncertainty of the waste heap burning process, ratio;

$NCV_{Coal,y}$ - Net calorific value of coal in period y, TJ/kt;

$OXID_{Coal,y}$ - Carbon oxidation factor for coal in period y, ratio;

$k^{C}_{Coal,y}$ - Carbon content of coal in period y, tC/TJ;

[22] Calculation results are presented in metric tons of carbon dioxide equivalent (tCO_2e), 1 metric ton of carbon dioxide equivalent is equal to 1 metric ton of carbon dioxide (CO_2), i.e. 1 tCO_2e = 1 tCO_2.

$44/12$ - ration between molecular mass of CO_2 and C. Reflect oxidation of C to CO_2.
1/1000 - physical transformation [t] in [kt] for calculation purposes.

In order to correctly calculate the amount of thermal coal produced in mines and substituted by the coal, extracted during waste heap dismantling, it is necessary to recalculate, taking into account different indicators ash and water content of thermal coal and faction received by waste heap dismantling. If to extract moisture and substances from the mass of carbonaceous rock that are not consumed during combustion, and to turn into ash, we will get conditionally ideal coal with no water and ash content. Therefore, to obtain coal with averaged characteristics over Ukraine it is necessary to add averaged water and ash content to this ideal coal. In addition to moisture and ash coal (carbonaceous rock) also has sulphur, but its amount does not exceed few percent[23], its content in carbonaceous rock of waste heap always less, then in mined coal therefore for calculation of amount of coal that has been mined, that is substituted by the coal from the waste heap, this indicator can be neglected. Amount of coal that would have been mined in the baseline scenario and combusted for energy production is calculated as follows:

$$FC_{BE,coal,y} = FR_{coal,y} \cdot \frac{\left(1 - \frac{A_{sort,y}}{100} - \frac{W_{sort,y}}{100}\right)}{\left(1 - \frac{A_{coal,y}}{100} - \frac{W_{coal,y}}{100}\right)} \qquad \text{(Equation 3)}$$

where:

$FR_{coal,y}$ - Amount of beneficiated sorted fraction extracted from the waste heaps as a result of the project implementation in period y, t;
$A_{sort,y}$ - Average ash content of beneficiated sorted fraction extracted from waste heaps as a result of the project implementation in period y,%;
$W_{sort,y}$ - Average water content of beneficiated sorted fraction extracted from waste heaps as a result of the project implementation in period y,%;
$A_{coal,y}$ - Average ash content of thermal coal extracted in Donetsk region of Ukraine in period y, %;
$W_{coal,y}$ - Average water content of thermal coal extracted in Donetsk region of Ukraine in period y, %;
1/100 - conversion factor from percent to fraction, ratio.

Key information and data used to establish the baseline are provided below in tabular form:

Table 7. Amount of coal that has been mined in the baseline scenario

Data/Parameter	$FC_{BE,Coal,y}$
Data unit	t
Description	Amount of coal that would have been mined in the baseline scenario and combusted for energy production, in period *y*, t.
Time of determination/monitoring	Monthly
Source of data (to be) used	Project owner records
Value of data applied (for ex ante calculations/determinations)	As provided by the project owner
Justification of the choice of	Calculated according to the formula (3), Section B.1.

[23] http://masters.donntu.edu.ua/2009/feht/semkovskiy/library/article9.htm

data or description of measurement methods and procedures (to be) applied	
QA/QC procedures (to be) applied	According to the project owner policy.
Any comment	No

Table 8. Amount of sorted fraction, which is extracted from the waste heaps because of the project

Data/Parameter	$FR_{Coal,y}$
Data unit	t
Description	Amount of beneficiated sorted fraction extracted from the waste heaps as a result of the project implementation in period *y*, t.
Time of determination/monitoring	Monthly
Source of data (to be) used	Data of the company. Scales
Value of data applied (for ex ante calculations/determinations)	As provided by the project owner
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Measured for the commercial purposes on site
QA/QC procedures (to be) applied	According to national standards
Any comment	No

Table 9. The average ash content of sorted fractions, which are extracted from waste heap

Data/Parameter	$A_{sort,y}$
Data unit	%
Description	Average ash content of beneficiated sorted fraction extracted from waste heaps as a result of the project implementation in period *y*
Time of determination/monitoring	Annual monitoring
Source of data (to be) used	Data of the company
Value of data applied (for ex ante calculations/determinations)	As provided by the project owner
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Laboratory studies
QA/QC procedures (to be) applied	According to national standards
Any comment	If data on the average ash content of sorted fractions and the average water content of sorted fractions, which are extracted from waste heap in period *y* are not available to the developer, or are irregular

	with a high level of uncertainty, they are taken equal to the relevant nationwide indicators.

Table 10. The average water content of sorted fractions, which are extracted from waste heap

Data/Parameter	$W_{sort,y}$
Data unit	%
Description	Average water content of beneficiated sorted fraction extracted from waste heaps as a result of the project implementation in period *y*
Time of determination/monitoring	Annual monitoring
Source of data (to be) used	Data of the company
Value of data applied (for ex ante calculations/determinations)	As provided by the project owner
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Laboratory research
QA/QC procedures (to be) applied	According to the national standards
Any comment	If data on the average ash content of sorted fractions and the average water content of sorted fractions, which are extracted from waste heap in period *y* are not available to the developer, or are irregular with a high level of uncertainty, they are taken equal to the relevant nationwide indicators.

Leakage:

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

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

- leakages related to the fugitive methane emissions during the operation of mines;
- leakages as a result of electricity consumption from energy grid during coal mining.

The baseline scenario provides coal production only by mining activities, and this leads to **the fugitive methane emissions**. To calculate these emissions it is proposed to apply standard country specific emission factor applied to the amount of coal that is extracted from the waste heaps as a result of the project activity (which is the same as the amount of coal that would have been mined in the baseline scenario). According to the project scenario, produced coal is supplied to the energy sector of the country not from mine, but due to extraction from the waste heap using advanced beneficiation technology of coal and rock mass. Therefore, coal produced by the project activity substitutes the coal, which would have been otherwise mined in the baseline scenario that would cause the fugitive methane emissions. Thus, coal extraction from the waste heap will cause methane emissions.

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

This leakage is measurable: through the same procedure as used in 2006 IPCC Guidelines[24] (See Volume 2, Chapter 4, Page 4-11) and also used in CDM approved methodology ACM009[25] Version 03.2 (Page 8). Activity data (in our case amount of coal extracted from the waste heap which is monitored directly) is multiplied by the multi-project carbon emission factor for fugitive methane emissions from coal mining (which is sourced from the relevant national study – National Inventory Report[26] of Ukraine under the Kyoto Protocol) and conversion coefficients. It is important to mention that IPCC and relevant National Inventories take into account raw amount of coal that is being mined in these calculations whereas in the PDD coal extracted from the waste heaps is high quality coal concentrate. Therefore, approach taken in the PDD is conservative as in coal mining more ROW coal should be mined causing more fugitive methane emissions to produce equivalent amount of high quality coal concentrate.

Electricity consumption and as a result greenhouse gas emissions during waste heap dismantling will be included in the calculation of the project emissions. **Carbon dioxide emissions as a result of electricity consumption,** during coal mining in the amount that equals to the project amount of coal, is leakage that can be taken into account on the basis of State Statistics Committee[27] about the specific electricity consumption during coal production in the mines of Ukraine in the relevant year. Data in this link indicates that the specific level of electricity consumption during coal mining is higher than the specific electricity consumption from grid in the project scenario.

Leakages as a result of consumption of other types of energy carriers during coal production in the mines are insignificant in comparison to the leakages as a result of electricity consumption[28], so in this respect, and for reasons of conservatism, we will take them equal to zero.

This leakage is directly attributable to the JI project activity according to the following assumption: the coal produced by the project activity from the waste heap will substitute the coal produced by underground mines of the region in the baseline scenario. This assumption is explained by the fact that commercial output (coal), connected with fewer GHG emissions during production, will come on steam coal market and will substitute commercial output in the baseline scenario that is characterized by higher GHG emissions during its production. The project activity cannot influence demand for coal on the market and supplies coal extracted from the waste heaps. In the baseline scenario demand for coal will stay the same and will be met by the traditional source – underground mines of the region. This methodological approach is very common and is applied in all renewable energy projects, related to renewable sources (substitution of grid electricity with renewable-source electricity), projects in cement sector (e.g. JI0144 Slag Usage and Switch from Wet to Semi-dry Process at Volyn-Cement, Ukraine[29]), projects in metallurgy sector (e.g. UA1000181 Implementation of Arc Furnace Steelmaking Plant "Electrostal" at Kurakhovo, Donetsk Region[30]) and others.

These leakages are significant and will be included in the calculation of the project emission reductions under the project. Procedure for ex ante estimate and quantification of this source of leakage is provided below:

Table 11. List of constants used in the calculations of leakage

[24] http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_4_Ch4_Fugitive_Emissions.pdf
[25] http://cdm.unfccc.int/UserManagement/FileStorage/K4P3YG4TNQ5ECFNA8MBK2QSMR6HTEM
[26] http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/5888.php
[27] http://www.ukrstat.gov.ua/
[28] *THE EFFECTIVE METHOD OF ELECTRICITY CONSUMPTION CONTROL AT COAL MINES Gryaduschy B.A., Doctor of Technical Sciences, DonUGI, Lisovoy G.N., Myalkovsky V.I., ChehlatyN.A., Candidates scientific degree of Technical science, NIIGM named after Fedorov M. M., Donetsk, Ukraine* www.mishor. esco.co. ua/2005/Thesis/10. doc
[29] http://ji.unfccc.int/JI_Projects/DB/P1QYRYMBQCEQOT0HOQM60MBQ0HXNYU/Determination/Bureau%20Veritas%20Certification1266348915.6/viewDeterminationReport.html
[30] http://ji.unfccc.int/JIITLProject/DB/4THB9WT0PK6F721UQA5H6PTHZEXT4C/details

Data / Parameter	*Data unit*	*Description*	*Data Source*	*Value*
GWPCH4	$tCO_2e/ t CH_4$	Global warming potential of methane	IPCC Second Assessment Report[31]	21
ρ_{CH4}	t/m^3	Methane density	2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2: Energy, Chapter 4: Fugitive Emissions, Page 4.12. According to the standard conditions (temperature 20˚C; pressure 101 325 Pa). Measurement units have been converted from $Gg·m^{-3}$ to t/m^3.	0.00067
$EF_{CH_4,CM}$	m^3/t	Fugitive methane emissions factor during coal mining	National Inventory Report of Ukraine 1990-2010, p. 90	25.67
$N^e{}_{coal,y}$	MWh/t	Average consumption of electricity per tonne of extracted coal in Ukraine in 2008	State Statistics Service of Ukraine. Fuel and energy resources of Ukraine, Statistical Yearbook, Kyiv 2011, p. 438[32] See also Annex 5	0.0878
$N^e{}_{coal,y}$	MWh/t	Average consumption of electricity per tonne of extracted coal in Ukraine in 2009	State Statistics Service of Ukraine. Fuel and energy resources of Ukraine, Statistical Yearbook, Kyiv 2011, p. 300[33] See also Annex 5	0.0905
$N^e{}_{coal,y}$	MWh/t	Average consumption of electricity per tonne of extracted coal in Ukraine in 2010	State Statistics Service of Ukraine. Fuel and energy resources of Ukraine, Statistical Yearbook, Kyiv 2011, p. 300[34] See also Annex 5	0.0926
$N^e{}_{coal,y}$	MWh/t	Average consumption of electricity per tonne of extracted coal in Ukraine in 2011 and after	State Statistics Service of Ukraine. Bulletin "The results of the fuel, heat and electric power consumption" for 2011, Kyiv 2011, Letter 19[35] See also Annex 5	0.0842

[31] "*IPCC Second Assessment: Climate Change 1995. A Report of the Intergovernmental Panel on Climate Change*".*Bolin, B.* et al. (1995). IPCC website. http://www.ipcc.ch/pdf/climate-changes-1995/ipcc-2nd-assessment/2nd-assessment-en.pdf.
[32] http://www.ukrstat.gov.ua/druk/katalog/m-e_res/Pal_en_res.zip
[33] http://www.ukrstat.gov.ua/druk/katalog/kat_u/2012/sz_per_2010.zip
[34] http://www.ukrstat.gov.ua/druk/katalog/kat_u/2012/sz_per_2010.zip

$EF_{grid,y}$	t CO_2/MWh	Specific indirect carbon dioxide emissions during the consumption of electric energy by the 2nd class electricity consumers according to Procedure for determining consumers' classes, approved by Resolution of the National Electricity Regulatory Commission of Ukraine dated 13.08.1998 # 1052	In 2008 – National Environmental Investment Agency Order No.62 dated 15.04.2011 p.36	1.219
			In 2009 – National Environmental Investment Agency Order No.63 dated 15.04.2011 p.37	1.237
			In 2010 – National Environmental Investment Agency Order No.43 dated 28.03.2011 p.38	1.225
			In 2011 and after – National Environmental Investment Agency Order No.75 dated 12.05.2011 p.39	1.227

Leakages in period *y* are calculated as follows:

$$LE_y = LE_{CH_4,y} + LE_{EL,y}$$ (Equation 4)

where:

LE_y - Leakages resulting from the project implementation in period *y*, tonnes of CO_2 equivalent;

$LE_{CH_4,y}$ - Leakages due to the fugitive methane emissions during the operation of mines in period *y,* tonnes of CO_2 equivalent;

$LE_{EL,y}$ - Leakages as a result of electricity consumption from energy grid during coal mining in period *y*, tonnes of CO_2 equivalent.

Leakages due to the fugitive methane emissions during the operation of mines in period *y* are calculated as follows:

$$LE_{CH_4,y} = -FC_{BE,Coal,y} \cdot EF_{CH_4,CM} \cdot \rho_{CH_4} \cdot GWP_{CH_4}$$ (Equation 5)

where:

$FC_{BE,Coal,y}$ - Amount of coal that would have been mined in the baseline scenario and combusted for energy production, in period *y*, t;

$EF_{CH_4,CM}$ - Fugitive methane emissions factor during coal mining, m^3/t;

ρ_{CH4} - Methane density, t/ m^3;

GWP_{CH4} - Global Warming Potential of Methane, tCO_2e/tCH_4.

[35] http://www.ukrstat.gov.ua/druk/katalog/kat_u/2012/05_2012/bl_rvp_2011.zip
[36] http://www.neia.gov.ua/nature/doccatalog/document?id=127171
[37] http://www.neia.gov.ua/nature/doccatalog/document?id=127172
[38] http://www.neia.gov.ua/nature/doccatalog/document?id=126006
[39] http://www.neia.gov.ua/nature/doccatalog/document?id=127498

Amount of coal that would have been mined in the baseline scenario and combusted for energy production is calculated as follows:

$$FC_{BE,coal,y} = FR_{coal,y} \cdot \frac{\left(1 - \frac{A_{sort,y}}{100} - \frac{W_{sort,y}}{100}\right)}{\left(1 - \frac{A_{coal,y}}{100} - \frac{W_{coal,y}}{100}\right)} \qquad \text{(Equation 6)}$$

where:

$FR_{coal,y}$ - Amount of beneficiated sorted fraction extracted from the waste heaps as a result of the project implementation in period *y*, t;

$A_{sort,y}$ - Average ash content of beneficiated sorted fraction extracted from waste heaps as a result of the project implementation in period y,%;

$W_{sort,y}$ - Average water content of beneficiated sorted fraction extracted from waste heaps as a result of the project implementation in period y,%.

$A_{coal,y}$ - Average ash content of thermal coal extracted in Donetsk region of Ukraine in period y, %;

$W_{coal,y}$ - Average water content of thermal coal extracted in Donetsk region of Ukraine in period y, %.

1/100 - conversion factor from percent to fraction, ratio.

Leakages as a result of electricity consumption from energy grid during coal mining in period *y* are calculated as follows:

$$LE_{EL,y} = -FC_{BE,Coal,y} \cdot N^{e}_{coal,y} \cdot EF_{grid,y} \qquad \text{(Equation 7)}$$

where:

$FC_{BE,coal,y}$ - Amount of coal that would have been mined in the baseline scenario and combusted for energy production, in period *y*, t;

$N^{E}_{coal,y}$ - Average consumption of electricity per tonne of extracted coal in Ukraine in period *y*, MWh/t;

$EF_{grid,y}$ - Specific indirect carbon dioxide emissions during the consumption of electric energy by the 2nd class electricity consumers according to Procedure for determining consumers' classes, approved by Resolution of the National Electricity Regulatory Commission of Ukraine dated 13.08.1998 # 1052 in period y, t CO_2/MWh.

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:

The following step-wise approach is used to demonstrate that the project provides reductions in emissions by sources that are additional to any that would otherwise occur:

Step 1. Indication and description of the approach applied

According to Paragraph 44 (b) of the Annex 1 of the Guidance "Guidance on Criteria for Baseline Setting and Monitoring" version 03, additionality can be demonstrated by provision of traceable and transparent information showing that the same approach for additionality demonstration has already been taken in cases for which determination is deemed final and which can be regarded as comparable, using the criteria outlined for baseline determination in paragraph 12 of the Guidance. It was decided to refer to the positively determined project "Waste Heap Dismantling in Lugansk Region of Ukraine with the Aim of Reduction Greenhouse Gases Emissions to Atmosphere" (ITL Projects ID: UA1000327). This, project already implemented or the one that will be implemented with comparable conditions (the same measures to reduce the negative impact of GHG, the same country, similar technology, similar scale), will have as a result reduction of anthropogenic emissions by sources or enhancement removals by sinks that are additional to any that would have been in the absence of the project, and also relevant to this project.

Step 2. Application of the approach chosen

The following steps are performed to demonstrate additionality of this project:

Sub step 2a: Identify comparable project where an accredited independent entity has already positively determined that it would result in a reduction of anthropogenic emissions by sources or an enhancement of net anthropogenic removals by sinks that is additional in the absence the project.

The project "Waste Heap Dismantling in Lugansk Region of Ukraine with the Aim of Reduction Greenhouse Gases Emissions to Atmosphere" is selected as the comparable JI project. Accredited independent entity has already positively determined that it would result in a reduction of anthropogenic emissions by sources or an enhancement of net anthropogenic removals by sinks that is additional to any that would otherwise occur. This determination has already been deemed final by the JISC. Appropriate documentation such as PDD and Determination Report regarding this project is available traceably and transparently on the UNFCCC JI Website: http://ji.unfccc.int/JIITLProject/DB/MWT8YE8A68MBKRG48QJ8Q4O44M7BVY/details

Sub step 2b: Demonstrate that the identified project is a comparable project (to be) implemented under comparable circumstances:

In accordance with paragraphs 44 and 12 of Guidelines on criteria for baseline setting and monitoring version 03 we will demonstrate that for both projects:

1) **Both projects propose the same measures of GHG emissions reduction into the atmosphere**: coal extraction from the mine's waste heaps, formed as a result of coal mines activities. Due to this the level of GHG emissions from self-heating of the waste heaps decreases and additional amount of coal with less negative factor of environmental pollution is obtained. In any case boundaries of both projects include the same sources of GHG emissions.
2) **Both projects have comparable geography and time of implementation.** Both projects are being implemented in Ukraine, and the difference between the starting dates of the projects is less than five years – 16.11.2006 for this project and 15.01.2006 for the comparable one.
3) Both projects have **similar scale**: Both projects are large scale JI projects. Both projects process waste heaps of comparable scale. Proposed project has annual capacity of 756 thousand tons of rock mass with two-shift work and the length of shift in 8 hours (the number of working days per year - 315). Comparable project has capacity of 100 tons of rock mass per hour[40] that corresponds the annual capacity of 504 tons under the same conditions. In other words annual capacity of the proposed project does not exceed the annual capacity of comparable project more than on 50%.

[40] http://ji.unfccc.int/UserManagement/FileStorage/XSUQ1CDRHWBPO3Y0EIG6J95M8AZ2LV Page 12

Amount of the extracted coal is limited by coal content in the waste heap and by the size of the waste heap.

4) **Both projects were implemented under the same regulatory conditions.** Regulatory and legal framework and general regulatory practice between the starting dates of the projects did not change so that these changes influenced the baseline of the projects.

Thus the criteria identified by the Guidance are satisfied and the identified project is indeed a comparable projects implemented under comparable circumstances.

Step 3: Justification why determination of the comparable project refers to this project

The project "Waste Heap Dismantling in Lugansk Region of Ukraine with the Aim of Reduction Greenhouse Gases Emissions to Atmosphere" and the proposed project are implemented within the same geographic region of Ukraine – the Donbas coal mining region. The implementation timeline is quite similar. Projects will share the same investment profile and market environment. These projects are implemented by private companies with no utilization of public funds. The investment climate will be comparable in both cases with the coal sector being an almost non-profitable sector in Ukraine [41] burdened by many problems. The market for the extracted coal will also be similar for projects as these are small private companies that will not be able to sell coal in big quantities under long-term contracts. Ukrainian coal sector is largely state-controlled. Energy and Coal Ministry of Ukraine decides production level of state mines, based on their performance. After this, state controlled mines sell their coal to the state Trading Company "Coal of Ukraine". This company also buys coal from private mines and arranges supply of coal to thermal electricity companies. Prices for coal mines differ significantly for public and private mines[42].

Both projects also share the investment climate of Ukraine which is far from being favourable. Ukraine is considered to be a high risk country for doing business and investing in. Almost no private capital is available from domestic or international capital markets for mid to long term investments, and any capital that is available has high cost. The table below represents risks of doing business in Ukraine according to various international indexes and studies.

Table 12. International ratings of Ukraine

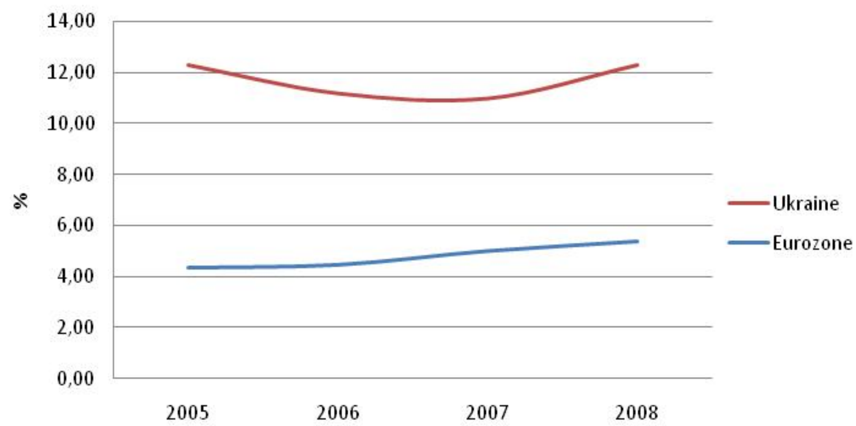
Indicators	2008	2011	Note
Corruption index of Transparency International [43]	134 position from 180	152 position from 182	Index of corruption
Rating of business practices of The World Bank (The Doing Business) [44]	139 position from 178	145 position from 183	Rating of conduct of business (ease of company opening, licensing, staff employment, registration of ownership, receipt of credit, defence of interests of investors)
The IMD World Competitiveness Yearbook[45]	54 position from 55	57 position from 59	Research of competitiveness (state of economy, efficiency of government, business efficiency and state of infrastructure)
Index of Economic Freedom	133	163	Determination of degrees of freedom of economy

[41] http://www.necu.org.ua/wp-content/plugins/wp-download_monitor/download.php?id=126
[42] http://www.ier.com.ua/files/publications/Policy_papers/German_advisory_group/2009/PP_09_2009_ukr.pdf
[43] http://cpi.transparency.org/cpi2011/in_detail/
[44] http://www.doingbusiness.org/rankings
[45] http://www.imd.org/research/publications/wcy/upload/scoreboard.pdf

of Heritage Foundation[46]	position from 157	position from 179	(business, auction, financial, monetary, investment, financial, labour freedom, freedom from Government, from a corruption, protection of ownership rights)
Global Competitiveness Index of World Economic Forum [47]	72 position from 134	82 position from 142	Competitiveness (quality of institutes, infrastructure, macroeconomic stability, education, development of financial market, technological level, innovative potential)

The data above shows that both real and perceived risks of investing in Ukraine are in place and influence the availability of capital in Ukraine both in terms of size of the investments and in terms of capital costs. Comparison of commercial lending rates in Ukraine and in the euro zone for loans for 5 years in Euros is presented in the figure below:

Figure 6: Commercial lending rates, Euros, for five years



As stated at the OECD Roundtable on Enterprise Development and Investment Climate in Ukraine, the current legal basis is not only inadequate, but to a large extent it sabotages the development of market economy in Ukraine. Voices in the western press can basically be summarized as follows: The reforms in the tax and legal systems have improved considerably with the adoption of the commercial Code, Civil Code and Customs Code on 1 January 2004 and new Tax Code on 1 January 2011 but still contain unsatisfactory elements and pose a risk for foreign investors[48]. Ukraine is considered to be heading in the right direction with significant reforms having been put into action but still has a long way to go to realize its full potential. Frequent and unpredictable changes in the legal system along with conflicting and inconsistent Civil and Commercial Codes do not allow for a transparent and stable enforced legal business environment. This is perceived as a great source of uncertainty by international companies, which make future predictions of business goals and strategy risky.

[46] http://www.heritage.org/index/ranking
[47] http://reports.weforum.org/global-competitiveness-2011-2012/
[48] Foreign Direct Investment in Ukraine – Donbas, Philip Burris, Problems of foreign economic relations development and attraction of foreign investments: regional aspect, ISSN 1991-3524, Donetsk, 2007. p. 507-510

The conclusion from the abovementioned is as follows: the investment climate of Ukraine is risky and unwelcoming, private capital is not available from domestic or international sources or available at prohibitively high cost due to real and perceived risks of doing business in Ukraine as shown by various sources. Alternatives markets, such as Russia, offer similar profile of investment opportunities with lower risk and better business environment.

Subject to the above information, we can conclude that determination of the project "Waste Heap Dismantling in Lugansk Region of Ukraine with the Aim of Reduction Greenhouse Gases Emissions to Atmosphere" is relevant for this project.

Outcome of the analysis: This section of PDD gives traceable and transparent information that has received positive determination by accredited independent entity that comparative project "Waste Heap Dismantling in Lugansk Region of Ukraine with the Aim of Reduction Greenhouse Gases Emissions to Atmosphere" (ITL Projects ID: UA1000327) is implemented under comparable circumstances (same GHG mitigation measure, same country, similar technology, similar scale) would result in a reduction of anthropogenic emissions sources or an enhancement of net anthropogenic removals by sinks that is additional to any that would otherwise occur and have provided justification on why this determination is relevant for the project at hand. Therefore, this 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 and production capacity of beneficiation complex. "RIGHT" LLC buys bulk materials - coal and rock mass from the waste help that belongs to Shakhtoupravlinnya "Donbas" and that is formed as a result of activity of the mine "Schehlivska-Hlyboka". At the industrial site of "RIGHT" LLC there is reception of coal and rock mass, and its further beneficiation in order to extract ROM coal, which substitute that amount of coal that would have to be produced by underground mines. Extracted coal will be shipped to the consumer as energy fuel for thermal power plants and coke plants. Under the project electricity consumption by beneficiation complex of raw materials is assumed and also consumption of diesel fuel by trucks that deliver coal and rock mass from the waste heap.

According to the baseline, all amount of coal is extracted in coal mines, and delivered to the energy market of Ukraine for energy generation in thermal power plants. Therefore, carbon dioxide emissions by burning coal in the baseline and project scenario are equal. In addition, mined coal leads to fugitive emissions of coal mine methane, which are dangerous for environment. Coal mine utilizes different types of energy, but electricity consumption takes the bulk of the energy balance of coal enterprises, about[49] 90%. The remaining 10% of the balance of energy consumption is not considered in order to provide conservativeness.

It should be noted that appropriate fuel at thermal power plants was burned for generating this electricity that led to GHG emissions into the atmosphere. Therefore, in accordance with the implementation of JI projects, reducing leakages outside the project activity will take place.

The table below demonstrates overview of all emission sources in the baseline and project scenarios. Project boundaries are shown in accordance with the provisions of Articles 13, 14 of JISC Guidelines.

[49] *THE EFFECTIVE METHOD OF ELECTRICITY CONSUMPTION CONTROL AT COAL MINES Gryaduschy B.A., Doctor of Technical Sciences, DonUGI, Lisovoy G.N., Myalkovsky V.I., ChehlatyN.A., Candidates scientific degree of Technical science, NIIGM named after Fedorov M. M., Donetsk, Ukraine*

Table 13. Demonstration of sources of emission

	Source	Gas	Included/Excluded	Justification/Explanation
Baseline scenario	Waste heap burning	CO_2	Included	Main emission source
	Coal consumption	CO_2	Excluded	This coal is extracted from the waste heaps. This emission source is equal to the one present in the baseline scenario and, therefore is excluded from consideration.
Project scenario	Coal consumption	CO_2	Excluded	This coal is extracted from the waste heaps. This emission source is equal to the one present in the baseline scenario and, therefore is excluded from consideration.
	Electricity use for the process of coal extraction from the waste heaps	CO_2	Included	Main emission source
	Fossil fuel (diesel) consumption for the process of coal extraction from the waste heap	CO_2	Included	Main emission source
Leakages	Leakages related to the fugitive methane emissions during the operation of mines	CH_4	Included	These emissions are attributable to baseline scenario, which provides fugitive methane emissions as a result of coal production in coal mines
	Leakages as a result of electricity consumption from the grid at coal production in mines	CO_2	Included	These emissions are attributable to baseline scenario, which provides coal production in coal mines
	Use of other types of energy carriers for mine operating	CO_2	Excluded	These leakages are not significant, but also for reasons of conservatism, they are excluded from consideration.

Baseline scenario

The baseline scenario is the continuation of the existing situation. Coal is produced by the underground mines and is used for energy generation. Waste heaps are often self-heating and burning that causes 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

According to the project scenario there is extraction of the coal of ROM class from the waste heap. Therefore, the possibility of emissions due to spontaneous self-heating and burning of the waste heaps is eliminated. Project activity anticipates combustion of auxiliary diesel fuel to supply rock from the waste heap to the complex for coal and rock mass beneficiation where, moreover, electricity is used. Additional coal provided by the project reduces the need for coal to be mined from underground Emission sources in the project scenario:

- project emissions as a result of consumption of diesel fuel by project implementation in period *y*;
- project emissions as a result of electricity consumption from the grid during the project implementation in period *y*.

Carbon dioxide emissions that occur during the combustion of energy coal are calculated as stationary combustion emissions from coal in the equivalent of the amount of coal that is extracted from the waste heaps in the project scenario. This emission source is also present in the baseline scenario and the emissions are assumed to be equal in both project and baseline scenario. Therefore, this emission source is not included into consideration both in the project and the baseline scenario.

Leakage
Emissions sources are:

- Fugitive leakages of methane because of coal production in mines;
- Leakages of carbon dioxide because of electricity consumption and other forms of energy carriers during.

For demonstration of the boundaries of the project and emission sources in the baseline and project scenarios there are following figures:

Figure 7: Project boundaries in the baseline scenario

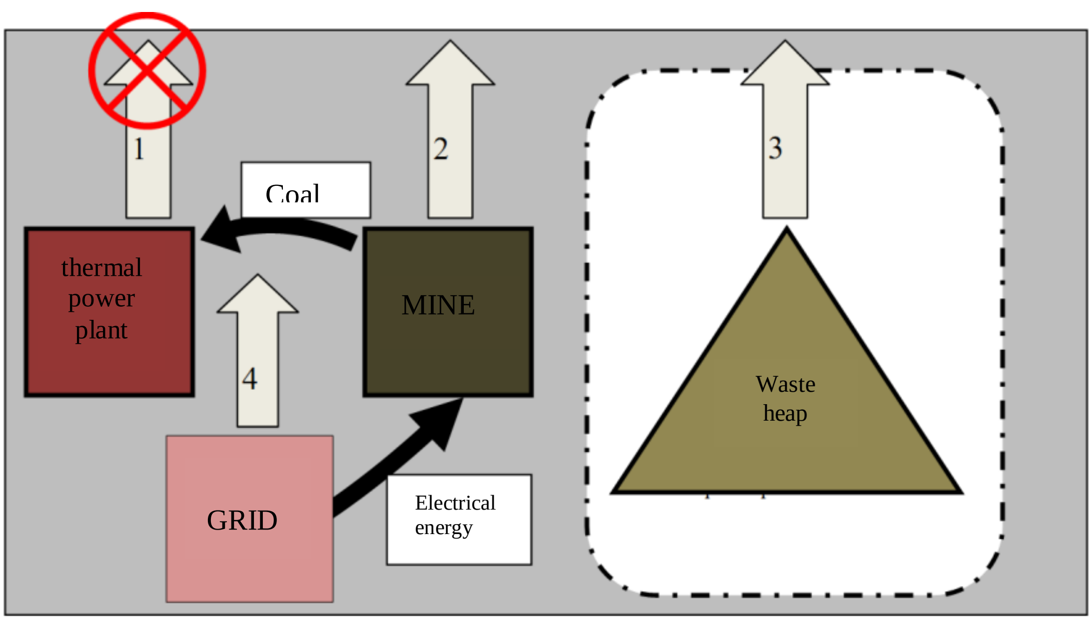


Figure 8: Project boundaries in the project scenario

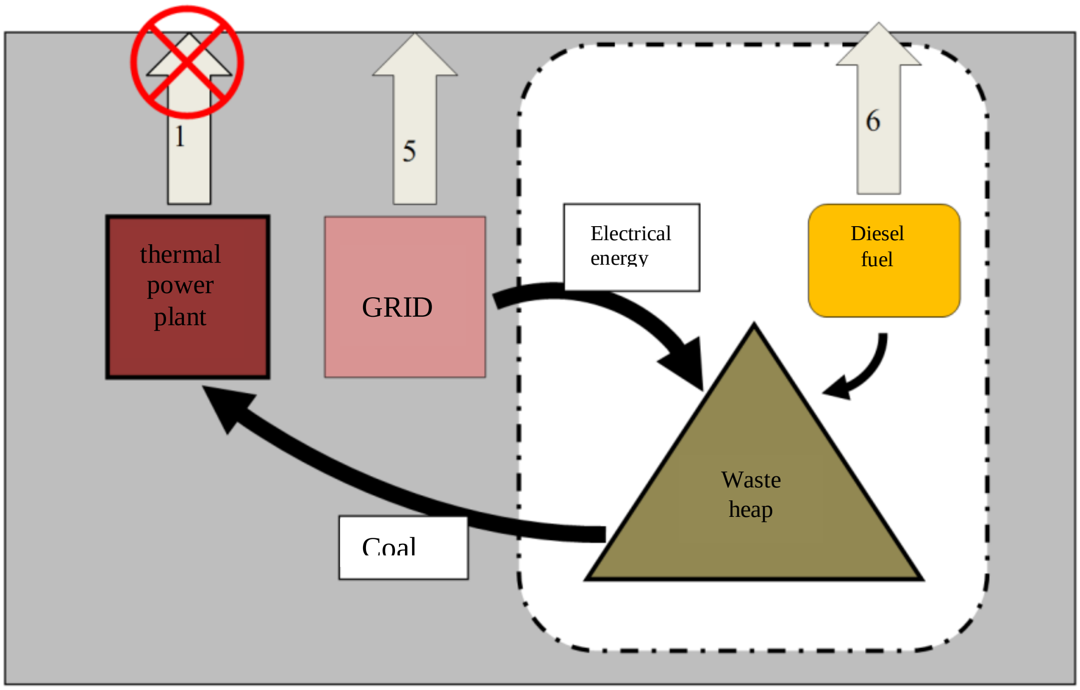
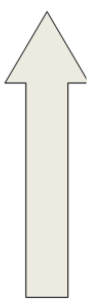


Figure 9: Symbols in schematic diagram of the project boundary

Sources of greenhouse gas emissions on the schemes



1. Emissions of carbon dioxide by coal burning
2. Leakages of methane during mining
3. Emissions of carbon dioxide during waste heap burning
4. Leakages of carbon dioxide during electricity consumption from the grid during operation of mine
5. Emissions of carbon dioxide in electricity consumption from the grid during dismantling
6. Emissions of carbon dioxide by diesel fuel burning during operation of equipment at the waste heap

- Emissions by coal burning excluded from consideration

B.4. Further baseline information, including the date of baseline setting and the names of the persons/entities setting the baseline:

Date of baseline setting: 17/07/2012

Name of person/entity setting the baseline:

Studies of the baseline level were held by the company PE "MC "Metropoliya" that is not project participant.

Contact details:

Company	Private Enterprise "Management Company "Metropoliya" (PE "MC "Metropoliya")
Company name:	03187, Kyiv, Academician Glushkov Prospect, 55
Company address:	
Contact person:	Dovgal Oleksandr Anovych
Name:	Deputy Director
Title:	+380 44 581 55 60
Phone:	+380 44 581 55 61
Fax:	daa@metropoliya.com.ua

SECTION C. Duration of the project/crediting period

C.1. Starting date of the project:

Starting date of the project is 16th of November 2006 – coordination of the location of facility for the waste heaps beneficiation. This date was fixed in the act of selection and examination of lands from 16.11.2006. .

C.2. Expected operational lifetime of the project:

The lifetime of the project is estimated to last until the end of 2020. Thus the operational lifetime of the project will be 13 years or 156 months.

C.3. Length of the crediting period:

Start of the crediting period: 01.01.2008.
End of the crediting period: 31.12.2012.
Length of the crediting period: 5 years or 60 months.

Starting date of generating emission reductions: 01.01.2008 – beginning of beneficiation plant operation in operating mode.

Emission reductions generated after the crediting period may be used in accordance with an appropriate mechanism under the UNFCCC. The crediting period can extend subject to the approval by the Host Party. Taking this possible extension into account the length of the crediting period starting on the 01.01.2008 and ending on the 31.12.2020 will be 13 years or 156 months.

SECTION D. Monitoring plan

D.1. Description of monitoring plan chosen:

Description and explanation of the monitoring plan chosen a step-wise approach is used:

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

Option *a* provided by the "Guidelines for users of the Joint Implementation project design document form" version 04[50], JI specific approach is used for this project and therefore will be used for establishment of a monitoring plan.

The monitoring plan will provide for:

1. *Collection and archiving of all relevant data necessary for estimating or measuring anthropogenic emissions by sources of GHGs occurring within the project boundary during the crediting period*:

   For monitoring data under the project clear and reliable management structure will be identified to establish the division of responsibilities, and also relevant services at the enterprise are defined. Created services of the plant will collect relevant data in the form of technical reports and other statistical documents. All monitored data will be stored both electronically and in hard copy. The data will be archived and kept at least 2 years after last transfer of emission reduction units.

2. *Collection and archiving of all relevant data necessary for determining the baseline of anthropogenic emissions by sources of GHGs within the project boundary during the crediting period*:

   For collecting this information, technical reports, acts of product weighing, control measurements and calculations will be used. Monitoring data will be stored both electronically and in hard copy, and also will be archived and kept at least 2 years after last transfer of emission reduction units.

3. *Identification of all potential sources of, and the collection and archiving of data on increased anthropogenic emissions by sources of GHGs outside the project boundary that are significant and reasonably attributable to the project during the crediting period:*

   No significant leakages take place during the project activities. The only source of greenhouse gas emissions outside the project boundaries and attributable to the project are power stations that produce electricity by burning fuel. This source is considered in the monitoring of greenhouse gas emissions by use of applying coefficient of GHG emissions due to consumption of electricity from the Ukrainian power grid, calculated for

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

each year by the Ukrainian DFP, namely, State Environmental Investment Agency (SEIA) of Ukraine (previous name - National Environmental Investment Agency of Ukraine, or NEIA).

4. *Quality assurance and control procedures for the monitoring process:*

The quality of collected data will be secured by conducting regular calibrations of applied meters and sensors. Calibration interval will be chosen as per passport or technical manual data. The regional representative of State Metrological System of Ukraine accompanied by energy department of the plant will be responsible for calibration procedures. If any malfunction is done, the meter will be displaced with similar one in accordance with industry standards of Ukraine. It will be set control over the technical condition of the measuring equipment from the side of staff of this company (The troubleshooting will be made by maintenance mechanics or on-duty electrician/operator).

5. *Procedures for the periodic calculation of the reductions of anthropogenic emissions by sources by the proposed JI project, and for leakage effects, if any*:

During the project implementation leakages outside the project boundaries are not expected. Under the baseline scenario during coal mining there are fugitive methane emissions. For taking into account this source of emissions special factor is used from National Inventory Report. Besides, implementation of the proposed project will reduce electricity consumption in comparison with the situation that occurs during coal mining. Calculation of these emissions will be determined by means of using coefficient of carbon dioxide emissions during power consumption from Ukrainian grid, calculated for each year by the Ukrainian DFP, namely, State Environmental Investment Agency (SEIA) of Ukraine (previous name - National Environmental Investment Agency of Ukraine, or NEIA), as well as by statistical data, submitted annually by the State Statistics Committee regarding specific electricity consumption at coal mines during coal production. Other sources of emissions during mining production are not considered for conservative calculations.

Step 2. Application of the approach chosen

Key factors that affect emissions level under the project and under the baseline scenario were taken into account and described in detail in section B.1. The project activity will include monitoring of greenhouse gas emissions in the project and baseline scenarios. Detailed information on emission sources of the project and baseline is presented hereunder. The data relating to the monitoring of GHG emission reductions will be archived and kept at least 2 years after last transfer of emission reduction units

Baseline scenario

The basic scenario is the continuation of the existing situation. Coal is extracted by mining and used for energy production. Waste heaps are often prone to burning and self-heating, which results in carbon dioxide emissions into the atmosphere. The sources of emissions in the baseline scenario that are included in the project boundaries are:

- Carbon dioxide emissions because of burning coal in the waste heaps.

Leakages

Sources of leakages in the baseline scenario are:

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

Project scenario

Due to the project activities (waste heap dismantling and extraction of combustible materials from it), the possibility of emissions as a result of self-heating is excluded. According to the project activity combustion of additional diesel fuel is provided for the transportation of coal and rock mass from the waste heap to the beneficiation complex. Also electricity consumption by the project equipment is provided. Extracted coal from the waste heap substitutes the same amount of coal that would have been mined.

Emission sources in the project scenario are:

- Carbon dioxide emissions related to the consumption of diesel fuel by vehicles;
- Carbon dioxide emissions related to the energy consumption by the project facilities.

Carbon dioxide emissions as a result of combustion of thermal coal are calculated as emissions from stationary burnt coal in the amount equivalent to amount of coal extracted from heaps in the project scenario. This emission source can also be found in the project scenario and it is assumed that emissions are equivalent in the project and in the baseline scenarios. Therefore, this emission source is not considered in both cases.

Emission reduction as a result of the project implementation will be ensured by three main sources:

- Removing sources of GHG emissions as a result of burning of waste heaps by extracting coal from the heap;
- Negative leakages from reduction of fugitive methane emissions related to substitution, under the project, of coal, produced by mining;
- Leakages related to the electricity consumption from the grid by coal mines.

During any period of monitoring data on the following parameters should be collected and registered:

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

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

2. **Amount of diesel fuel, consumed in the relevant period as a result of implementation of the project activity**

   For the metering of this parameter the commercial data of the company is used. Receipts and other accounting data are used in order to confirm the amount of fuel consumed. All fuel consumption is taken into account and is attributed to the project activity. At the industrial site there is consumption of diesel fuel only by the project transport, but if other equipment is used, fuel consumption by this equipment is also considered. If the data in the commercial documents mentioned are provided in litres rather than in tonnes the data in litres are converted into tonnes using the density of 0.85 kg/l [51]. Regular cross-checks with the suppliers are carried out. The monthly and annual reports are based on these data.

3. **Amount of final product, extracted from the waste heap and received after beneficiation as a result of the project activity**

   For the metering of this parameter the commercial data of the company is used. For confirmation of amount fraction (0-50mm) acceptance certificates, acts of weighing products and other documents from customers are used. To calculate the GHG emissions reductions only those products that were shipped to the buyer, is taken into account and refers to the project activity. Weighing is done at the industrial site of mine "Schehlivska-Hlyboka" close to the beneficiation complex using special railway weights. For transparency and accuracy of accounting of this parameter regular cross-checks with the customers are performed. On the basis of daily acts of acceptance of coal products, monthly and annual technical reports are prepared.

4. **Ash and water content of the beneficiated sorted fraction of coal extracted from the waste heap as a result of the project activity**

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

Data and parameters that were not monitored during the whole crediting period, are determined only once (and remain constant during the whole crediting period) and are available at the stage of determination of the PDD, are listed in the table below:

[51] GOST 3868-99 Diesel fuel. Specifications. The density of 0.85 kg/l is taken as average value between the two types of diesel fuel: summer and winter (data from Table 1). Values are converted from kg/m^3 into kg/l.

Table 14. List of constants used in calculations of emissions

Data / Parameter	Data unit	Description	Data Source	Value
GWP_{CH4}	tCO2e/tCH4	Global Warming Potential of Methane	IPCC Second Assessment Report[52]	21
ρ_{CH4}	t/m3	Methane density	2006 IPCC "IPCC Guidelines for National Greenhouse Gas Inventories", Volume 2: Energy. Section 4: Fugitive emissions, p.4.12. According to standard conditions (temperature 20°C; pressure 101325 Pa)[53]. Measurement units have been converted from $Gg \cdot m^{-3}$ to t/m^3.	0.00067
p_{WHB}	ratio	Correction factor that takes into account the uncertainty of the waste heap burning process	Report on the fire risk of Donetsk Region's waste heaps, Scientific Research Institute "Respirator", Donetsk, 2012	0.83
$EF_{CH_4,CM}$	m^3/t	Fugitive methane emissions factor during coal mining	National Inventory Report of Ukraine 1990-2009 p. 90	25.67
$NCV_{Coal,y}$	GJ/t	Net Calorific Value of coal in 2008	National Inventory Report of Ukraine 1990-2010 p. 456[54] (1.A.1.a – Public Electricity and Heat Production)	21.5
$NCV_{Coal,y}$	TJ/kt	Net Calorific Value of coal in 2009	National Inventory Report of Ukraine 1990-2010 p. 462 (1.A.1.a – Public Electricity and Heat Production)	21.8

[52] http://www.ipcc.ch/ipccreports/sar/wg_I/ipcc_sar_wg_I_full_report.pdf Page 22.
[53] http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_4_Ch4_Fugitive_Emissions.pdf
[54] http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/5888.php

$NCV_{Coal,y}$	TJ/kt	Net Calorific Value of coal in 2010 and after	National Inventory Report of Ukraine 1990-2010 p. 468 (1.A.1.a – Public Electricity and Heat Production)	21.6
$OXID_{Coal,y}$	ratio	Carbon oxidation factor of coal in 2008	National Inventory Report of Ukraine 1990-2010 p. 459 (1.A.1.a – Public Electricity and Heat Production)	0.963
$OXID_{Coal,y}$	ratio	Carbon oxidation factor of coal in 2009	National Inventory Report of Ukraine 1990-2010 p. 465 (1.A.1.a – Public Electricity and Heat Production)	0.963
$OXID_{Coal,y}$	ratio	Carbon oxidation factor of coal in 2010 and after	National Inventory Report of Ukraine 1990-2010 p. 471 (1.A.1.a – Public Electricity and Heat Production)	0.962
$k^{C}_{Coal,y}$	t C/TJ	Carbon content of coal in 2008	National Inventory Report of Ukraine 1990-2010 p. 458 (1.A.1.a – Public Electricity and Heat Production)	25.95
$k^{C}_{Coal,y}$	t C/TJ	Carbon content of coal in 2009	National Inventory Report of Ukraine 1990-2010 p.464 (1.A.1.a – Public Electricity and Heat Production)	25.97
$k^{C}_{Coal,y}$	t C/TJ	Carbon content of coal in 2010 and after	National Inventory Report of Ukraine 1990-2010 p. 470 (1.A.1.a – Public Electricity and Heat Production)	25.99
$A_{coal,y}$	%	Average ash content of thermal coal extracted in Donetsk region of Ukraine	Guide of quality, volume of coal production and enrichment products in 2008-2010, Ministry of Coal Industry of Ukraine, State Committee of Ukraine (See Annex 4). Indicators for thermal coal.	2008 – 38.80 2009 – 39.50 2010 – 38.70 2011 – 38.70 2012 – 38.70
$W_{coal,y}$	%	Average water content of thermal coal extracted in Donetsk region of Ukraine	Guide of quality, volume of coal production and enrichment products in 2008-2010, Ministry of Coal Industry of Ukraine, State Committee of Ukraine (See Annex 4). Indicators for thermal coal.	2008 – 6.90 2009 – 6.60 2010 – 6.60 2011 – 6.60 2012 – 6.60

$N^{e}_{coal,y}$	MWh/t	Average electricity consumption per ton of coal, produced in Ukraine in 2008	State Statistics Service of Ukraine. Fuel and energy resources of Ukraine, Statistical Yearbook, Kyiv 2009, p. 438.[55] See also Annex 5	0.0878
$N^{e}_{coal,y}$	MWh/t	Average electricity consumption per ton of coal, produced in Ukraine in 2009	State Statistics Service of Ukraine. Fuel and energy resources of Ukraine, Statistical Yearbook, Kyiv 2009, p. 300.[56] See also Annex 5	0.0905
$N^{e}_{coal,y}$	MWh/t	Average electricity consumption per ton of coal, produced in Ukraine in 2010	State Statistics Service of Ukraine. Fuel and energy resources of Ukraine, Statistical Yearbook, Kyiv 2009, p. 300.[57] See also Annex 5	0.0926
$N^{e}_{coal,y}$	MWh/t	Average electricity consumption per ton of coal, produced in Ukraine in 2011 and after	State Statistics Service of Ukraine. Bulletin "The results of the fuel, heat and electric power consumption" for 2011, Kyiv 2011, Letter 19.[58] See also Annex 5	0.0842
$NCV_{diesel,y}$	TJ/kt	Net Calorific Value of diesel fuel in 2008	National Inventory Report of Ukraine 1990-2010 p. 473[59] (values for mobile combustion overview)	42.2
$NCV_{diesel,y}$	TJ/kt	Net Calorific Value of diesel fuel in 2009	National Inventory Report of Ukraine 1990-2010 p. 476 (values for mobile combustion overview)	42.2

55 http://www.ukrstat.gov.ua/druk/katalog/m-e_res/Pal_en_res.zip
56 http://www.ukrstat.gov.ua/druk/katalog/kat_u/2012/sz_per_2010.zip
57 http://www.ukrstat.gov.ua/druk/katalog/kat_u/2012/sz_per_2010.zip
58 http://www.ukrstat.gov.ua/druk/katalog/kat_u/2012/05_2012/bl_rvp_2011.zip
59 http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/5888.php

$NCV_{diesel,y}$	TJ/kt	Net Calorific Value of diesel fuel in 2010 and after	National Inventory Report of Ukraine 1990-2010 p. 479 (values for mobile combustion overview)	42.2
$OXID_{diesel,y}$	ratio	Carbon oxidation factor of diesel fuel in 2008	National Inventory Report of Ukraine 1990-2010 p. 475 (values for mobile combustion overview)	0.99
$OXID_{diesel,y}$	ratio	Carbon oxidation factor of diesel fuel in 2009	National Inventory Report of Ukraine 1990-2010 p. 478 (values for mobile combustion overview)	0.99
$OXID_{diesel,y}$	ratio	Carbon oxidation factor of diesel fuel in 2010 and after	National Inventory Report of Ukraine 1990-2010 p. 481 (values for mobile combustion overview)	0.99
$k^{C}_{diesel,y}$	t C/TJ	Carbon content of diesel fuel in 2008	National Inventory Report of Ukraine 1990-2010 p. 474 (values for mobile combustion overview)	20.20
$k^{C}_{diesel,y}$	t C/TJ	Carbon content of diesel fuel in 2009	National Inventory Report of Ukraine 1990-2010 p. 477 (values for mobile combustion overview)	20.20
$k^{C}_{diesel,y}$	t C/TJ	Carbon content of diesel fuel in 2010 and after	National Inventory Report of Ukraine 1990-2010 p. 480 (values for mobile combustion overview)	20.20
$EF_{grid,y}$	t CO_2/MWh	Specific indirect carbon dioxide emissions during the consumption of electric energy by the 2nd class electricity consumers according to Procedure for determining consumers' classes, approved by Resolution of the National Electricity Regulatory Commission of Ukraine dated	In 2008 – National Environmental Investment Agency Order No.62 dated 15.04.2011[60]	1.219
			In 2009 – National Environmental Investment Agency Order No.63 dated 15.04.2011[61]	1.237
			In 2010 – National Environmental	1.225

[60] http://www.neia.gov.ua/nature/doccatalog/document?id=127171
[61] http://www.neia.gov.ua/nature/doccatalog/document?id=127172

		13.08.1998 # 1052	Investment Agency Order No.43 dated 28.03.2011[62]	
			In 2011 and after – National Environmental Investment Agency Order No.75 dated 12.05.2011[63]	1.227

The 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.

Parameters such as net calorific value of coal and diesel fuel, carbon content in coal and diesel fuel, carbon oxidation factor of coal and diesel fuel, specific indirect carbon dioxide emissions during electricity consumption and average electricity consumption per tonne of coal produced that are presented in the table above may be reviewed at the stage of monitoring under the new publications of relevant documents containing this information.

The data and parameters that are monitored throughout the crediting period:

These data are presented in Sections D.1.1.1.; D.1.1.3. and D.1.3.1. of this project development document.

Setup of measurement installation

Measurement of certain parameters that are to be monitored in this project goes as follows:

- Amount of electricity consumed in the project activity is measured using the special meter which is a multifunction device for measurement of electric energy. This device requires calibration according to specifications and national standards of Ukraine. In case of any deviation in indications of electric meter, its replacement by another device will be made.
- Amount of coal extracted from the waste heap is measured using special railway scales, which are the property of the mine “Schehlivska-Hlyboka”. Control of functionality of these scales is carried out by personnel of the mine in accordance with the specifications of the device and the national standards.
- Amount of consumed diesel fuel will be monitored on spending bills, receipts of purchased fuel and other accounting documents.
  Indicators of ash and water content of the sorted coal fractions are determined by the independent laboratory that conducts analysis of each batch of coal, and presents the results in certificates of products quality. The buyer of coal products has free access to this information. Procedures for conducting studies meet national standards of Ukraine.

[62] http://www.neia.gov.ua/nature/doccatalog/document?id=126006
[63] http://www.neia.gov.ua/nature/doccatalog/document?id=127498

Calibration of measuring devices and equipment

Calibration of measuring equipment will be performed periodically, in accordance with technical regulations of the Host country. Calibration should be carried out by authorized representatives of the State Metrological System of Ukraine.

For electricity meter of "**SAZU-I670I**" type interval between calibrations is six years.
For electricity meter of **"EPQS 122.21.19SS**" type interval between calibrations is six years.
For automobile scales of "**RS200-D24**" type interval between calibrations is six months.

Correspondence of monitoring procedures to the standard ones in the sector

Used monitoring procedure is in accordance with the standard procedures for projects of this type and prevailing practice in the sector. These monitoring plans of the projects can be given as an example of the standard monitoring procedures : UA2000020 Waste heaps dismantling with the aim of decreasing the greenhouse gases emissions into the atmosphere [64]; UA2000034 Processing of waste heaps at Monolith-Ukraine[65].

Approach to the monitoring in this project fully meets standard ones in the sector and includes monitoring of amount of coal extracted from the waste heap, of the amount of fuel consumed in the project and of the amount of electricity consumed in the project. Additional parameters of monitoring (ash and water content of coal extracted from the heaps, emission factors, etc.) are used to improve the accuracy of the monitoring and correspond the used approach for baseline setting and monitoring in the project.

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

[64] http://ji.unfccc.int/JI_Projects/DB/VOZK3HERSNQGFLCY0YZ3AX5W676M5R/Determination/Bureau%20Veritas%20Certification1277814730.41/viewDeterminationReport.html

[65] http://ji.unfccc.int/JI_Projects/DB/IPT7L3CLGIZTGGX27T2101W7XCUCWW/Determination/DNV-CUK1315829182.27/viewDeterminationReport.html

Training of monitoring personnel

The project will utilize technology that requires skills and knowledge in heavy machinery operation, coal beneficiation technology operation, electric equipment operation etc. 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.

Activities that are directly related to the monitoring do not require specific training other than provided by the professional education. Thus, personnel, responsible for monitoring, will receive training on monitoring procedures and requirements, and also will receive necessary training and consultations on Kyoto Protocol, JI projects and monitoring from project consultant – PE “MC “Metropoliya”.

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

In cases if any errors, fraud, inconsistencies or situations when monitoring data are unavailable will be identified during the monitoring process special commission will appointed by project host management that will conduct a review of such case and issue an order that must also include provisions for necessary corrective actions to be implemented that will ensure such situations are avoided in future.

The project host management of the company, where the project is implemented, has to 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. All 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 consultant – PE “MC “Metropoliya” – will conduct periodic review of the monitoring plan and procedures and if necessary propose improvements to the project participants.

Procedures that will be implemented if expected data from any sources are not available

For data and parameters, monitoring of which is not made during the whole crediting period, and the values are determined only once (and remain unchanged during the whole crediting period) and are available or unavailable at the stage of determination of the PDD, the values indicated in the PDD are used. If updated data are not available, last the most accurate data will be used (e. g. of the previous period).

For data and parameters, which are monitored during the whole crediting period, standard procedures in this sector for each data type are used. For example cross-checking with suppliers and consumers, receiving estimated values, averaging etc. In each case, changing the method of receiving data will be recorded and displayed in the monitoring report.

Emergency preparedness for cases where emergencies can cause unintended emissions

The project operation does not foresee any factors or emergencies that can cause unintended GHG emissions. Safe operation of equipment and personnel is ensured by systematic safety training. Procedures for dealing with general emergencies such as fire, major malfunctions etc. are developed as part of the mandatory business regulations and are in accordance with local requirements.

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	$EC_{PJ,y}$ - Additional electricity consumed in period *y* as a result of the implementation of the project activity	Data of company, electricity meters	MWh[66]	m/c	Continuous measurement. Monthly reports	100%	Electronic and paper	This parameter is registered with a specialized electricity meter

[66]Data from the meters are measured in kWh. For convenience of calculations this parameter is presented in MWh

2	$FC_{PJ,Diesel,y}$ - Amount of diesel fuel consumed as a result of the project activity in period *y*	Data of company	t	m	monthly	100%	Electronic and paper	For the metering of this parameter the commercial data are used. Receipts and other accounting data are used in order to confirm the amount of fuel consumed.
3	$EF_{grid,y}$ - Specific carbon dioxide emissions during production of electricity at thermal power plants and during its consumption	See Section D.1. Fixed ex-ante	t CO_2/MWh	e	Fixed ex-ante	100%	Electronic	Values are provided by DFP of Ukraine annually
4	$NCV_{Diesel,y}$ - Net Calorific Value of diesel fuel in period *y*	National Inventory Report of Ukraine 1990-2010 (values for mobile combustion overview)	TJ/kt	e	Fixed ex-ante	100%	Electronic and paper	Latest country-specific data. Data are available at the moment of determination

5	$OXID_{Diesel,y}$ - Carbon oxidation factor of diesel fuel in period y	National Inventory Report of Ukraine 1990-2010 (values for mobile combustion overview)	ratio	e	Fixed ex-ante	100%	Electronic and paper	Latest country-specific data. Data are available at the moment of determination
6	$k^{C}_{Diesel,y}$ - Carbon content of diesel fuel in period y	National Inventory Report of Ukraine 1990-2010 (values for mobile combustion overview)	t C/TJ	e	Fixed ex-ante	100%	Electronic and paper	Latest country-specific data. Data are available at the moment of determination

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

Calculation results are presented in metric tons of carbon dioxide equivalent (tCO_2e), 1 metric ton of carbon dioxide equivalent is equal to 1 metric ton of carbon dioxide (CO_2), i.e. 1 tCO_2e = 1 tCO_2.

Emissions from the project activity are calculated as follows:

$$PE_y = PE_{EL,y} + PE_{Diesel,y} , \quad \text{(Equation 8)}$$

where:

PE_y, - project emissions due to project activity in period y, tonnes CO_2 equivalent;

$PE_{EL,y}$ - project emissions due to consumption of electricity from the grid by the project activity in period *y*, tonnes CO_2 equivalent;

$PE_{Diesel,y}$ - project emissions due to consumption of diesel fuel by the project activity in period *y*, tonnes CO_2 equivalent.

Components of project emissions, in turn, are calculated as:

$$PE_{EL,y} = EC_{PJ,y} \cdot EF_{grid,y},$$ (Equation 9)

where:

$EC_{PJ,y}$ - Additional electricity consumed in period *y* as a result of the implementation of the project activity, MWh;

$EF_{grid,y}$ - Specific indirect carbon dioxide emissions during the consumption of electric energy by the 2nd class electricity consumers according to Procedure for determining consumers' classes, approved by Resolution of the National Electricity Regulatory Commission of Ukraine dated 13.08.1998 # 1052, tCO_2/MWh.

$$PE_{Diesel,y} = \frac{FC_{PJ,Diesel,y}}{1000} \cdot NCV_{Diesel,y} \cdot OXID_{Diesel,y} \cdot k^{C}_{Diesel,y} \cdot 44/12,$$ (Equation 10)

where:

$FC_{PJ,Diesel,y}$ - Amount of diesel fuel consumed as a result of the project activity in period *y*, t;

$NCV_{Diesel,y}$ - Net calorific value of diesel fuel, TJ/kt;

$OXID_{Diesel}$ - Carbon oxidation factor of diesel fuel in period *y*, ratio;

$k^{C}_{Diesel,y}$ - Carbon content of diesel fuel in period *y*, t C/TJ;

$44/12$ - Ration between molecular mass of CO_2 and C. Reflect oxidation of C to CO_2.

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
1	$FR_{Coal,y}$ - Amount of beneficiated sorted fraction , which is extracted from the waste heaps because of the project activity in period y	Data of company	t	m/c	Each party is measured continuously	100%	Electronic and paper	For the metering of this parameter the commercial data of the company are used. This parameter is registered by means of special scales.
2	$FC_{BE,Coal,y}$ - Amount of coal that would be extracted in mines under baseline scenario and burned for energy production in period	Result of calculation by formula (3)	t	c	Monthly	100%	Electronic and paper	Calculated according to equation 3, Section B.1. Data are available at the moment of determination.

3	$A_{sort,y}$ - Average ash content of beneficiated sorted fraction, which is extracted from the waste heaps as a result of the project implementation in period *y*	Acceptance Certificate of coal products	%	m/c	Annually	100%	Electronic and paper	Certificate of quality of coal products based on laboratory studies
4	$W_{sort,y}$ - Average water content of beneficiated sorted fraction, which is extracted from the waste heaps as a result of the project implementation in period y	Acceptance Certificate of coal products	%	m/c	Annually	100%	Electronic and paper	Certificate of quality of coal products based on laboratory studies

5	$A_{coal,y}$ - Average ash content of thermal coal produced in Donetsk region of Ukraine in period *y*	See section D.1	%	m	Fixed ex-ante	100%	Electronic and paper	Statistical data. Data are available at the moment of determination.
6	$W_{coal,y}$ - Average water content of thermal coal produced in Donetsk region of Ukraine in period *y*	See section D.1	%	m	Fixed ex-ante	100%	Electronic and paper	Statistical data. Data are available at the moment of determination.
7	$NCV_{Coal,y}$ - Net calorific value of coal in period y	National Inventory Report of Ukraine 1990-2010 (1.A.1.a – Public Electricity and Heat Production)	TJ/kt	e	Fixed ex-ante	100%	Electronic and paper	Latest country-specific data. Data are available at the moment of determination
8	$OXID_{Coal,y}$ - Carbon oxidation factor of coal in period *y*	National Inventory Report of Ukraine 1990-2010 (1.A.1.a – Public Electricity and Heat Production)	ratio	e	Fixed ex-ante	100%	Electronic and paper	Latest country-specific data. Data are available at the moment of determination

9	$k^{C}_{Coal,y}$ - Carbon content of coal in period *y*	National Inventory Report of Ukraine 1990-2010 (1.A.1.a – Public Electricity and Heat Production)	t C/TJ	e	Fixed ex-ante	100%	Electronic and paper	Latest country-specific data. Data are available at the moment of determination
10	p_{WHB} - Correction factor for the uncertainty of the waste heap burning process	Scientific research– Report on the fire risk of Donetsk Region's waste heaps, Scientific Research Institute "Respirator", Donetsk, 2012	ratio	e	Fixed ex-ante	100%	Electronic and paper	Latest country-specific data. Data are available at the moment of determination

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

Calculation results are presented in metric tons of carbon dioxide equivalent (tCO_2e), 1 metric ton of carbon dioxide equivalent is equal to 1 metric ton of carbon dioxide (CO_2), i.e. 1 tCO_2e = 1 tCO_2.

Emissions in the baseline scenario are calculated as follows:

$$BE_y = BE_{WHB,y}$$ (Equation 11),

where:

BE_y, - Emissions in the baseline scenario in period *y*, tonnes of CO_2 equivalent,

$BE_{WHB,y}$ - Baseline emissions due to burning of the waste heaps in period *y*, tonnes of CO_2 equivalent.

Baseline emissions due to burning of the waste heaps are, in turn, calculated as:

$$BE_{WHB} = \frac{FC_{BE,Coal,y}}{1000} \cdot p_{WHB} \cdot NCV_{Coal} \cdot OXID_{Coal} \cdot k^{C}_{Coal} \cdot 44/12, \quad \text{(Equation 12)}$$

where:

$FC_{BE,Coal,y}$ - Amount of coal that would have been mined in the baseline scenario and combusted for energy use, in period *y*, t;

ρ_{WHB} - Correction factor that takes into account the uncertainty of the waste heap burning process, ratio;

$NCV_{Coal,y}$ - Net calorific value of coal in period *y*, TJ/kt;

$OXID_{Coal,y}$ - Carbon oxidation factor of coal in period *y*, ratio;

$k^{C}_{Coal,y}$ - Carbon content of coal in period *y*, tC/TJ;

44/12 - ration between molecular mass of CO_2 and C. Reflect oxidation of C to CO_2.

1/1000 - physical transformation [t] in [kt] for calculation purposes.

Amount of coal that would have been mined in the baseline scenario is calculated by the equation:

$$FC_{BE,coal,y} = FR_{coal,y} \cdot \frac{\left(1 - \frac{A_{coal}}{100} - \frac{W_{coal}}{100}\right)}{\left(1 - \frac{A_{rock}}{100} - \frac{W_{rock}}{100}\right)} \quad \text{(Equation 13)}$$

where:

$FR_{coal,y}$ - Amount of beneficiated sorted fraction extracted from the waste heaps because as a result of the project implementation in period *y*, t;

$A_{sort,y}$ Average ash content of beneficiated sorted fraction extracted from the waste heap as a result of the project implementation in period *y*, %;

$W_{sort,y}$ - Average water content of beneficiated sorted fractions extracted from the waste heap as a result of the project implementation in period *y*, %.

$A_{coal,y}$ - Average ash content of thermal coal, extracted in Donetsk region of Ukraine in period y, %;

$W_{coal,y}$ - Average water content of thermal coal, extracted in Donetsk region of Ukraine in period y, %;

1/100 - conversion factor from percent to fraction, ratio.

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

This section is left blank on purpose.

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

This section is left blank on purpose

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):

This section is left blank on purpose

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

This project will result in a net change in fugitive methane emissions due to the mining activities. As coal in the baseline scenario is only coming from mines it causes fugitive emissions of methane. These are calculated as standard country specific emission factor applied to the amount of coal that is

extracted from the waste heaps in the project scenario (which is the same as the amount of coal that would have been mined in the baseline scenario). Also, the project takes into account other sources which are observed in the operation of coal mines, namely, electricity consumption from the grid of Ukraine. Coal mines consume large amounts of electricity, so these emissions should be considered.
This leakage is significant and will be included in the monitoring plan and calculation of the project emission reductions.

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
1	$FR_{Coal,y}$ - Amount of beneficiated sorted fraction extracted from the waste heaps as a result of the project implementation in period *y*	Data of company	t	m/c	Each party is measured continuously	100%	Electronic and paper	For metering of this parameter the commercial data is used. This parameter is registered by means of special scales.
2	$FC_{BE,Coal,y}$ - Amount of coal that would be extracted in mines under baseline scenario and burned for energy production in period	Result of calculation by formula (3)	t	c	Monthly	100%	Electronic and paper	Calculated according to equation 3, Section B.1. Data are available at the moment of determination.
3	$EF_{CH_4,CM}$ -	See section D.1.	m^3/t	e	Fixed ex-ante	100%	Electronic and paper	Data are available at the moment of

	Fugitive methane emissions factor during coal extraction in mines in period *y*							determination.
4	ρ_{CH4}– Methane density under standard conditions	See section D.1.	t/m^3	e	Fixed ex-ante	100%	Electronic and paper	Data are available at the moment of determination.
5	GWP_{CH4}- Global warming potential of methane	See section D.1.	tCO_2e/tCH_4	e	Fixed ex-ante	100%	Electronic and paper	Data are available at the moment of determination.
6	$N^e_{coal,y}$ - Average electricity consumption per ton of coal, produced in Ukraine in period *y*	See section D.1.	MWh/t	e	Fixed ex-ante	100%	Electronic and paper	Statistical data. Data are available at the moment of determination.
7	$EF_{grid,y}$ - indicator of specific indirect carbon dioxide emissions during consumption of electric energy by consumers of electric energy in period *y*	See section D.1.	$t\ CO_2/MWh$	e	Fixed ex-ante	100%	Electronic and paper	Values are provided by DFP of Ukraine annually. Data are available at the moment of determination.

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

Leakages in period *y* are calculated as follows:

$$LE_y = LE_{CH_4,y} + LE_{EL,y}$$ (Equation 14)

where:

LE_y - Leakages as a result of the project implementation in period *y*, tonnes CO_2 equivalent;

$LE_{CH_4,y}$ - Leakages due to fugitive emissions of methane in the mining activities in period *y,* tonnes CO_2 equivalent;

$LE_{EL,y}$ - Leakages as a result of electricity consumption from energy grid during coal mining in period *y*, tonnes of CO_2 equivalent.

Leakages due to fugitive emissions of methane in the mining activities in period *y* are calculated as follows:

$$LE_{CH_4,y} = -FC_{BE,Coal,y} \cdot EF_{CH_4,CM} \cdot \rho_{CH_4} \cdot GWP_{CH_4}$$ (Equation 15)

where:

$FC_{BE,Coal,y}$ - Amount of coal that would have been mined in the baseline scenario and combusted for the energy production, in period *y,* t;

$EF_{CH_4,CM}$ - Fugitive methane emissions factor during coal mining , m^3/t;

ρ_{CH4} - Methane density, t/ m^3;

GWP_{CH4} - Global Warming Potential of Methane, tCO2e/tCH4.

Amount of coal that would have been mined in the baseline scenario and combusted for the energy production is calculated as follows:

$$FC_{BE,coal,y} = FR_{coal,y} \cdot \frac{\left(1 - \frac{A_{sort,y}}{100} - \frac{W_{sort,y}}{100}\right)}{\left(1 - \frac{A_{coal,y}}{100} - \frac{W_{coal,y}}{100}\right)}$$ (Equation 16)

where:

$FR_{coal,y}$ - Amount of beneficiated sorted fraction extracted from the waste heaps as a result of the project implementation in period *y* , t;

$A_{sort,y}$ - Average ash content of beneficiated sorted fraction extracted from the waste heaps as a result of the project implementation in period y , %;

$W_{sort,y}$ - Average water content of beneficiated sorted fraction extracted from the waste heaps as a result of the project implementation in period y , %;

$A_{coal,y}$ - Average ash content of thermal coal, extracted in Donetsk region of Ukraine in period y , %;

$W_{coal,y}$ - Average water content of thermal coal, extracted in Donetsk region of Ukraine in period y, %;

1/100 - conversion factor from percent to fraction, ratio.

Leakages as a result of electricity consumption from energy grid during coal mining in period *y* are calculated as follows:

$$LE_{EL,y} = -FC_{BE,Coal,y} \cdot N^{e}{}_{coal,y} \cdot EF_{CO_2,EL,y} \quad \text{(Equation 17)}$$

where:

$FC_{BE,coal,y}$ - Amount of coal that would have been mined in the baseline scenario and combusted for the energy production, in period *y,* t;

$N^{E}{}_{coal,y}$ - - Average electricity consumption per ton of coal, produced in Ukraine in period *y*, MWh/t;

$EF_{grid,y}$ - - Specific indirect carbon dioxide emissions during the consumption of electric energy by the 2nd class electricity consumers according to Procedure for determining consumers' classes, approved by Resolution of the National Electricity Regulatory Commission of Ukraine dated 13.08.1998 # 1052 in period *y,* t CO_2/MWh.

D.1.4. Description of formulae used to estimate emission reductions for the project (for each gas, source etc.; emissions/emission reductions in units of CO_2 equivalent):

Annual emission reductions are calculated as follows:

$$ER_y = BE_y - LE_y - PE_y \quad \text{(Equation 18)}$$

where:

ER_y – Emission reductions as a result of the project implementation in period *y*, tonnes CO_2 equivalent;

BE_y – Emissions in baseline scenario in period *y*, tonnes CO_2 equivalent;

PE_y – Project emissions as a result of the project implementation in period *y*, tonnes CO_2 equivalent;

LE_y – Leakages as a result of the project implementation in period *y*, tonnes CO_2 equivalent.

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:

Collection and archiving of the information on the environmental impacts of the project will be done based on the approved EIA in accordance with the Host Party legislation – *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 (see Section F.1).

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.
D.1.1.1. – ID 1	Low	The electricity meters are calibrated according to the procedures of the Host Party. Calibration interval is 6 years.
D.1.1.1. – ID 2	Low	This data is used in the commercial activity of the company. Accounting documentation will be used.
D.1.1.1. – ID 3	Low	This parameter is provided by DFP of Ukraine annually. If the value of the factor is not available at the moment of determination or verification, value for the previous year is taken into calculations.
D.1.1.1. – ID 4- ID 6	Low	Values of these parameters are taken according to the most actual source – National Inventory Report of Ukraine
D.1.1.3. – ID 1	Low	These data are used in the commercial activity of the company. Scales are calibrated in

		accordance with procedures of the Host part. Interval of calibration – 6 months.
D.1.1.3. – ID 2	Low	This parameter is calculated according to the formula (3) of this PDD
D.1.1.3. – ID 3	Low	This parameter is used in the commercial activity of the company. Laboratory studies
D.1.1.3. – ID 4	Low	This parameter is used in the commercial activity of the company. Laboratory studies
D.1.3.1. – ID 1	Low	These data are used in the commercial activity of the company. Scales are calibrated in accordance with procedures of the Host part. Interval of calibration – 6 months.
D.1.1.3. – ID 5- ID 6	Low	These parameters are defined in accordance with Guide of quality, volume of coal production and enrichment products in 2008-2010, Ministry of Coal Industry of Ukraine, State Committee of Ukraine. This source provides clear and transparent information.
D.1.1.3. – ID 7- ID 9	Low	Values of these parameters are taken according to the most actual source – National Inventory Report of Ukraine
D.1.1.3. – ID 10	Low	Actual research of Scientific Research Institute “Respirator”,
D.1.3.1. - ID 1	Low	These data are used in the commercial activity of the company. Scales are calibrated in accordance with procedures of the Host part. Interval of calibration – 6 months.
D.1.3.1. - ID 2	Low	This parameter is calculated according to the formula (3) of this PDD
D.1.3.1. - ID 3	Low	Values of these parameters are taken according to the most actual source – National Inventory Report of Ukraine
D.1.3.1. - ID 4	Low	Used international generally accepted values provided by IPCC
D.1.3.1. - ID 5	Low	Used international generally accepted values provided by IPCC
D.1.3.1. - ID 6	Low	Actual statistics for the country that are provided by State Statistics authority
D.1.3.1. - ID 7	Low	This parameter is provided by DFP of Ukraine annually. If the value of the factor is not available at the moment of determination or verification, value for the previous year is taken into calculations.

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

The project owner, which will implement the provisions of this monitoring plan in the structure of organization and quality management, is “RIGHT” LLC. Management headed by the director of the enterprise is responsible for the implementation of monitoring, data collection, registration, visualization, storage and reporting of data that were monitored and periodic verifications of measuring devices. Detailed structure of the administrative board of the company will be established in Monitoring report before the primary and the first verification. The basic structure is demonstrated by the following block diagram:

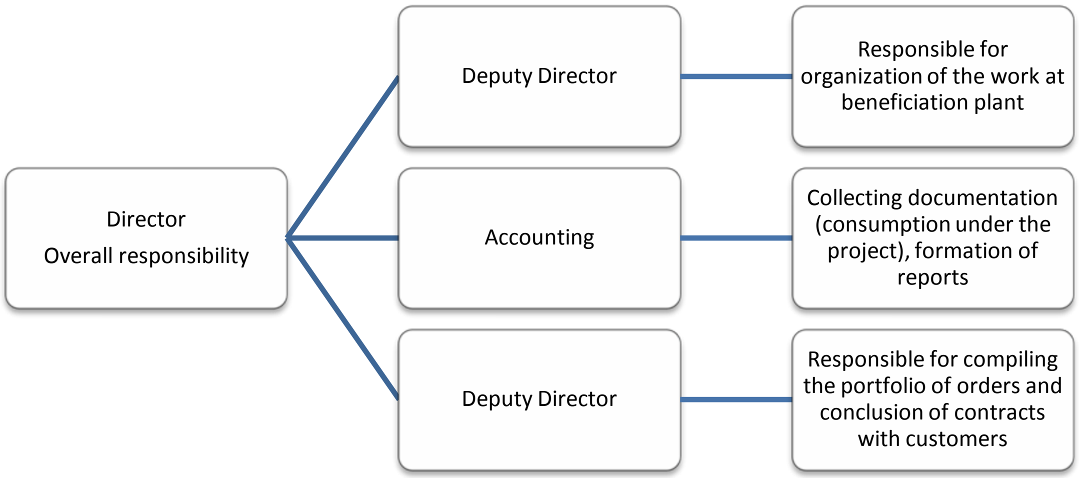


Figure 10: Block diagram of monitoring.

The project involves the following management system:
Director of "RIGHT" LLC has overall responsibility for implementation of the project activities and for monitoring. Deputy Director is directly responsible for organization of works at the object. He coordinates all issues concerning the operation of installation, repairs, modernization, etc. The second Deputy Director is responsible for finding a sales market of the final products. He compiles portfolio of orders and conclude contracts with customers. All information under the project on resources consumption or production volumes goes to the accounting department. This department accumulates necessary information on consumption of electricity, of diesel fuel and on processing volumes of coal and rock mass and production of concentrate. Based on these data, technical reports and accounting documents are formed. The control system is well organized by enterprise that promotes safe and accurate collection and identification of data.

D.4. Name of persons/entities establishing the monitoring plan:

Monitoring plan is developed by PE "MC "Metropoliya", not a project participant.
Monitoring plan is enforceable for "RIGHT" LLC, project participant.

SECTION E. Estimation of greenhouse gas emission reductions

E.1. Estimated project emissions:

The formulas used to estimate the project anthropogenic emissions by sources of greenhouse gas emissions, description of calculations by these formulas and all the assumptions used are described in Section D.1.1.2.

Table 15. Estimated project emissions during the crediting period

Project emission	Unit	2008	2009	2010	2011	2012	Total
Project emissions due to consumption of electricity from the grid as a result of the implementation of the project activity in period *y*	tCO_2e	5 681	1 919	1 132	1 609	911	**11252**
Project emissions due to consumption of diesel fuel as a result of the implementation of the project activity in period *y*	tCO_2e	1 077	370	317	312	197	**2273**
Total project emissions over the crediting period	tCO_2e	6 758	2 289	1 449	1 921	1 108	**13525**

Table 16. Estimated project emissions after the crediting period

Project emission	Unit	Annual emissions	Total
Project emissions due to consumption of electricity from the grid as a result of the implementation of the project activity in period *y*	tCO_2e	2255	18040
Project emissions due to consumption of diesel fuel as a result of the implementation of the project activity in period *y*	tCO_2e	455	3640
Total Project emissions after the crediting period	tCO_2e	2710	21680

E.2. Estimated leakage:

The formulas used to estimate the leakage under the project activities, description of calculations by these formulas and all the assumptions used are described in Section D.1.3.

Table 17. Estimated leakages during the crediting period

Leakages	Unit	2008	2009	2010	2011	2012	Total
Leakages due to fugitive emissions of methane in the mining activities in the period *y*	tCO_2e	-171 303	-68 120	-52 509	-57 006	-30 094	**-379032**
Leakages as a result of electricity consumption during coal mining in period *y*	tCO_2e	-50 763	-21 114	-16 492	-16 306	-8 608	**-113283**
Total leakages during the crediting period	tCO_2e	-222 066	-89 234	-69 001	-73 312	-38 702	**-492315**

Table 18. Estimated leakages after the crediting period

Leakages	Unit	Annual emissions	Total
Leakages due to fugitive emissions of methane in the mining activities in period *y*	tCO_2e	-75 357	-602 856
Leakages as a result of electricity consumption during coal mining in period *y*	tCO_2e	-21 556	-172 448
Total leakages after the crediting period	tCO_2e	**-96 913**	**-775 304**

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

Table 19. Estimated total project emissions during the crediting period

Total Project emissions during the crediting period	Unit	2008	2009	2010	2011	2012	Total
	tCO_2e	6 758	2 289	1 449	1 921	1 108	13 525

Table 20. Estimated total project emissions during the crediting period

Total Project emissions after the crediting period	Unit	Annual emissions	Total
	tCO_2e	2 710	21 680

E.4. Estimated baseline emissions:

Table 21. Estimated baseline emissions during the crediting period

Baseline emissions	Unit	2008	2009	2010	2011	2012	Total
Baseline emissions due to burning of the waste heap in period *y*	tCO_2e	775 528	312 939	238 947	259 411	136 946	**1 723 771**

Baseline emissions over the crediting period	tCO_2e	775 528	312 939	238 947	259 411	136 946	**1 723 771**

Table 22. Estimated baseline emissions after the crediting period

Baseline emissions	Unit	Annual emissions	Total
Baseline emissions due to burning of the waste heap	tCO_2e	342 915	2 743 320
Baseline emissions after the crediting period	tCO_2e	**342 915**	**2 743 320**

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

Table 23. Estimated emission reductions during the crediting period

Emission reductions during the crediting period	**Unit**	**2008**	**2009**	**2010**	**2011**	**2012**	**Total**
	tCO_2e	990 836	399 884	306 499	330 802	174 540	**2 202 561**

Table 24. Estimated emission reductions after the crediting period

Emission reductions after the crediting period	Unit	Annual emissions	Total
	tCO_2e	437 118	**3 496 944**

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

Table 25. Estimated balance of emissions under the proposed project over the crediting period

Year	Estimated Project Emissions (tonnes CO_2 equivalent)	Estimated Leakage (tonnes CO_2 equivalent)	Estimated Baseline Emissions (tonnes CO_2 equivalent)	Estimated Emissions Reductions (tonnes CO_2 equivalent)
2008	6 758	-222066	775528	990 836
2009	2289	-89234	312939	399 884
2010	1449	-69001	238947	306 499
2011	1921	-73312	259411	330 802
2012	1108	-38702	136946	174 540
Total (tonnes CO_2 equivalent)	**13525**	**-492315**	**1 723 771**	**2 202 561**

Table 26. Estimated balance of emissions under the proposed project after the crediting period

Year	Estimated	Estimated	Estimated	Estimated

	Project Emissions (tonnes CO_2 equivalent)	Leakage (tonnes CO_2 equivalent)	Baseline Emissions (tonnes CO_2 equivalent)	Emissions Reductions (tonnes CO_2 equivalent)
Year 2013	2 710	-96 913	342 915	437 118
Year 2014	2 710	-96 913	342 915	437 118
Year 2015	2 710	-96 913	342 915	437 118
Year 2016	2 710	-96 913	342 915	437 118
Year 2017	2 710	-96 913	342 915	437 118
Year 2018	2 710	-96 913	342 915	437 118
Year 2019	2 710	-96 913	342 915	437 118
Year 2020	2 710	-96 913	342 915	437 118
Total (tonnes CO_2 equivalent)	21 680	-775 304	2 743 320	3 496 944

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[67] (Title: “Structure and Contents of the Environmental Impact Assessment Report (EIR) for Designing and Construction of Production Facilities, Buildings and Structures”).

In Annex F of this standard there is a list of “types of projects or activities that are of high environmental hazard” for which full-scale EIA is obligatory, Ministry of Environment and Natural Resources of Ukraine is competent authority for performing of it. Project activities that consist of utilization of wastes of coal industry and of coal production are included in this list.

Comprehensive EIA according to the legislation of Ukraine was performed for the proposed project. Here are some general conclusions of this EIA:

- Impact on atmospheric air: according to the proposed activity of the point for processing of coal and rock mass, coal dust and inorganic dust are emitted in atmospheric air; the dust contains SiO_2 70-20%. According to the results of calculation of scattering it is stated that on the boundary of sanitary protection zone of the point for processing bulk materials and on the boundary of the nearest residential buildings pollution of surface layer of the atmosphere by these types of dust as well as total dust content, taking into account background air pollution does not exceed the maximum permissible concentration;
- There is no impact on the water. Project activity of the point for processing of coal and rock mass will not affect the superficial and underground (ground) water because there are no sources of such pollution. Project equipment and beneficiation technology of coal and rock mass excludes the use of water. Water used for household needs on-site, is delivered by tank truck;
- There is no impact on flora and fauna. Planned activity of the point for processing bulk materials will not lead to depletion and degradation of plant groups and fauna of surrounding area, to their accumulation of harmful substances;
- Noise impact is limited. The main source of noise will be at the minimum desired distance from residential areas, mobile sources as for noise (traffic) provisions of local standards will be met;
- Impact on depths;
- Impact on landscapes: there is no impact as site of construction is located in industrial zone;
- Impact on society: the project activity does not render negative impact on public health because in the area of nearest residential buildings the level of pollution of surface layer of the atmosphere by project emissions is lower than the maximum permissible concentration, sound pressure level is lower that acceptable standards, there are no other sources of influence. All necessary measures are provided by working project, they are directed to protecting of staff from possible negative impact in accordance with sanitary standards.
- There are no transboundary effects. There are no impacts which occur on the territory of any other country, and which are caused by the implementation of this project that is physically located entirely within Ukraine.

[67] *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

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:

Comprehensive EIA was performed in 2007 by PE PB "Ekoservis". This study was focused on the impact of waste heaps dismantling on the environment. Conclusions of the report are above in section F.1. Project impact on the environment is not significant and harmful. According to Ukrainian laws and regulations, preparation of reports from Environmental Impact Assessment and positive conclusions of State Department of Ecology and Natural Resources makes procedure of environmental impact assessment.

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 a part of EIA, stakeholders must be informed via mass media about the proposed project as provided in *State construction standards of Ukraine DBN A.2.2.-1-2003: "Structure and Contents of the Environmental Impact Assessment (EIA) materials during design and construction of enterprises, buildings and structures"* issued by State Committee of Construction and Architecture in 2004. In accordance with the mentioned regulations, the relevant information was published in the local newspaper "Allo Makiivka" #48 (68) dated 23.12.2007. No comments were received.

Annex 1

CONTACT INFORMATION ON PROJECT PARTICIPANTS

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Annex 2

BASELINE INFORMATION

Table containing the key elements of the baseline

#	Parameter	Unit	Data source
1	$FC_{BE,Coal,y}$ - Amount of coal that would have been mined in the baseline scenario and combusted for energy production, in period *y*	t	Calculated according to the equation (3), Section B.1. Documents of the project owner
2	$FR_{Coal,y}$ - Amount of beneficiated sorted fraction extracted from the waste heaps as a result of the project implementation in period *y*	t	Documents of the project owner
3	$A_{sort,y}$ - Average ash content of beneficiated sorted fraction extracted from waste heaps as a result of the project implementation in period y	%	Documents of the project owner. Laboratory study
4	$W_{sort,y}$ - Average water content of beneficiated sorted fraction extracted from waste heaps as a result of the project implementation in period y	%	Documents of the project owner. Laboratory study
5	$A_{coal,y}$ - Average ash content of thermal coal extracted in Donetsk region of Ukraine in period y	%	Guide of quality, volume of coal production and enrichment products in 2008-2010, Ministry of Coal Industry of Ukraine, State Committee of Ukraine (see Annex 4)
6	$W_{coal,y}$ – Average water content of thermal coal extracted in Donetsk region of Ukraine in period y	%	Guide of quality, volume of coal production and enrichment products in 2008-2010, Ministry of Coal Industry of Ukraine, State Committee of Ukraine (see Annex 4)
7	$EF_{CH_4,CM}$ - Fugitive methane emissions factor during coal mining	m^3/t	National Inventory Report of Ukraine 1990-2009 p. 90
8	p_{WHB} - Correction factor that takes into account the uncertainty of the waste heap burning process.	ratio	Report on the fire risk of Donetsk Region’s waste heaps, Scientific Research Institute “Respirator”, Donetsk, 2012

9	GWP_{CH4} - Global Warming Potential of Methane	tCO_2e/tCH_4	IPCC Second Assessment Report[68]
10	ρ_{CH4} - methane density	t/m^3	2006 IPCC "IPCC Guidelines for National Greenhouse Gas Inventories", Volume 2: Energy. Section 4: Fugitive emissions, p.4.12. According to standard conditions (temperature 20°C; pressure 101325 Pa)[69] Measurement units have been converted from $Gg\cdot m^{-3}$ to t/m^3.
11	$NCV_{Coal,y}$ - Net Calorific Value of coal in period *y*	TJ/kt	National Inventory Report of Ukraine 1990-2010.
12	$OXID_{Coal,y}$ - Carbon Oxidation factor of coal in period *y*	ratio	National Inventory Report of Ukraine 1990-2010
13	$k^C_{Coal,y}$ - Carbon content of coal in period *y*	tC/TJ	National Inventory Report of Ukraine 1990-2010
14	$N^e_{coal,y}$ - Average electricity consumption per ton of coal, produced in Ukraine in period *y*	MWh/t	State Statistics Service of Ukraine. Fuel and energy resources of Ukraine, Statistical Yearbook, Kyiv 2009, State Statistics Service of Ukraine. Fuel and energy resources of Ukraine, Statistical Yearbook, Kyiv 2011; State Statistics Service of Ukraine. Bulletin "The results of the fuel, heat and electric power consumption" for 2011. See also Annex 5.
15	$EF_{grid,y}$ - Specific indirect carbon dioxide emissions during the consumption of electric energy by the 2nd class electricity consumers according to Procedure for determining consumers' classes, approved by Resolution of the National Electricity Regulatory Commission of Ukraine dated 13.08.1998 # 1052.	tCO_2/MWh	In 2008 – National Environmental Investment Agency Order No.62 dated 15.04.2011 In 2009 – National Environmental Investment Agency Order No.63 dated 15.04.2011 In 2010 – National Environmental Investment Agency Order No.43 dated 28.03.2011 In 2011 and after – National Environmental Investment Agency Order No.75 dated 12.05.2011

[68] *"IPCC Second Assessment: Climate Change 1995. A Report of the Intergovernmental Panel on Climate Change"*. *Bolin, B. et al. (1995). IPCC website.* http://www.ipcc.ch/pdf/climate-changes-1995/ipcc-2nd-assessment/2nd-assessment-en.pdf.

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

Annex 3

MONITORING PLAN

Monitoring plan is described in Section D of this PDD.

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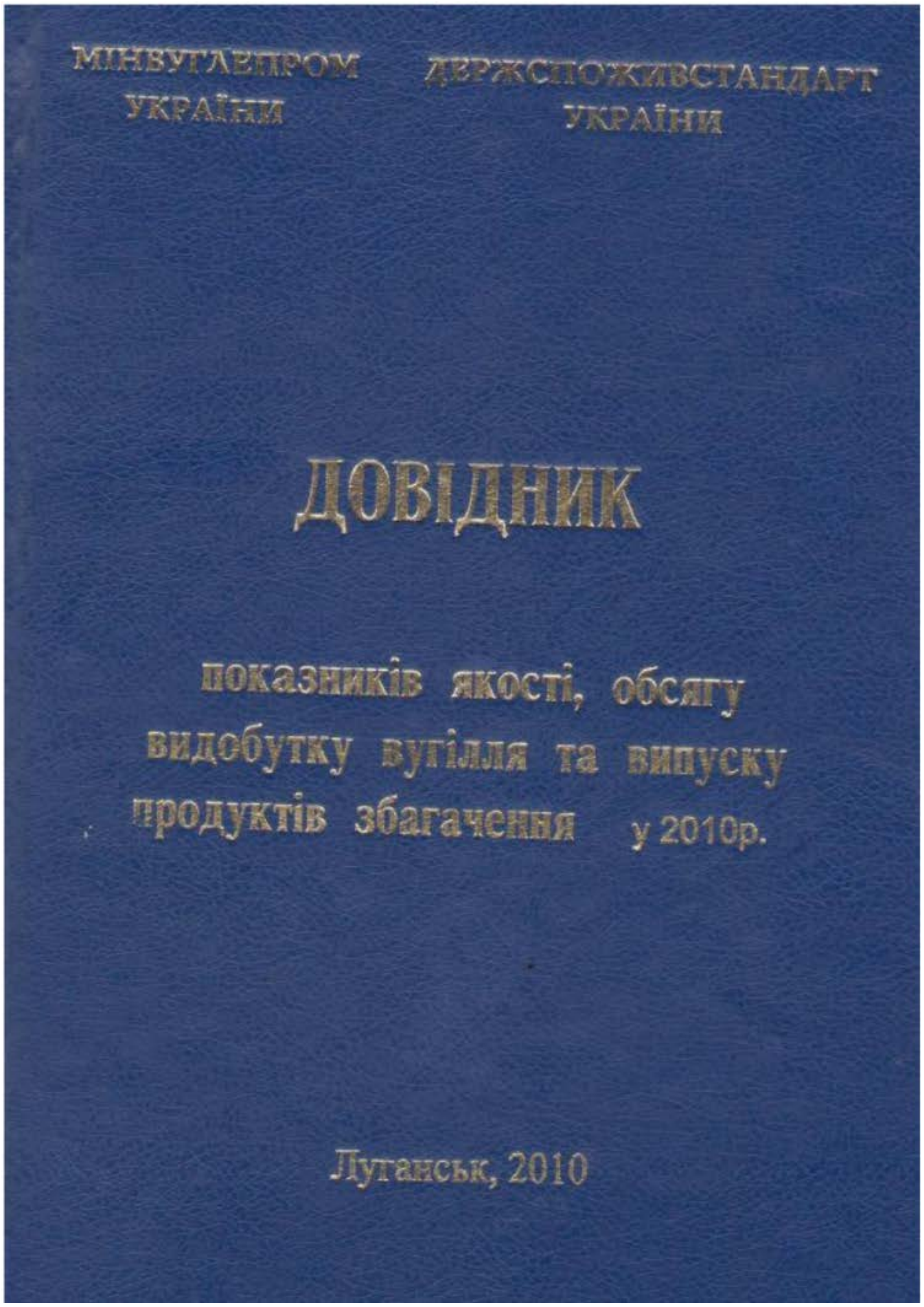
Annex 4

EXTRACTS FROM THE "REFERENCE BOOK OF QUALITY INDICATORS, VOLUME OF COAL PRODUCTION AND BENEFICIATION PRODUCTS IN 2008-2010"[70]



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

Table 27. Coal extraction in mines and stripe mines 2010

Найменування шахти	Дольова участь пластів у видобутку вугілля по шахті у 2010 році, %	Марка вугілля ДСТУ 3472-96		Фактичний видобуток рядового вугілля у 2009 році		Видобуток рядового вугілля, що планується у 2010 році				Класифікаційні параметри			
		кокс.	енерг.	тис. т	Зольність A^d, %	тис. т	Зольність A^d, %	Сірка S^d_t, %	Волога W^r_t, %	Середній показник відбиття вітриніту R_o, %	Товщина пластичного шару Y, мм	Вихід летких речовин на сухий стан V^{daf}, %	Вища теплота згорання Q_s^{daf}, ккал/кг
МІНВУГЛЕПРОМ УКРАЇНИ				72522,5	38,6	76204,5	38,9	2,0	7,7	-	-	26,5	8166
у тому числі:													
енергетичне вугілля				50458,0	39,2	52135,8	38,9	2,0	8,2	-	-	24,5	8025
			Д	273,2	49,0	200,0	42,1	2,4	13,5	0,57	0	39,5	7487
			ДГ	13663,1	39,9	15455,7	39,4	1,7	11,7	0,58	8	41,5	8089
			Г	12929,9	42,5	12775,1	41,4	2,7	7,6	0,77	12	38,4	7586
			Ж	435,1	35,3	316,0	43,0	3,3	4,0	0,88	23	36,1	8365
			П	7806,1	35,2	8303,0	36,4	2,8	5,5	2,43	0	8,4	8520
			А	15350,6	37,6	15086,0	37,7	1,3	6,6	4,55	0	3,7	8059
коксівне вугілля				22064,5	37,2	24068,7	39,0	2,1	6,7	-	-	30,9	8470
		ДГ		567,4	32,8	53,3	33,2	1,2	10,2	0,61	9	39,6	8210
		Г		2855,0	34,9	4532,7	36,1	2,2	6,9	0,77	14	38,3	8364
		Ж		8388,1	37,5	9807,7	39,0	2,4	6,6	0,96	22	33,0	8383
		К		9430,9	38,1	8694,0	40,8	1,6	6,7	1,23	18	26,1	8605
		ПС		823,1	35,3	981,0	35,7	2,8	6,4	1,61	10	18,2	8650

Найменування шахти	Дольова участь пластів у видобутку вугілля по шахті у 2010 році, %	[illegible]		[illegible]		[illegible]				[illegible]			
		кокс.	енерг.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Підпорядковані Мінвуглепрому				38395,5	39,6	39066,0	39,7	2,1	7,1	-	-	21,0	8193
у тому числі:													
енергетичне вугілля				31265,0	40,0	32171,0	40,0	2,1	7,2	-	-	19,4	8123
			Д	273,2	49,0	200,0	42,1	2,4	13,5	0,6	0	39,5	7487,0
			ДГ	2748,8	43,1	3205,0	41,2	2,6	9,9	0,61	8	40,6	7915
			Г	9645,4	43,6	10332,0	43,5	2,8	7,4	0,78	12	38,1	8174
			Ж	435,1	35,3	316,0	43,0	3,3	4,0	0,90	23	36,1	8365
			П	2811,9	36,8	3032,0	37,9	2,7	6,6	2,30	0	8,6	8503
			А	15350,6	37,6	15086,0	37,7	1,3	6,6	4,55	0	3,7	8059
коксівне вугілля				7130,5	37,8	6895,0	38,5	2,5	6,7	-	-	28,2	8523
		Г		1452,5	35,5	1360,0	37,0	1,8	6,6	0,80	14	36,6	8385
		Ж		2358,0	35,4	2150,0	37,2	2,6	6,8	1,02	21	32,4	8437
		К		2496,9	42,1	2404,0	41,7	2,7	6,7	1,33	21	23,6	8625
		ПС		823,1	35,3	981,0	35,7	2,8	6,4	1,61	10	18,2	8650
Непідпорядковані Мінвуглепрому				34127,0	37,4	37138,5	38,1	1,9	8,3	-	-	32,4	8136
у тому числі:													
енергетичне вугілля				19193,0	37,9	19964,8	37,2	1,9	9,8	-	-	32,7	7867
			ДГ	10914,3	39,0	12250,7	38,9	1,4	12,2	0,6	8	41,8	8135
			Г	3284,5	39,3	2443,1	32,5	2,6	8,3	0,7	11	39,6	5096
			П	4994,2	34,4	5271,0	35,5	2,8	4,9	2,5	0	8,3	8530
				14934,0	36,9	17173,7	39,1	2,0	6,7	-	-	32,0	8449
коксівне вугілля				567,4	32,8	53,3	33,2	1,2	10,2	0,6	9	39,6	8210
		ДГ		1402,5	34,3	3172,7	35,6	2,4	7,1	0,7	13	39,0	8355
		Г		6030,1	38,3	7657,7	39,5	2,3	6,5	0,9	22	33,1	8368
		Ж		6934,0	36,6	6290,0	40,5	1,3	6,7	1,2	18	27,0	8597
		К		34127,0	37,4	37138,5	38,1	1,9	8,3	-	-	32,4	8136

Найменування шахти	Дольова участь пластів у видобутку вугілля по шахті у 2010 році, %	Марка вугілля ДСТУ 3472-96		Фактичний видобуток рядового вугілля у 2009 році		Видобуток рядового вугілля, що планується у 2010 році				Класифікаційні параметри			
		кокс.	енерг.	тис. т	Зольність A^d, %	тис. т	Зольність A^d, %	Сірка S^d_t, %	Волога W^r_t, %	Середній показник відбиття вітриніту R_o, %	Товщина пластичного шару Y, мм	Вихід летких речовин на сухий стан V^{daf}, %	Вища теплота згорання Q_s^{daf}, ккал/кг
Донецька область				32159,6	38,1	32038,5	38,3	2,2	6,9	-	-	25,6	8389
у тому числі													
Підпорядковані Мінвуглепрому				17919,6	40,0	18344,0	39,9	2,4	7,1	-	-	27,6	8307
Непідпорядковані Мінвуглепрому				14240,0	35,6	13694,5	36,2	2,0	6,6	-	-	22,9	8499
у тому числі:													
енергетичне вугілля				16921,1	39,5	18025,0	38,7	2,4	6,6	-	-	22,3	8294
			Д	273,2	49,0	200,0	42,1	2,4	13,5	0,57	0	39,5	7487
			ДГ	1460,3	44,7	1575,0	41,8	2,6	8,7	0,63	8	41,2	8017
			Г	6431,7	42,1	6906,0	40,1	2,5	7,3	0,80	12	37,8	8194
			П	7074,8	35,1	7458,0	36,3	2,7	5,4	2,44	0	8,4	8519
			А	1681,1	42,3	1886,0	40,2	1,0	6,6	4,17	0	3,5	8091
коксівне вугілля				15238,5	36,4	14013,5	37,9	2,0	7,2	-	-	29,7	8511
		Г		2037,5	35,1	1985,8	36,6	2,5	6,8	0,79	17	35,3	8408
		Ж		4497,7	34,6	4757,7	36,2	2,4	7,4	0,99	21	33,6	8476
		К		7944,3	37,9	6394,0	39,7	1,4	7,2	1,20	17	26,7	8551
		ПС		759,0	35,9	876,0	36,5	2,7	6,3	1,58	10	18,4	8643
Луганська область				23401,7	38,8	25802,0	39,3	2,1	6,9	-	-	17,6	7873
у тому числі													
Підпорядковані Мінвуглепрому України				17246,7	38,3	17502,0	38,4	1,9	7,3	-	-	11,1	8062
Непідпорядковані Мінвуглепрому України				6155,0	40,4	8300,0	41,1	2,5	6,0	-	-	31,3	7473

Найменування шахти	Дольова участь пластів у видобутку вугілля по шахті у 2010 році, %	[illegible]		[illegible]		[illegible]				[illegible]			
		кокс.	[illegible]	тис. т	[illegible]	тис. т	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
у тому числі:													
енергетичне вугілля				17960,6	38,4	18347,0	38,1	1,9	7,4	-	-	12,7	7641
			ДГ	812,5	43,1	1040,0	42,5	3,0	12,0	0,56	8	41,8	7792
			Г	2747,3	44,1	3262,0	40,1	3,7	9,2	0,66	11	40,7	5690
			П	731,3	36,7	845,0	36,7	3,3	6,7	2,36	0	9,0	8531
			А	13669,5	37,1	13200,0	37,3	1,4	6,6	4,61	0	3,7	8055
коксівне вугілля				5441,1	40,2	7455,0	42,2	2,4	5,6	-	-	29,7	8443
		Ж		3890,4	40,8	5050,0	41,7	2,3	5,8	0,93	22	32,4	8295
		К		1486,6	39,2	2300,0	43,9	2,4	5,2	1,29	22	24,4	8755
		ПС		64,1	29,2	105,0	29,3	3,6	7,6	1,81	8	17,0	8705
Дніпропетровська область				13732,0	38,0	15144,0	38,2	1,6	11,2	-	-	41,5	8172
у тому числі													
енергетичне вугілля				12347,1	38,5	12543,8	38,8	1,5	12,1	-	-	41,7	8140
			ДГ	10914,3	39,0	12250,7	38,9	1,4	12,2	0,57	8	41,8	8135
			Г	1432,8	34,4	293,1	33,0	2,1	7,9	0,75	10	40,1	8334
коксівне вугілля				1384,9	33,8	2600,2	35,5	2,0	7,0	-	-	40,6	8326
		Г		567,4	32,8	53,3	33,2	1,2	10,2	0,61	9	39,6	8210
		ДГ		817,5	34,5	2546,9	35,6	2,0	7,0	0,75	11	40,6	8329
Волинська область													
енергетичне вугілля			ДГ	476,0	38,2	590,0	37,2	2,1	9,3	0,64	7	37,1	7857
Львівська область													
енергетичне вугілля				2753,2	45,0	2630,0	47,6	2,3	5,8	-	-	36,7	8348
			Г	2318,1	46,8	2314,0	48,3	2,2	6,1	0,9	14	36,8	8345
			Ж	435,1	35,3	316,0	43,0	3,3	4,0	0,9	21	36,1	8365

Table 28. Coal extraction in mines and stripe mines 2008

І ВИДОБУТОК ВУГІЛЛЯ ШАХТАМИ ТА РОЗРІЗАМИ

Найменування шахти	Дольова участь пластів у видобутку вугілля по шахті у 2007 році, %	Марка вугілля ДСТУ 3472-96		Фактичний видобуток рядового вугілля у 2007 році		Видобуток рядового вугілля, що планується у 2008 році				Класифікаційні параметри			
		кокс.	енерг.	тис. т	Зольність A^d, %	тис. т	Зольність A^d, %	Сірка S^d_t, %	Волога W^r_t, %	Середній показник відбиття вітриніту R_o, %	Товщина пластичного шару Y, мм	Вихід летких речовин на сухий стан V^{daf}, %	Вища теплота згорання Q_s^{daf}, ккал/кг
МІНВУГЛЕПРОМ УКРАЇНИ				75095,4	38,1	78343,6	38,4	2,1	8,0	-	-	28,1	8243
у тому числі													
Підпорядковані Мінвуглепрому				42152,3	40,1	46000,0	39,2	2,2	7,1	-	-	24,0	8195
Непідпорядковані Мінвуглепрому				32943,1	35,5	32343,6	37,2	2,1	9,4	-	-	33,9	8311
у тому числі:													
енергетичне вугілля				49145,3	39,0	53103,0	38,6	2,1	8,6	-	-	25,8	8153
			Д	270,2	48,9	365,0	40,5	2,4	13,0	0,50	0	41,2	7700
			ДГ	8241,5	41,6	8465,0	40,1	1,9	11,2	0,61	8	42,6	8011
			Г	16608,8	41,8	18780,0	41,8	2,6	8,4	0,76	10	40,7	8176
			Ж	290,5	28,6	165,0	33,5	2,9	5,4	0,87	23	36,0	8377
			П	7012,4	34,5	7183,0	34,4	2,7	5,6	2,40	0	10,1	8543
			А	16502,5	37,0	17290,0	36,8	1,3	6,5	4,10	0	5,6	8088
			Б	219,4	24,9	855,0	24,5	3,8	55,6	0,35	0	60,6	6999
коксівне вугілля				25950,1	36,3	25240,6	37,9	2,2	6,7	-	-	33,0	8449
		Г		3228,4	35,4	3600,0	36,3	1,6	7,5	0,72	12	40,9	8386
		Ж		11878,0	35,5	12657,6	37,3	2,8	6,5	0,93	25	35,0	8480
		К		10141,9	37,5	8103,0	39,6	1,5	6,8	1,24	19	27,8	8400
		ПС		701,8	38,6	880,0	36,3	3,0	6,8	1,65	10	20,0	8613

Найменування шахти	Дольова участь пластів у видобутку вугілля по шахті у 2007 році, %	Марка вугілля ДСТУ 3472-96		Фактичний видобуток рядового вугілля у 2007 році		Видобуток рядового вугілля, що планується у 2008 році				Класифікаційні параметри			
		кокс	енерг.	тис. т	Зольність A^d, %	тис. т	Зольність A^d, %	Сірка S^d_t, %	Волога W^r_t, %	Середній показник відбиття вітриніту R_o, %	Товщина пластичного шару Y, мм	Вихід летких речовин на сухий стан V^{daf}, %	Вища теплота згорання Q_s^{daf}, ккал/кг
Донецька область				33790,3	38,6	34598,6	38,2	2,3	7,0	-	-	28,5	8341
у тому числі													
Підпорядковані Мінвуглепрому				19249,1	42,1	22270,0	39,8	2,4	7,1	-	-	31,1	8292
Непідпорядковані Мінвуглепрому				14541,2	34,1	12328,6	35,3	2,1	6,8	-	-	24,0	8430
у тому числі.													
енергетичне вугілля				16282,4	40,4	19033,0	38,8	2,4	6,9	-	-	26,1	8280
			Д	270,2	48,9	365,0	40,5	2,4	13,0	0,50	0	41,2	7700
			ДГ	2088,3	48,5	2265,0	41,9	2,2	8,9	0,69	8	41,6	7950
			Г	5758,2	41,7	7760,0	40,7	2,7	7,4	0,85	13	39,9	8221
			П	6302,3	35,1	6403,0	34,7	2,6	5,6	2,42	0	10,0	8540
			А	1863,4	43,9	2240,0	40,6	1,0	6,3	3,73	0	6,5	8172
коксівне вугілля				17507,9	37,0	15565,6	37,5	2,1	7,1	-	-	31,5	8416
		Г		657,0	37,2	870,0	35,0	1,2	6,0	0,92	12	39,0	8365
		Ж		7133,9	36,6	6867,6	36,0	2,8	7,3	0,99	25	35,3	8457
		К		9064,9	37,1	7003,0	39,3	1,5	7,0	1,24	17	28,2	8360
		ПС		652,1	39,0	825,0	36,4	3,0	6,7	1,66	10	20,2	8607
Луганська область				25208,7	36,7	27075,0	37,7	2,1	6,8	-	-	18,6	8192
у тому числі													
Підпорядковані Мінвуглепрому України				19387,6	37,1	20185,0	37,2	1,9	7,2	-	-	13,7	8075
Непідпорядковані Мінвуглепрому України				5821,1	35,0	6890,0	39,3	2,6	5,5	-	-	33,1	8531

Annex 5

REFERENCE OF THE STATE STATISTICS SERVICE OF UKRAINE "ACTUAL EXPENSES OF ELECTRICITY FOR PRODUCTION OF ONE TON OF NON-AGGLOMERATED COAL"[71]

ДЕРЖАВНА СЛУЖБА СТАТИСТИКИ УКРАЇНИ
(Держстат України)

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

29.05.2012р. № 15/1-20/692ПІ На № від

Товариство з обмеженою відповідальністю
«Науково-дослідний центр КТФ»

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

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

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

кВт.г/т

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

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

Заступник Голови Н.С. Власенко

Вик. Смаляна В.П.,
тел.287-36-81

- - - - -

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

Annex 6

ADDITIONAL INFORMATION ON PROJECT PARTICIPANTS

Organization:	"RIGHT" LLC
Country of registration:	Ukraine
EDRPOU code (Uniform State Register of Enterprises and Organizations of Ukraine):	30399835
KVED types of economic activities (Code of economic activities according to the general classification of economic activities)	the first is the main: 46.71 - Wholesale of solid, liquid and gaseous fuels and related products 38.32 - Recovery of sorted materials 46.90 - Non-specialised wholesale trade 47.78 - Other retail sale of new goods in specialised stores 68.20 - Renting and operating of own or leased real estate

Organization:	OHANA LLP
Country of registration:	Great Britain
Data of registration:	24/06/2003

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