JOINT IMPLEMENTATION PROJECT DESIGN DOCUMENT FORM
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Annexes

SECTION A. General description of the project

A.1. Title of the project:

Waste Heaps Dismantling in Luhansk Region of Ukraine by "FPG "SKHID-ZAKHID" with the Aim of Decreasing the Greenhouse Gases Emissions into the Atmosphere.

Sectoral scope: 8. Mining/mineral production

Version of the document: 4.0

Date of the document: 31 May, 2012.

A.2. Description of the project:

The proposed project *"Waste Heaps Dismantling in Luhansk Region of Ukraine by "FPG "SKHID-ZAKHID" with the Aim of Decreasing the Greenhouse Gases Emissions into the Atmosphere"* is a progressive project that envisages processing and dismantling the waste heaps at the sites of the former Mine #3-80 GP "Rovenkiantracite" OP "Mine named after M.V. Frunze" and former Mine #31-32, which are located in urban village Yasenovskiy of town Rovenki, Luhansk Region, Ukraine.

Ukraine is the largest coal mining country in Europe and is among top eight in the world. The centre of coal mining in Ukraine is Donbas, an area located in the eastern part of Ukraine and spreading from the North of Donetsk region to the South of Luhansk region. The coal mining industry is one of the major polluters of the environment in Ukraine. The damage to ecology during the process of coal extraction is caused presumably by corruption of the underground layers, formation of huge spoil areas for waste rock storage, and uncontrolled combustion of coal in the waste heaps.

The main idea of the project is to process waste heaps originated due to coal extraction from mines. This activity will prevent significant amount of greenhouse gas emissions into the atmosphere, generate considerable amount of coal by use of technology different from mining, and rehabilitate spoiled land to make it suitable for further utilization and afforestation.

The Project activities include installation of the coal extraction facilities near the waste heaps and application of special machinery that will perform preparation, loading and transportation of the rock mass from the waste heaps to the beneficiation factory. After beneficiation procedure, the extracted coal will be sold for heat and power generation, and the remaining bare rock will be stored in a reshaped waste heap with possibility of utilization for land engineering and road building.

Situation existing prior to the project implementation

The common practice of coal mining in Ukraine is application of underground method when the main shaft serves for connection of the underground facilities with the surface; and coal layers are processed at different horizons, which often are very deep. For instance, the deepest coal mine in Ukraine is Shakhterskaya-Glubokaya (1546 meters below the sea level). All the existing methods of underground coal mining result in creation of huge underground hallows, and waste heaps on the ground surface.

According to different estimates the rock, which is being extracted in the mines, contains up to 65-70% of coal, the rest is barren rock. On-site separation facilities are implemented at the mine to separate coal from the barren rock. However, due to low efficiency of the coal mine separation equipment, not all coal is extracted from the rock, thus the residue substance left after extraction is stored in the waste heaps.

Annually, Ukrainian coal mining industry brings to the surface about 40 million cubic meters of rock. After two hundred years of coal mining, 1184 waste heaps have been formed (as of 01.01.2007), and they occupy around 10 thousand ha of fertile land, suitable for agriculture, and industrial and residential building. Moreover, the coal contained in the waste heap is, in the course of time, vulnerable to spontaneous ignition and slow combustion. According to specialists' research, percentage of combustible material (or coal) in waste heaps can range from 7% to 28-32%[1].

Waste heaps that are burning or are close to spontaneous ignition are the sources of uncontrolled greenhouse gas and hazardous substance emissions. On average, one burning waste heap produces around 10 tonnes of carbon oxides, 1.5 tonnes of sulphur dioxide and a significant amount of impurities and other gases per day[2]. Despite the dangers caused by the burning of the waste heaps, there is little incentive for their owners to extinguish the fires immediately and put any solution to the issue of uncontrolled environmental pollution because of high cost of such activities.

Before the project implementation, the waste heaps included in the project scenario were not processed or subjected to fire preventive maintenance, thus there existed a possibility of their burning and subsequent emission of greenhouse gases into the atmosphere.

Baseline Scenario

The baseline scenario is considered to be a continuation of a common practice of coal mining in Ukraine. The coal is being extracted from the underground deposits, which results in formation of waste heaps consisting of rock matter and combustible coal fraction. It is assumed that coal contained in the waste heaps is not a subject of extraction and; as a result, there is a high possibility of spontaneous self-heating and subsequent burning of waste heaps. Additionally, since the waste heaps are not processed, the coal for heat and energy needs is being extracted in the coal mines causing fugitive methane emissions.

Project Scenario

In the project scenario the coal extracted from the waste heaps will partly replace the coal that would have been mined instead. Under the project scenario, the installed equipment will enable to extract the residual coal from the waste heaps and use it for the energy needs of local consumers. These activities would eliminate greenhouse gas emissions caused by waste heap burning. Secondly, since the coal extraction from the waste heaps replaces coal mining, the fugitive emissions of methane would be reduced as well.

Figure 1. One of the waste heaps to be processed by the beneficiation plant during the project period

The waste heaps envisaged for processing were formed by presently closed coal mines Mine #3-80 GP "Rovenkiantracite" OP "Mine named after M.V. Frunze" and Mine #31-32.

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

[2] http://www.uaenergy.com.ua/c225758200614cc9/0/98c5a51b4f451721c22577cf00486af4

The Project envisages carrying out a number of works on coal beneficiation for high-grade anthracite production. The main stages are:

- Building of the beneficiation plant at the territory of the former mine Mine #3-80 for the purpose of processing four existing not burnt waste heaps (# 1, 2, 3, 5);
- Preparation of the waste heaps to ensure continuous supply of the rock to the beneficiation plant;
- Beneficiation of coal aimed at production of high-quality coal of sort "A" (anthracite);
- Utilizing the discharge substance to form new flat multi-tiered heaps suitable for further recultivation.

The project activity is very important for the region because it not only removes negative effect of waste heap burning but also provides additional work places for the population, transforms waste lands under the heaps into lands appropriate for recultivation, building, afforestation etc.

The benefits provided by the JI mechanism were crucial in the decision to implement the project. Decision on the project implementation was taken on the 12th of May 2008. Project and construction period lasted from January 2009 to March 2011. Operation of the plant started on the 1st of April 2011.

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)	• "FPG "SKHID-ZAKHID" LLC	No
The Netherlands	• Global Carbon B.V.	No

"FPG "SKHID-ZAKHID" LLC is the project host. Global Carbon B.V. is the developer of this JI project and a prospective buyer of the emission reduction units generated under the project.

A.4. Technical description of the project:

A.4.1. Location of the project:

A.4.1.1. Host Party(ies):

Ukraine

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

Luhansk Region

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

Urban village Yasenovskiy of town Rovenki

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

The physical location of the project is at the industrial site of the at the industrial sites of the former Mine #3-80 GP "Rovenkiantracite" OP "Mine named after M.V. Frunze" and former Mine #31-32 which are located in urban village Yasenovskiy of town Rovenki, Luhansk Region, Ukraine.

Figure 2. Map of Ukraine and location of Rovenki, Luhansk region

The town of Rovenki is located to the south of the regional center Luhansk. Rovenki is the town of regional subordination and includes 10 urban villages, one of them is Yasenovskiy, where all the waste heaps within the project boundary are located. Population of Rovenki is approximately 87 000 citizens, among them 83 800 are urban community and 3 200 are rural community. Main business in the area is coal mining; however, at present many mines are closed or have low production, leaving the population without work.

Figure 3. Location of the project site

Geographical coordinates of the project site are 48° 0.9' 38.90" N and 39° 15' 18.37" E

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

The coal beneficiation factory is located in urban village Yasenovskiy of town Rovenki, where all processing waste heaps are located. Characteristics of the waste heaps to be processed are provided below:

Table 2. Characteristics of the waste heaps within the project boundaries

Waste heap	Fraction, mm	Volume, t	Ash content, %
No 1 of mine #3-80	0-150	1 514 050	85.0
No 2 of mine #3-80	0-150	528 525	85.0
No 3 of mine #3-80	0-150	212 805	85.0
No 5 of mine #31-32	0-150	1 146 360	85.0
Total	**0-150**	**3 401 740**	**85.0**

The beneficiation complex consists of next facilities: beneficiation plant, stationary sorting complex with equipment for processing of the ordinary anthracite of 0-40 mm, mobile sorting unit, bunker, gallery, feeding house, storage areas for coal and rock substance, wastewater treatment facilities, pumping station, administrative buildings, garages and vehicle parking lots. Total area allotted for the construction of the complex equals to 4.5367 ha.

Project capacity of the complex allows processing 80 000 tonnes of rock substance per one month in order to produce high quality coal concentrate. Technological scheme for processing of rock mass to extract coal can be presented as follows:

- Reception of rock mass and its storage: Rock substance is being transported from the waste heaps to the storage by trucks KAMAZ 5511;
- Rock mass processing: Supplied rock mass is sorted into +40 mm and -40 mm grades at the cribble. Grades +40 mm are sorted out manually; 0-40 mm grades are desludged and supplied to the mixer where mixed with water and magnetite to obtain pulp.
- Production of coal: The obtained pulp is supplied to the hydrocyclone where separated into bare rock and coal concentrate. Sludge is supplied to separation equipment where separated into coal concentrate and bare sludge.
- Separation of coal: The coal concentrate is dried and separated into 1-6 mm, 6-13 mm and 13-40 mm products. The sludge beneficiation produces 0.1-1 mm product.
- Coal storage: Coal products of different grades are stored separately.
- Waste treatment. Magnetite is washed off from the bare rock and recycled for coal beneficiation. Bare rock is transferred to the reshaped waste heap. Bare sludge is separated into bare rock and waste water. Waste water is regenerated and recycled in the beneficiation complex.

Detailed technological scheme of anthracite of fraction 0-40 mm extraction:
Rock mass is loaded into the bunker, and then directed by the feeder to Cribble #1 which separates the substance into 0-40 mm grade and +40 mm grade. The product +40 mm is sent to a manual coal extraction and afterwards to the waste heap. The product 0-40 mm class is mixed with water and transported to Cribble #2, where separation of sludge of class 0-1.0 mm is being carried out.

The desludged material is supplied to the mixer to be mixed with the magnetite suspension. The obtained pulp is pumped from the mixer to the hydrocyclone which separates the rock mass into the heavy (bare rock) and light (coal concentrate) fractions.

The coal concentrate fraction is directed to the arc sieve and then to Cribble #3. At this stage the water suspension is separated and supplied to the regenerator; the magnetite is washed away from the beneficiation products; the products are dehydrated and sorted into 1.0-6 mm and 6-40 mm classes.

Washed and dehydrated concentrate of 6-40 mm class is sent to Cribble #4 for classification into sorts 6-13 mm and 13-40 mm. Concentrates of 0.25-1.0 mm and 1.0-6 mm classes are directed for the final dehydration in a centrifuge. Beneficiated products are transported to the storage.

The rock fraction from hydrocyclone is washed from magnetite, dehydrated and sent to a heap. Washout water containing magnetite is directed to magnetic separators for regeneration.

The sludge obtained during the beneficiation process undergoes gradual separation into concentrate, magnetite, water and waste products by use of magnetic separators, spiral separators, hydrocyclones, centrifuge, cribbles and sieves.

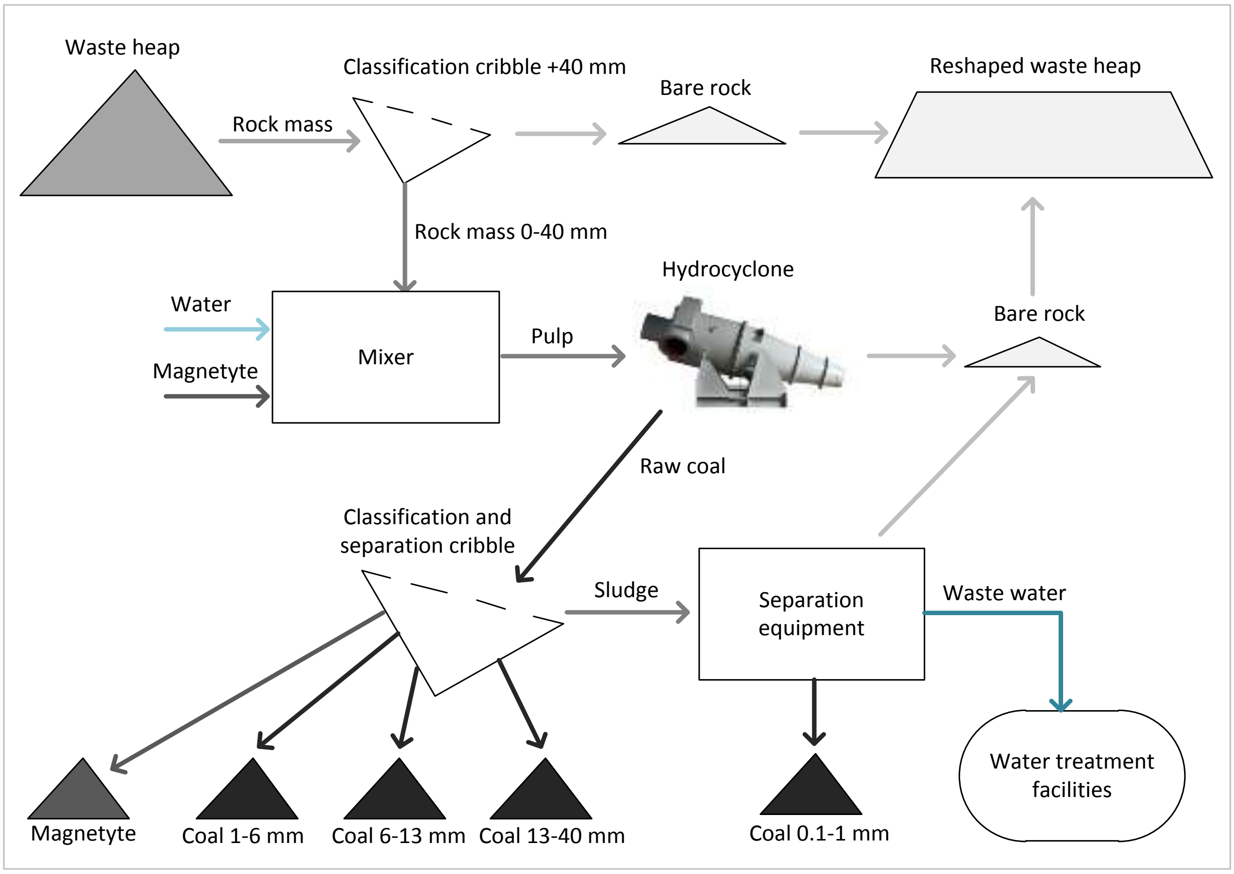

Figure 4 Simplified flowchart of a coal extraction process at the plant

Generally, the coal beneficiation plant is a four-floored construction which includes such equipment as separators, thickeners, hydrocyclones, cribbles, bend conveyors, pumps, feeders, sieves, centrifuges, tanks, sump basins and other facilities. The equipment is interconnected by wiring and pipeline. The beneficiation process is controlled from the control room.

The key equipment used for coal beneficiation at the plant is listed below:

- Two-product hydrocyclone GT-710MPK manufactured by Ukrugleperspektiva company;
- Inertial cribble GIST 41S manufactured by Mashstroyidnustria company;
- Cribble GVCH 42-11 manufactured by Mashstroyidnustria company;
- Belt conveyer KL 6000x15000-U manufactured by the plant named after Petrovskiy, Donetsk;
- Pump GRAT 350/40 manufactured by Bobruisk Machine Building Plant;
- Sepatator EBM-90/250 manufactured by Mashstroyidnustria company.

The activities implemented within the project reflect current good practice: the installed equipment is modern and efficient; it maintains continuous and accurate process of coal beneficiation. However since the working conditions of the equipment are hard, it can be replaced by analogues if damaged or worn-out.

Hereby the beneficiation plant processes waste heaps with precise separation of the material into bare rock mass and qualitative anthracite coal suitable for further utilization for heat and energy purposes. The rock mass is stored into heaps and can be used for different purposes: construction of dams; filling of open pits and deep basins of river channels and reservoirs; earthworks and road construction.

Technological process is environmentally sound and does not require any use of hazardous materials. Construction decision was taken in May 2008. Project development, purchase of equipment, construction and mounting works, and commissioning works were held from January 2009 to March 2011. On 30 March, 2011 the order for put into operation of the plant has been issued. On its basis, since April 1 2011 the beneficiation complex has been extracting anthracite coal and contributing to reduction of greenhouse gas emissions into the atmosphere.

Table 3. Schedule of the project implementation

Milestones of the JI Project	Start date	End date
Decision making	May 2008	
Projecting, installation, and commissioning of equipment	January 2009	March 2011
Operation of the project	1 April 2011	31 March 2026

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

The proposed project envisages extraction of coal from non-burnt waste heaps. Emission reductions due to the implementation of this activity will come from two major sources:

- Removing the source of greenhouse gas emissions from the combustion of waste heaps by the extraction of coal from the waste heaps;
- Negative leakage through reduced fugitive emissions of methane due to the replacement of coal that would have been mined, by coal extracted during the project activities.

Although efforts to stop burning of waste heaps and break them down are completely in line with the existing environmental legislation of Ukraine, the solution of these problems is rather costly requires significant efforts and, actually, is not addressed in a systematic way in Ukraine. The main reason is deficiency of necessary financial resources and lack of political will. The situation is deteriorated by the fact that coal mining itself has decreased over the last 10-12 years as a result of the lack of financing and high net cost of coal extraction.

Given that, national and sectoral policies and circumstances in coal sector will unlikely result in emission reductions in the absence of the proposed project in the upcoming periods. Detailed description on the baseline setting can be found in Section B of this PDD.

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

Table 4. Estimated amount of emission reductions over 2011-2012

	Years
Length of the crediting period	2
Year	Estimate of annual emission reductions in tonnes of CO_2 equivalent
Year 2011	232 332
Year 2012	309 777
Total estimated emission reductions over the crediting period (tonnes of CO_2 equivalent)	**542 109**
Annual average of estimated emission reductions over the crediting period (tonnes of CO_2 equivalent)	271 055

Table 5. Estimated amount of emission reductions over 2013-2026

	Years
Length of the crediting period	14
Year	Estimate of annual emission reductions in tonnes of CO_2 equivalent
Year 2013	309 777
Year 2014	309 777
Year 2015	309 777
Year 2016	309 777
Year 2017	309 777
Year 2018	309 777
Year 2019	309 777
Year 2020	309 777
Year 2021	309 777
Year 2022	309 777
Year 2023	309 777
Year 2024	309 777
Year 2025	309 777
Year 2026	77 443
Total estimated emission reductions over the crediting period (tonnes of CO_2 equivalent)	**4 104 544**
Annual average of estimated emission reductions over the crediting period (tonnes of CO_2 equivalent)	293 182

A.5. Project approval by the Parties involved:

The Ukrainian designated focal point which is the State Environmental Investment Agency of Ukraine has granted a Letter of Endorsement #3539/23/7 for the project on 1 December, 2011. With regard to the Netherlands' legislation, no LoE from the Netherlands is needed.

After AIE has completed the determination report, the PDD and the Determination Report will be presented to the State Environmental Investment Agency of Ukraine to obtain a Letter of Approval from Ukraine. Letter of Approval with the number 2011JI44 was issued by the DFP of the Netherlands on 20 January 2012.

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)[3], 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 03)[4] (hereinafter referred to as Guidance), the baseline for a JI project is the scenario that reasonably represents the anthropogenic emissions by sources or anthropogenic removals by sinks of GHGs that would **occur in the absence of the proposed project**.

In accordance with the Paragraph 9 of the Guidance the project participants may select either: an approach for baseline setting and monitoring developed in accordance with appendix B of the JI guidelines (JI specific approach); or a methodology for baseline setting and monitoring approved by the Executive Board of the Clean Development Mechanism (CDM), including methodologies for small-scale project activities, as appropriate, in accordance with paragraph 4(a) of decision 10/CMP.1, as well as methodologies for afforestation/reforestation project activities. Paragraph 11 of the Guidance allows project participants that select a JI specific approach to use selected elements or combinations of approved CDM baseline and monitoring methodologies or approved CDM methodological tools, as appropriate.

Description and justification of the baseline chosen is provided below in accordance with the "Guidelines for users of the Joint Implementation Project Design Document Form", version 04[5], using the following step-wise approach:

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

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

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

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

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

The most plausible future scenario will be identified by performing a barrier analysis. Should only two alternatives remain, of which one alternative to represent the project scenario with the JI incentive, the additionality will 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. Key factors that affect the baseline such as sectoral reform policies and legislation, economic situation/growth and socio-demographic factors as well as decreasing and/or increasing demand to be met by the project, availability of capital, technologies/techniques, skills and know-how, availability of best available technologies/techniques in the future, fluctuations in fuel prices, national and/or subnational expansion plans for the energy sector will be taken into account while formulating the plausible feature scenarios.

[3] http://unfccc.int/resource/docs/2005/cmp1/eng/08a02.pdf#page=2

[4] http://ji.unfccc.int/Ref/Documents/Baseline_setting_and_monitoring.pdf

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

Step 2. Application of the approach chosen

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

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

Scenario 1. Continuation of existing situation

In the current situation waste heaps are not utilised. Coal contained in the waste heaps is not a subject of extraction and; as a result, spontaneous self-heating and subsequent burning of waste heaps leading to uncontrolled GHG emissions is very common. Coal is produced by underground mines that causes fugitive emissions of methane as well as the formation of new waste heaps.

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

Waste heaps are not extinguished and not monitored properly. Some burning heaps are used to produce energy by direct insertion of heat exchangers into the waste heap[6]. This captures a certain amount of heat energy for direct use or conversion into electricity. Coal for industrial use is not extracted from the waste heaps under this scenario. 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.

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[7]. 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.

Scenario 4. Coal extraction from waste heaps without JI incentives

Although this scenario is similar to the project activity only, the project itself does not benefit from the possible development as a joint implementation project. In this scenario waste heaps are processed in order to extract coal and use it in the energy sector. 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. Coal is not extracted from the waste heaps, but is produced by underground mines and used for energy production or other purposes. Mining activities result in fugitive gas release and formation of more waste heaps.

[6] *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://masters.donntu.edu.ua/2004/fgtu/zayanchukovskaya/library/artcl3.htm)

[7] *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, Luhansk, #1 2007

Sub step 2b. Barrier analysis

Scenario 1. Continuation of existing situation

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

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

Technological barrier: This scenario is based on highly experimental technology, which has not been implemented even in a pilot project. It is also not suitable for all waste heaps as the project owner will have to balance the energy resource availability (i.e. waste heap location) and the location of the energy user. On-site generation of electricity also requires additional interconnection engineering. In general, this technology has yet to prove its viability. In addition, it does not allow controlling and management of emitted gases.

Investment barrier: Investment into unproven technology results in a high risk. In Ukraine, ranked as a high-risk country, investment into such kind of energy projects is unlikely to attract investors. The pioneering character of the project may require the development of the programmes and governmental incentives and 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 project owner to be able to produce quality materials. 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.

Scenario 4. Coal extraction from waste heaps without JI incentives

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[8].

[8] http://www.imcmontan.ru/team/publication/coal.pdf

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 owners, such as mines or regional coal mining associations[9]. However, 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.[10] 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 by this scenario.

Sub step 2c. Baseline identification

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

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

1) On a project specific basis and using the multi-project carbon emission factor for fugitive methane emissions from coal mining;
2) In a transparent manner with regard to the choice of approaches, assumptions, methodologies, parameters, data sources and key factors. All parameters and data are either monitored by the project participants or are taken from sources that provide a verifiable reference for each parameter. Project participants use approaches suggested by the Guidance and methodological tools provided by the CDM Executive Board;
3) Taking into account relevant national and/or sectoral policies and circumstances, local fuel availability, power sector expansion plans, and the economic situation in the coal sector. Given current situation of Donbas coal sector the above analysis demonstrated that the baseline chosen clearly represents the most probable future scenario;
4) In such a way that emission reduction units (ERUs) cannot be earned for decreases in activity levels outside the project activity or due to force majeure. According to the proposed approach 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.
5) 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. The approaches used for the calculation of emission levels in the National Inventory Reports (NIRs) of Ukraine are used to calculate baseline and project emissions when possible. NIRs use 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.

Baseline Emissions

In order to calculate baseline emissions following assumptions were made:

1) The project will produce energy coal 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;

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

[10] *Coal Sector of Ukraine: Problems and Sustainable Development Perspectives*, Yuri Makogon, National Institute For Strategic Research, 2008 (http://www.niss.gov.ua/Monitor/desember08/5.htm)

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) Waste heaps of the region are vulnerable to spontaneous self-heating and burning and at some point in time will burn;
5) The waste heaps that the project is dismantling are categorized as being at risk of ignition. This means that they will self-heat and start burning under normal circumstances. Coal burning in the waste heaps will oxidize to CO_2 completely if allowed to burn uncontrolled;
6) The processed rock is not vulnerable to self-heating and spontaneous ignition after the coal has been removed during the processing;
7) 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.

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*
NCV_{Coal}	TJ/kt	Net calorific value of coal	National Inventory Report of Ukraine 1990-2009[11], p. 399 (value for stationary combustion, power and heat production, 2009)	21.8
$OXID_{Coal}$	ratio	Carbon oxidation factor of coal	National Inventory Report of Ukraine 1990-2009, p. 402 (value for stationary combustion, power and heat production, 2009)	0.963
k^{C}_{Coal}	t C/TJ	Carbon content of coal	National Inventory Report of Ukraine 1990-2009, p. 401 (value for stationary combustion, power and heat production, 2009)	25.97

Emissions in the baseline scenario are calculated as follows:

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

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

Where:

BE_y - Baseline Emissions in year *y*, (tCO_2e);

$BE_{WHB,y}$ - Baseline Emissions due to burning of the waste heaps in year *y*, (tCO_2e).

These, in turn, are calculated as:

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

Where:

$FC_{BE,Coal,y}$ - Amount of coal that has been mined in the baseline scenario and combusted for energy use, equivalent to the amount of coal extracted from the waste heaps in the project activity in year *y*, (t);

p_{WHB} - Correction factor for the uncertainty of the waste heap 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. This number is taken from the study[12] of waste heaps in Luhansk region and is defined as the ratio of waste heaps that are or have been on fire historically to all existing waste heaps of Luhansk region. This ratio is equal to 0.699 according to this study, (ratio);

NCV_{Coal} Net calorific value of coal, (TJ/kt);

$OXID_{Coal}$ Carbon Oxidation factor of coal, (ratio);

k_{Coal}^{C} Carbon content of coal, (tC/TJ);

$44/12$ Ratio between molecular mass of CO_2 and C. Reflects oxidation of C to CO_2.

Leakage

Leakage is the net change of anthropogenic emissions by sources and/or removals by sinks of GHGs which occurs 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 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). Source of the leakage is **the fugitive methane emissions** due to coal mining. These emissions are specific to the coal that is being mined. Coal produced by the project activity is not mined but extracted from the waste heap through the advanced beneficiation process. Therefore, coal produced by the project activity substitutes the coal would have been otherwise mined in the baseline. Coal that is mined in the baseline has fugitive methane emissions associated with it and the coal produced by the project activity does not have such emissions associated with it.

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

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

This leakage is measurable: through the same procedure as used in 2006 IPCC Guidelines[13] (See Volume 2, Chapter 4, Page 4-11) and also used in CDM approved methodology ACM009[14] (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[15] 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 raw coal should be mined causing more fugitive methane emissions to produce equivalent amount of high quality coal concentrate.

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 following logic: Energy coal market is demand driven as it is not feasible to produce coal without demand for it. Coal is a commodity that can be freely transported to the source of demand and coal of identical quality can substitute some other coal easily. 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. Therefore, the coal supplied by the project in the project scenario will have to substitute the coal mined in the baseline scenario. According to this approach equivalent product supplied by the project activity (with lower associated specific greenhouse gas emissions) will substitute the baseline product (with higher associated specific greenhouse gas emissions). This methodological approach is very common and is applied in all renewable energy projects (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[16]), projects in metallurgy sector (e.g. UA1000181 Implementation of Arc Furnace Steelmaking Plant "Electrostal" at Kurakhovo, Donetsk Region[17]) and others.

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

Table 7. List of constants used in the calculations of leakage

Data / Parameter	***Data unit***	***Description***	***Data Source***	***Value***
GWP_{CH4}	$tCO_2e/ t\ CH_4$	Global warming potential of methane	IPCC Second Assessment Report[18]	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.	0.00067

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

14 http://cdm.unfccc.int/UserManagement/FileStorage/K4P3YG4TNQ5ECFNA8MBK2QSMR6HTEM

15 http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/5888.php

16 http://ji.unfccc.int/JI_Projects/DB/P1QYRYMBQCEQOT0HOQM60MBQ0HXNYU/Determination/Bureau%20Veritas%20Certification1266348915.6/viewDeterminationReport.html

17 http://ji.unfccc.int/JIITLProject/DB/4THB9WT0PK6F721UQA5H6PTHZEXT4C/details

18 "*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.

			Measurement units have been converted from $Gg \cdot m^{-3}$ to t/m^3. IPCC Standard (at temperature 20˚C and 101 325 Pa)	
$EF_{CH_4,CM}$	m^3/t	Emission factor for fugitive methane emissions from coal mining	National Inventory Report of Ukraine 1990-2009, p. 90	25.67

Leakages during the project activities in year y are calculated as follows:

$$LE_y = LE_{CH_4,y} \quad \text{(Equation 3)}$$

Where:

LE_y - Leakages in year *y*, (tCO_2e).

$LE_{CH_4,y}$ - Leakages due to fugitive emissions of methane in the mining activities in year *y*, (tCO_2e).

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

$$LE_{CH_4,y} = -FC_{BE,Coal,y} \cdot EF_{CH_4,CM} \cdot \rho_{CH_4} \cdot GWP_{CH_4} \quad \text{(Equation 4)}$$

Where:

$FC_{BE,Coal,y}$ - Amount of coal that has been mined in the baseline scenario and combusted for energy use, equivalent to the amount of coal extracted from the waste heaps in the project activity in year y, (t);

$EF_{CH_4,CM}$ Emission factor for fugitive methane emissions from coal mining, (m^3/t);

ρ_{CH4} Methane density, (t/m^3);

GWP_{CH4} Global Warming Potential of Methane, (tCO_2e/ t CH_4).

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

Table 8. List of data used to establish the baseline

Data/Parameter	$FC_{BE,Coal,y}$
Data unit	t
Description	Amount of coal that has been mined in the baseline scenario and combusted for energy use, equivalent to the amount of coal extracted from the waste heaps in the project activity in year *y*
Time of determination/monitoring	Yearly monitoring
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 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 the project owner policy
Any comment	No

Data/Parameter	p_{WHB}
Data unit	ratio
Description	Correction factor for the uncertainty of the waste heaps burning process
Time of determination/monitoring	Fixed ex ante
Source of data (to be) used	Scientific study
Value of data applied (for ex ante calculations/determinations)	0.699
Justification of the choice of data or description of measurement methods and procedures (to be) applied	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. This number is taken from the study of waste heaps in Luhansk region and is defined as the ratio of waste heaps that are or have been on fire historically to all existing waste heaps of Luhansk region. This ratio is equal to 0.699 according to this study
QA/QC procedures (to be) applied	Standard procedures are used.
Any comment	No

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

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

As suggested by Paragraph 44 (b) of the Annex 1 of the Guidance, 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.

Step 2. Application of the approach chosen

The following steps are taken in order to demonstrate additionality of this project:

Step 1: 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 to any that would otherwise occur

The project "Processing of waste heaps at Monolith-Ukraine" 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/JI_Projects/DB/IPT7L3CLGIZTGGX27T2101W7XCUCWW/Determination/DNV-CUK1315829182.27/viewDeterminationReport.html

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

1) Both projects propose **same GHG mitigation measure:** The proposed GHG mitigation measure under both projects is coal extraction from the mine's waste heaps. This will prevent greenhouse gas emissions into the atmosphere during combustion of the heaps and will contribute an additional amount of coal, without the need for mining.
2) Both projects are implemented within the **same geography and time**: The proposed project and identified comparable project are both located in Ukraine. Both projects were initiated in 2008.
3) Both projects have **similar scale**: Both projects are large scale JI projects. Both projects process waste heaps of comparable scale. The proposed project consists of one site that will operate during a certain period of time while the comparable project also consists of one site. Nominal capacity of the proposed project allows it to extract about 15 000 tonnes of coal concentrate per month and capacity of the comparable project allows it to extract about 11 000 tonnes of coal concentrate per month. The difference between the proposed project and the comparable project's is less than 50 per cent in terms of the projects' output. Both projects utilize similar technology**: i**n both projects the waste heap is dismantled using standard excavators and bulldozers. Trucks are used to move the waste heap matter to the processing facility. The processing facility in both projects is the coal beneficiation plant that utilizes gravity separation method to separate coal from the rest of the matter.
4) Since the proposed project and the comparable project were initiated in 2008, the **regulatory framework has not changed** in a manner that would affect the baseline of these projects.

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

Step 3: Provide justification why determination for a comparable project is relevant for the project at hand

The project "Processing of waste heaps at Monolith-Ukraine" and the proposed project are both implemented within the same geographic region of Ukraine – the Donbas coal mining region. The implementation timeline is quite similar. Both projects will share the same investment profile and market environment. These two 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[19] burdened by many problems. The market for the extracted coal will also be similar for both 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[20].

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.

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[19] http://www.necu.org.ua/wp-content/plugins/wp-download_monitor/download.php?id=126

[20] *Perspectives of energy coal sector development in Ukraine – it is time for reforms. The institute of economic researches and political consultations. German consultancy group. Berlin/Kyiv 2009.*

Table 9. International ratings of Ukraine[21]

Indicators	2008	Note
Corruption index of Transparency International	134 position from 180	Index of corruption
Rating of business practices of The World Bank (The Doing Business)	139 position from 178	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	54 position from 55	Research of competitiveness (state of economy, efficiency of government, business efficiency and state of infrastructure)
Index of Economic Freedom of Heritage Foundation	133 position from 157	Determination of degrees of freedom of economy (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	72 position from 134	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. The comparison of commercial lending rates in Ukraine and in Eurozone for the loans over 5 years in EUR is presented in a figure below:

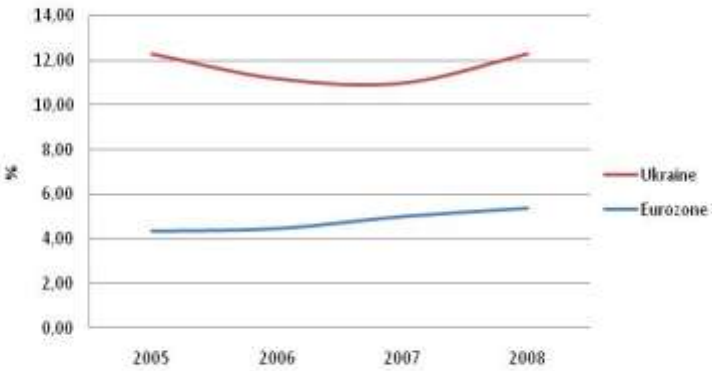

Figure 5. Commercial lending rates, EUR, over 5 years[22]

Cost of debt financing in Ukraine is at least twice as high as in the Eurozone. The risks of investing into Ukraine are additionally confirmed by the country ratings provided by the Moody's international rating agency and the associated country risk premium. The table below compares country risk premiums for Russia and Ukraine[23]:

Table 10. Risk premiums for Russia and Ukraine

Total Risk Premium, %	2003	2004	2005	2006	2007	2008	2009	2010
Russia	7.0	7.02	6.6	6.64	6.52	8	6.9	7.25
Ukraine	11.57	11.59	10.8	10.16	10.04	14.75	12.75	12.5

[21] Data by the State Agency of Ukraine for Investments and Innovations

[22] Data for Ukraine from National Bank of Ukraine http://www.bank.gov.ua/files/4-Financial_markets(4.1).xls

[23] Data from Aswath Damodaran, Ph.D., Stern School of Business NYU http://pages.stern.nyu.edu/~adamodar/

As it is demonstrated by this table, Russia, while offering a comparable set of investment opportunities, is a significantly less risky country for investing in than Ukraine.

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 but still contain unsatisfactory elements and pose a risk for foreign investors[24]. 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.

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.

Taking into account the information provided above it is possible to conclude that the determination of the project “Processing of waste heaps at Monolith-Ukraine” is relevant for the project at hand.

Outcome of the analysis: We have provided traceable and transparent information that an accredited independent entity has already positively determined that a comparable project “Processing of waste heaps at Monolith-Ukraine” (ITL Project ID: UA2000034) implemented under comparable circumstances (same GHG mitigation measure, same country, similar technology, similar scale) 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 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 in the legal use of “FPG “SKHID-ZAKHID”. At the same time, some sources of GHG emissions are indirect – fugitive methane emissions as the result of coal mining in Ukraine, carbon dioxide emissions due to the consumption of power from the Ukrainian electricity grid, as a result of electricity generation using fossil fuels. Fugitive methane emissions as the result of coal mining in Ukraine are treated as leakage.

The table below shows an overview of all emission sources in the baseline and project scenarios and the leakage that occurs during the project activity. Project boundary has been delineated in accordance with provisions of Paragraphs 14, 15, 16 of the Guidance.

Table 11. Sources of GHG emissions in the baseline and project scenario

Baseline	Source	Gas	Included/Excluded	Justification / Explanation
	Waste heap burning	CO_2	Included	Main emission source

[24] Foreign Direct Investment in Ukraine – Donbass, Philip Burris, Problems of foreign economic relations development and attraction of foreign investments: regional aspect., ISSN 1991-3524, Donetsk, 2007. p. 507-510

<table>
<tr><td></td><td>Coal consumption</td><td>CO_2</td><td>Excluded</td><td>This coal is displaced in the project activity by the coal extracted from the waste heaps. This emission source is equal to the one present in the project scenario and, therefore is excluded from consideration.</td></tr>
<tr><td rowspan="3">Project scenario</td><td>Coal consumption</td><td>CO_2</td><td>Excluded</td><td>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</td></tr>
<tr><td>Electricity use for the process of coal extraction from the waste heap</td><td>CO_2</td><td>Included</td><td>Main emission source</td></tr>
<tr><td>Fossil fuel (diesel) consumption for the process of coal extraction from the waste heap</td><td>CO_2</td><td>Included</td><td>Main emission source</td></tr>
</table>

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

In the project scenario waste heaps under processing are taken down and all combustible matter is extracted. 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 coal extraction plant with rock from the waste heaps. Electricity is used to run the project equipment. Additional coal provided by the project reduces the need for coal to be mined from underground. Emission sources in the project scenario:

- Carbon dioxide emissions from the use of fuel to run part of the project equipment (motor cars),
- Carbon dioxide emissions associated with the electricity consumption by the project equipment.

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 project 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

This project will result in a net change (reduction) 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.

The following figures show the project boundaries and sources of emissions in the baseline scenario and in the project scenario.

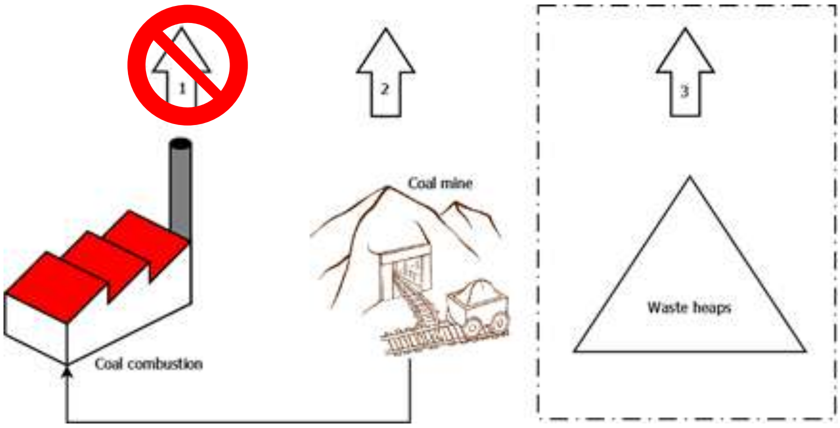

Figure 6. Project boundaries in the baseline scenario

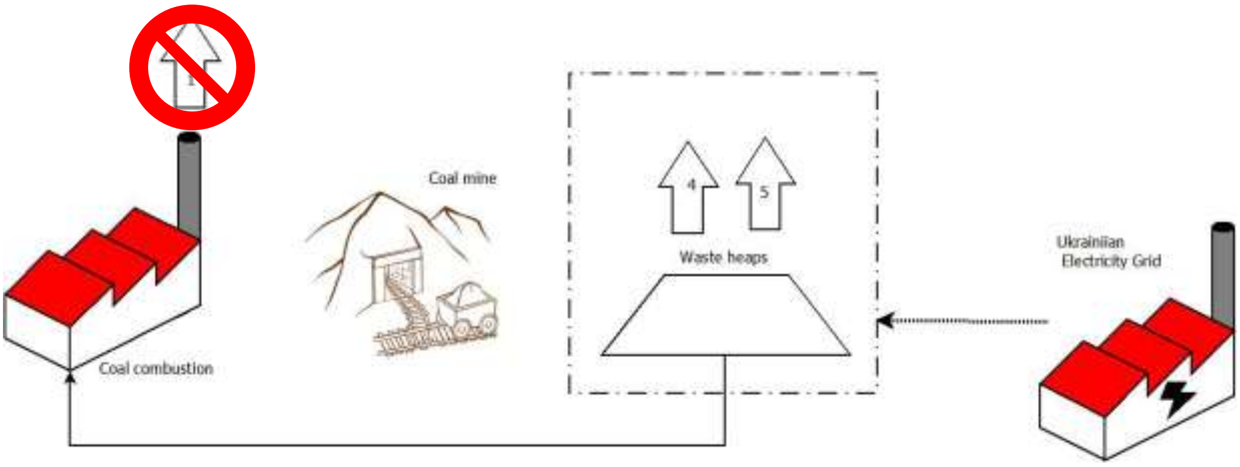

Figure 7. Project boundaries in the project scenario

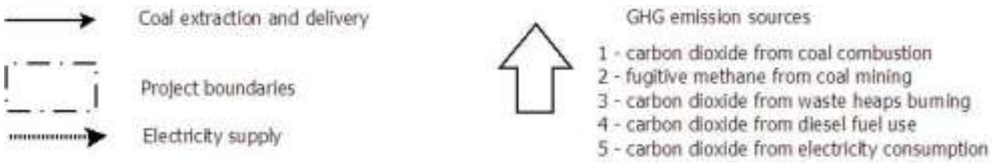

Figure 8. Legend for project boundary schematics

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

Date of baseline setting: 15/02/2012

Name of person/entity setting the baseline:

Person: Iurii Volodymyrovych Petruk, JI Consultant

Entity: Global Carbon B.V.

E. mail: Petruk@global-carbon.com

Phone: +380 44 272 0897

Fax: +380 44 272 0887

Global Carbon B.V. is the project developer and a project participant. The contact details are available in Annex 1.

SECTION C. Duration of the project / crediting period

C.1. Starting date of the project:

Starting date of the project is 19 January, 2009. This is the date when preparation of the project site for the project implementation began.
The plant started its operation on 1 April 2011 after the order for putting into operation from 30 March, 2011.

C.2. Expected operational lifetime of the project:

The operation lifetime of the project is taken as 15 years and 0 month or 180 month.

According to Glossary of Joint Implementation terms, Version 03[25], the operational lifetime of a project is "the period during which the project is in operation. The crediting period shall not extend beyond the operational lifetime of the project". Regarding the specifics of this particular project there are two crucial factors for the project operation: availability of rock for coal enrichment and lifetime of the equipment. First one cannot be precisely determined at current stage, because there are plans for purchasing new waste heaps, so it is assumed that this factor is not limiting operational lifetime of the project. On the other hand, it's difficult to identify the lifetime of the equipment because the project activity is executed at system of interconnected pieces of equipment, none of which can be considered as most important. Each of the pieces in case of break down can be replaced, and the system will continue its operation. To find out how long operational lifetime of the entire system can be, it was decided to use the approach adopted by Ukrainian legislation for determining depreciation period of the "structure", which in accordance with article 145 of Ukrainian Tax Code is 15 years.

C.3. Length of the crediting period:

Start of the crediting period: 01/04/2011.
End of the crediting period: 31/03/2026
Length of crediting period: 15 years and 0 months or 180 months.

Length of the part of crediting period within the first commitment period of the Kyoto Protocol: 1 year and 9 months or 21 months (01/04/2011-31/12/2012).
Length of the part of crediting period after the first commitment period of the Kyoto Protocol: 13 years and 3 months or 159 months (01/01/2013-31/03/2026).

Extension of its crediting period beyond 2012 is subject to the approval by the host Party. The status of emission reductions or enhancements of net removals generated by JI projects after the end of the first commitment period of the Kyoto Protocol may be determined by any relevant agreement under the UNFCCC.

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

SECTION D. Monitoring plan

D.1. Description of monitoring plan chosen:

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

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

Option *a* provided by the Guidelines for the Users of the Joint Implementation Project Design Document Form, Version 04[26] is used: JI specific approach is used in this project and therefore will be used for establishment of monitoring plan.

Step 2. Application of the approach chosen

Baseline scenario

The baseline scenario is the continuation of the existing situation. Coal is produced by the underground mines and is used for energy generation. Waste heaps are often self-heating and burning causing carbon dioxide emissions into the atmosphere. Emission sources in the baseline that are included into the project boundary are:

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

Project scenario

In the project scenario waste heaps under processing are taken down and all combustible matter is extracted. Therefore, the possibility of emissions due to spontaneous self-heating and burning of these waste heaps is eliminated. Project activity anticipates combustion of auxiliary diesel fuel to supply coal extraction plant with rock from the waste heaps. Electricity is used to run the project equipment. Additional coal provided by the project reduces the need for coal to be mined from underground. Emission sources in the project scenario:

- Carbon dioxide emissions from the use of fuel to run part of the project equipment (motor cars);
- Carbon dioxide emissions associated with the electricity consumption by the project equipment.

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.

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

Leakage

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).

Emission reductions

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

- Removing the source of greenhouse gas emissions from the combustion of waste heaps by the extraction of coal from the waste heaps;
- Negative leakage from the reduced fugitive emissions of methane due to the replacement of coal that would have been mined, by the project.

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

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

   This parameter is registered by specialized electricity meters. The meters are installed in an electrical transformer substation adjacent to the beneficiation plant. These meters register all electric energy consumed by the project activity. Readings are used in the commercial dealings with the energy supply company. Monthly bills for electricity are available. 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 that has been used for the project activity in the relevant period.**

   For the metering of this parameter the commercial data of the company are 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. 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 (GOST 305-82 Diesel Fuel. Specifications[27]). Regular cross-checks with the suppliers are carried out. Monthly and annual reports are based on these data.

3. **Amount of coal that has been extracted from the waste heaps and combusted for energy use in the project activity in the relevant period which is equal to the amount of coal that has been mined in the baseline scenario and combusted for energy use.**

   For the metering of this parameter the commercial data of the company are used. Receipts and acceptance certificates from the customers are used in order to confirm the amount of coal restored. Only shipped coal is taken into account and is attributed to the project activity. Weighting of the coal shipped to customers is done by automobile or railway scales. Regular cross-checks with the customers are performed. For additional cross-check of the data, on-site automobile scales are used. The monthly and annual reports are based on these shipment data.

[27] DSTU 3868-99 Diesel Fuel. Specifications. 0.85 kg/l is taken as an average between two suggested types of diesel: summer and winter

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

Table 12. List of constants used in the calculations of emissions

Data / Parameter	***Data unit***	***Description***	***Data Source***	***Value***
GWP_{CH4}	$tCO_2e/ t\ CH_4$	Global Warming Potential of Methane	IPCC Second Assessment Report[28]	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. Measurement units have been converted from $Gg \cdot m^{-3}$ to t/m^3. IPCC Standard (at temperature 20˚C and 101 325 Pa)	0.00067
p_{WHB}	ratio	Correction factor for the uncertainty of the waste heaps burning process	Scientific study - Analysis on the fire risk of Luhansk Region's waste heaps, Scientific Research Institute "Respirator", Donetsk, 2010	0.699

[28] *"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.

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 year y as a result of the implementation of the project activity	Company records, electricity meters	MWh	m	continuously with monthly totals	100%	Electronic and paper	This parameter is registered with a specialized electricity meters.
2	$FC_{PJ,Diesel,y}$ - Amount of diesel fuel that has been used for the project activity in year y	Company records	t	m	monthly	100%	Electronic and paper	For the metering of this parameter the commercial data of the company are used. Receipts and other accounting data are used in order to confirm the amount of fuel consumed.
3	$EF_{CO2,EL,y}$ – CO_2 emission factor for 2nd voltage class grid connected power	Calculation performed for Ukrainian DFP	tCO_2e/MWh	e	Annually	100%	In electronic and paper form	Monitored upon issue of the Ukrainian DFP order

	consumption in year *y* for JI project consuming electricity							
4	$NCV_{Diesel,y}$ - Net calorific value of diesel fuel in year *y*	National Inventory Reports	TJ/kt	e	Ex-post as provided by the Ukrainian DFP on an annual basis	100%	Electronic and paper	Latest country specific data available
5	$OXID_{Diesel,y}$ - Carbon Oxidation factor of diesel fuel in year *y*	National Inventory Reports	ratio	e	Ex-post as provided by the Ukrainian DFP on an annual basis	100%	Electronic and paper	Latest country specific data available
6	$k^{C}_{Diesel,y}$ - Carbon content of diesel fuel in year *y*	National Inventory Reports	tC/TJ	e	Ex-post as provided by the Ukrainian DFP on an annual basis	100%	Electronic and paper	Latest country specific data available

The table above includes data and parameters that are monitored throughout the crediting period.

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

Emissions from the project activity are calculated as follows:

$$PE_y = PE_{EL,y} + PE_{Diesel,y}$$ (Equation 5)

Where:

PE_y - Project Emissions due to project activity in year *y*, (tCO_2e);

$PE_{EL,y}$ - Project Emissions due to consumption of electricity from the grid by the project activity in year *y*, (tCO_2e);

$PE_{Diesel,y}$ - Project Emissions due to consumption of diesel fuel by the project activity in year *y*, (tCO_2e).

These, in turn, are calculated as:

$$PE_{EL,y} = EC_{PJ,y} \cdot EF_{CO2,EL,y} \quad \text{(Equation 6)}$$

Where:

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

$EF_{CO2,EL,y}$ - CO_2 emission factor for 2nd voltage class grid connected power consumption in year *y* for JI project consuming electricity.

$$PE_{Diesel,y} = \frac{FC_{PJ,Diesel,y}}{1000} \cdot NCV_{Diesel,y} \cdot OXID_{Diesel,y} \cdot k^{C}_{Diesel,y} \cdot 44/12 \quad \text{(Equation 7)}$$

Where:

$FC_{PJ,Diesel,y}$ - Amount of diesel fuel that has been used for the project activity in year *y*, (t).

$NCV_{Diesel,y}$ - Net Calorific Value of diesel fuel in the year *y*, (TJ/kt),

$OXID_{Diesel,y}$ - Carbon Oxidation factor of diesel fuel in the year *y*, (ratio),

$k^{C}_{Diesel,y}$ - Carbon content of diesel fuel in the year *y*, (tC/TJ),

$44/12$ - Ratio between molecular mass of CO_2 and C. Reflects 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
7	$FC_{BE,Coal,y}$ - Amount of coal that has been mined in the baseline scenario and combusted for energy use, equivalent to the amount of coal extracted from the waste heaps in the project activity in year y	Company records	t	m	monthly	100%	Electronic and paper	For the metering of this parameter the commercial data of the company are used. Receipts and acceptance certificates from the customers are used in order to confirm the amount of coal restored. For additional cross-check of the data, on-site automobile scales are used.
8	$NCV_{Coal,y}$ - Net Calorific Value of coal in year *y*	National Inventory Reports	GJ/t	e	Ex-post as provided by the Ukrainian DFP on an annual basis	100%	Electronic and paper	Latest country specific data available

9	$OXID_{Coal,y}$ - Carbon Oxidation factor of coal in year *y*	National Inventory Reports	ratio	e	Ex-post as provided by the Ukrainian DFP on an annual basis	100%	Electronic and paper	Latest country specific data available
10	$k^{C}_{Coal,y}$ - Carbon content of coal in year *y*	National Inventory Reports	tC/TJ	e	Ex-post as provided by the Ukrainian DFP on an annual basis	100%	Electronic and paper	Latest country specific data available

The table above includes data and parameters that are monitored throughout the crediting period.

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

Emissions in the baseline scenario are calculated as follows:

$$BE_y = BE_{WHB,y} \quad \text{(Equation 8)}$$

Where:

BE_y - Baseline Emissions in year *y*, (tCO_2e);

$BE_{WHB,y}$ - Baseline Emissions due to burning of the waste heaps in year *y*, (tCO_2e).

These, in turn, are calculated as:

$$BE_{WHB} = \frac{FC_{BE,Coal,y}}{1000} \cdot p_{WHB} \cdot NCV_{Coal,y} \cdot OXID_{Coal,y} \cdot k^{C}_{Coal,y} \cdot 44/12 \quad \text{(Equation 9)}$$

Where:

$FC_{BE,Coal,y}$ - Amount of coal that has been mined in the baseline scenario and combusted for energy use, equivalent to the amount of coal extracted from the waste heaps in the project activity in year *y*, (t);

p_{WHB} - Correction factor for 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. This number is taken from the study[29] of waste heaps in Luhansk region and is defined as the ratio of waste heaps that are or have been on fire historically to all existing waste heaps of Luhansk region. This ratio is equal to 0.699 according to this study, (ratio);

$NCV_{Coal,y}$ Net calorific value of coal in year *y*, (TJ/kt);

$OXID_{Coal,y}$ Carbon Oxidation factor of coal in year *y*, (ratio);

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

$44/12$ Ratio between molecular mass of CO_2 and C. Reflects oxidation of C to CO_2.

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

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

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).

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
11	$FC_{BE,Coal,y}$ - Amount of coal that has been mined in the baseline scenario and combusted for energy use, equivalent to the amount of coal extracted from the waste heaps in the project activity in year y	Company records	t	m	monthly	100%	Electronic and paper	For the metering of this parameter the commercial data of the company are used. Receipts and acceptance certificates from the customers are used in order to confirm the amount of coal restored. For additional cross-check of the data, on-site automobile scales are used.

12	$EF_{CH_4,CM,y}$ - Carbon dioxide emission factor for fugitive methane emissions from coal mining in year *y*	National Inventory Reports	m^3/t	e	Ex-post as provided by the Ukrainian DFP on an annual basis	100%	Electronic and paper	Latest country specific data available

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 year y are calculated as follows:

$$LE_y = LE_{CH_4,y} \quad \text{(Equation 10)}$$

Where:

LE_y - Leakages in year *y*, (tCO_2e);

$LE_{CH_4,y}$ - Leakages due to fugitive emissions of methane in the mining activities in year *y*, (tCO_2e).

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

$$LE_{CH_4,y} = -FC_{BE,Coal,y} \cdot EF_{CH_4,CM,y} \cdot \rho_{CH_4} \cdot GWP_{CH_4} \quad \text{(Equation 11)}$$

Where:

$FC_{BE,Coal,y}$ - Amount of coal that has been mined in the baseline scenario and combusted for energy use, equivalent to the amount of coal extracted from the waste heaps in the project activity in year y, (t);

$EF_{CH_4,CM,y}$ Emission factor for fugitive methane emissions from coal mining in year y, (m^3/t);

ρ_{CH4} Methane density, (t/m^3);

GWP_{CH4} Global Warming Potential of Methane, (tCO_2e/ t CH_4).

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

The annual emission reductions are calculated as follows:

$$ER_y = BE_y - LE_y - PE_y \quad \text{(Equation 12)}$$

Where:

ER_y – Emissions reductions of the JI project in year y, (tCO_2e);

LE_y – Leakages in year y, (tCO_2e);

BE_y – Baseline Emission in year y, (tCO_2e);

PE_y – Project Emission in year y, (tCO_2e).

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. In case of malfunction of power meters, the plant will provide conservative data estimated on basis on values for the previous period.
D.1.1.1. – ID 2	Low	These data are used in the commercial activity of the company. Accounting documentation will be used for monitoring. In case of loss or absence of receipts and other accounting data that are used to confirm the amount of diesel fuel consumed, the plant will request copies of the relevant documents from a supplier. If this does not work, the data will be derived by a conservative estimation based on data for the previous period.

D.1.1.3. – ID 3	Low	Value is based on the calculations of Ukrainian DFP for the corresponding year. If no new emission factor for power consumed from the grid is issued by Ukrainian DFP, data for the previous year will be applied.
D.1.1.3. – ID 7 D.1.3.1. – ID 11	Low	These data are used in commercial activities of the company. In case of loss or absence of receipts and other accounting data that are used to confirm the amount of coal restored, the plant will request copies of the relevant documents from a customer. If this does not work, the data will be derived by a conservative estimation based on data for the previous period or use the data obtained from on-site measuring by the automobile scales.
D.1.1.1. – ID 4, 5, 6 D.1.3.1. – ID 8, 9, 10 D.1.3.1. – ID 12	Low	These are country-specific values issued by Ukrainian DFP which are publicly available in National Inventory Reports of Ukraine. It is expected that the new values will be issued by Ukrainian DFP on an annual basis.

The data required for monitoring of anthropogenic emissions due to the project activities will be kept electronically and in paper form for at least 2 years after last transfer of emission reduction units.

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

The project owner "FPG "SKHID-ZAKHID" LLC will implement provisions of this monitoring plan into its organizational and quality management structure. For monitoring, collection, registration, visualization, archiving, reporting of the monitored data and periodical checking of the measurement devices the management team headed by the Director of the company is responsible. A detailed structure of the team and team members will be established in the Monitoring Manual prior to initial and first verification. The principle structure presents on the following flow-chart:

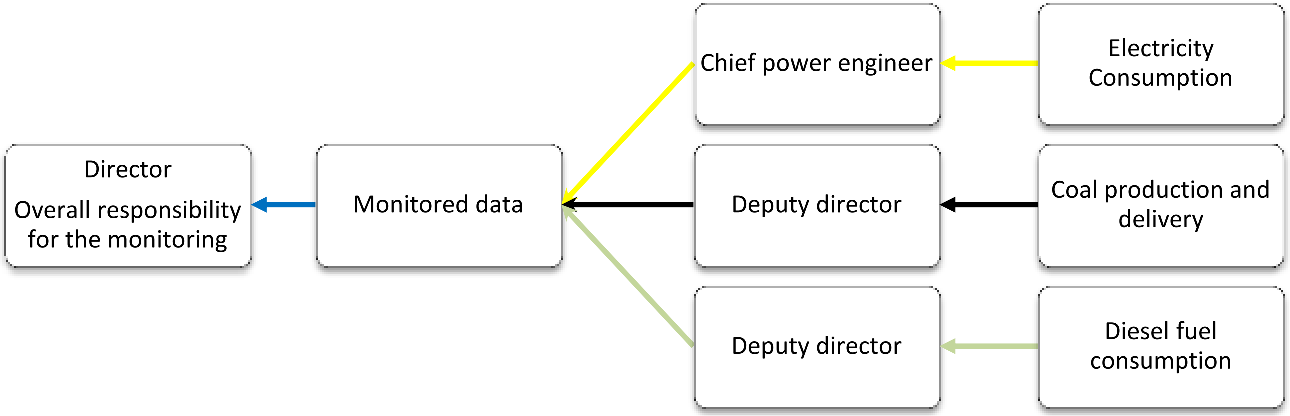

Figure 9. Monitoring flowchart

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

Name of person/entity establishing the monitoring plan:

Person: Iurii Volodymyrovych Petruk, JI Consultant

Entity: Global Carbon B.V.

E. mail: Petruk@global-carbon.com

Phone: +380 44 272 0897

Fax: +380 44 272 0887

Global Carbon B.V. is the project developer and a project participant. The contact details are available in Annex 1.

SECTION E. Estimation of greenhouse gas emission reductions

E.1. Estimated project emissions:

Table 13. Estimated project emissions over 2011-2012

	Unit	2011	2012	Total
Project emissions due to consumption of electricity from the grid by the project activity	tCO_2e	3 644	4 859	**8 503**
Project emissions due to consumption of diesel fuel by the project activity	tCO_2e	1 424	1 898	**3 322**
Project emissions	tCO_2e	**5 068**	**6 757**	**11 825**

Table 14. Estimated project emissions over 2013-2026

Year	Project emissions due to consumption of electricity from the grid by the project activity (tonnes of CO_2 equivalent)	Project emissions due to consumption of diesel fuel by the project activity (tonnes of CO_2 equivalent)	Project emissions (tonnes of CO_2 equivalent)
2013	4 859	1 898	**6 757**
2014	4 859	1 898	**6 757**
2015	4 859	1 898	**6 757**
2016	4 859	1 898	**6 757**
2017	4 859	1 898	**6 757**
2018	4 859	1 898	**6 757**
2019	4 859	1 898	**6 757**
2020	4 859	1 898	**6 757**
2021	4 859	1 898	**6 757**
2022	4 859	1 898	**6 757**
2023	4 859	1 898	**6 757**
2024	4 859	1 898	**6 757**
2025	4 859	1 898	**6 757**
2026	1 215	475	**1 690**
Total	**64 382**	**25 149**	**89 531**

E.2. Estimated leakage:

Table 15. Estimated leakages over 2011-2012

	Unit	2011	2012	Total
Leakages due to fugitive emissions of methane in the mining activities	tCO_2e	-48 759	-65 012	**-113 771**
Total leakages	tCO_2e	**-48 759**	**-65 012**	**-113 771**

Table 16. Estimated leakages over 2013-2026

Year	Leakages due to fugitive emissions of methane in the mining activities (tonnes of CO_2 equivalent)	Total leakages (tonnes of CO_2 equivalent)
2013	-65 012	**-65 012**
2014	-65 012	**-65 012**
2015	-65 012	**-65 012**
2016	-65 012	**-65 012**
2017	-65 012	**-65 012**
2018	-65 012	**-65 012**
2019	-65 012	**-65 012**
2020	-65 012	**-65 012**
2021	-65 012	**-65 012**
2022	-65 012	**-65 012**
2023	-65 012	**-65 012**
2024	-65 012	**-65 012**
2025	-65 012	**-65 012**
2026	-16 253	**-16 253**
Total	**-861 409**	**-861 409**

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

Table 17. Estimated total project emissions over 2011-2012

	Unit	2011	2012	Total
Total project emissions	tCO_2e	-43 691	-58 255	**-101 946**

Table 18. Estimated total project emissions over 2013-2026

Year	Total project emissions (tonnes of CO_2 equivalent)
2013	**-58 255**
2014	**-58 255**
2015	**-58 255**
2016	**-58 255**
2017	**-58 255**
2018	**-58 255**
2019	**-58 255**
2020	**-58 255**
2021	**-58 255**
2022	**-58 255**
2023	**-58 255**
2024	**-58 255**
2025	**-58 255**
2026	**-14 563**
Total	**-771 878**

E.4. Estimated baseline emissions:

Table 19. Estimated baseline emissions over 2011-2012

	Unit	2011	2012	Total
Baseline emissions due to burning of the waste heaps	tCO_2e	188 641	251 522	**440 163**
Total baseline emissions	tCO_2e	**188 641**	**251 522**	**440 163**

Table 20. Estimated baseline emissions over 2013-2026

Year	Baseline emissions due to burning of the waste heaps (tonnes of CO_2 equivalent)	Total baseline emissions (tonnes of CO_2 equivalent)
2013	251 522	**251 522**
2014	251 522	**251 522**
2015	251 522	**251 522**
2016	251 522	**251 522**
2017	251 522	**251 522**
2018	251 522	**251 522**
2019	251 522	**251 522**
2020	251 522	**251 522**
2021	251 522	**251 522**
2022	251 522	**251 522**
2023	251 522	**251 522**
2024	251 522	**251 522**
2025	251 522	**251 522**
2026	62 880	**62 880**
Total	**3 332 666**	**3 332 666**

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

Table 21. Estimated emission reductions over 2011-2012

	Unit	2011	2012	Total
Emission reductions	tCO_2e	232 332	309 777	**542 109**

Table 22. Estimated emission reductions over 2013-2026

Year	Emission reductions (tonnes of CO_2 equivalent)
2013	**309 777**
2014	**309 777**
2015	**309 777**
2016	**309 777**
2017	**309 777**
2018	**309 777**
2019	**309 777**
2020	**309 777**
2021	**309 777**
2022	**309 777**
2023	**309 777**
2024	**309 777**
2025	**309 777**
2026	**77 443**
Total	**4 104 544**

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

Table 23. Estimated balance of emissions under the proposed project over 2011-2012

Year	Estimated project emissions (tonnes of CO_2 equivalent)	Estimated leakage (tonnes of CO_2 equivalent)	Estimated baseline emissions (tonnes of CO_2 equivalent)	Estimated emission reductions (tonnes of CO_2 equivalent)
Year 2011	5 068	-48 759	188 641	232 332
Year 2012	6 757	-65 012	251 522	309 777
Total (tonnes of CO_2 Equivalent)	**11 825**	**-113 771**	**440 163**	**542 109**

Table 24. Estimated balance of emissions under the proposed project over 2013-2026

Year	Estimated project emissions (tonnes of CO_2 equivalent)	Estimated leakage (tonnes of CO_2 equivalent)	Estimated baseline emissions (tonnes of CO_2 equivalent)	Estimated emission reductions (tonnes of CO_2 equivalent)
Year 2013	6 757	-65 012	251 522	309 777
Year 2014	6 757	-65 012	251 522	309 777
Year 2015	6 757	-65 012	251 522	309 777
Year 2016	6 757	-65 012	251 522	309 777
Year 2017	6 757	-65 012	251 522	309 777
Year 2018	6 757	-65 012	251 522	309 777
Year 2019	6 757	-65 012	251 522	309 777
Year 2020	6 757	-65 012	251 522	309 777
Year 2021	6 757	-65 012	251 522	309 777
Year 2022	6 757	-65 012	251 522	309 777
Year 2023	6 757	-65 012	251 522	309 777
Year 2024	6 757	-65 012	251 522	309 777
Year 2025	6 757	-65 012	251 522	309 777
Year 2026	1 690	-16 253	62 880	77 443
Total (tonnes of CO_2 equivalent)	**89 531**	**-861 409**	**3 332 666**	**4 104 544**

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

Annex F of this standard contains a list of "types of projects or activities which constitute higher environmental risk" for which full EIA is mandatory, and the Ministry of Ecology and Natural Resources of Ukraine being the competent authority. The project, which activity is the utilization of coal mining waste and production of coal, is included in this list.

The full scope EIA in accordance with the Ukrainian legislation has been performed for the proposed project on 15 March, 2011 by SPE "Firma Pryroda" which is licensed for development of EIA documents by Luhansk Regional State Administration of Town Building and Architecture.

Key findings of this EIA are summarized below:

- One of the main hazardous substances, derived from processing of coal rock is dust dealing with technological and transport equipment. Dust control is carried out through water irrigation at the sites of bulldozers and loaders operation, and by watering of roads;
- Accepted ways of waste management will be introduced in accordance with the requirements of normative documents of modern methods and technology of recycling and disposal of industrial and generated municipal waste, which exclude their long-term accumulation in the plant, as well as pollution of air, groundwater and mineral resources;
- Operation of the designed object can be judged not likely to seriously affect climate, microclimate, geological environment, flora and fauna in relation to design solutions for construction and operation of the designed object.

EIA considered the following main positive effects that appear due to realization of the proposed project:

- Production of energy fuel which can be utilized in different industrial sectors;
- Providing additional work places for citizens of neighbouring areas;
- Decreasing the level of contaminative particles discharge in the ground water due to purification, decontamination and utilization of waste water at the plant;
- Carrying out campaign directed at recultivation, landscaping, and gardening of the released area.

The list of available EIA documentation includes:

- Working project. Building and maintenance of beneficiary equipment, garages and sorting complex at the site of the former mine Mine #3-80 GP “Rovenkiantracite”. Explanatory Note. Environmental Impact Assessment. SPE “Firma Pryroda”. Luhansk, 2011.

[30] *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:

The full scope EIA in accordance with the Ukrainian legislation has been conducted for the proposed project on 15 March, 2011 by SPE "Firma Pryroda". The findings of the report are summarized in the section F.1. above. The report has been reviewed by the competent authorities of Ukraine. The environmental impact of the project has not been considered significant or prohibitive. Completion of Environmental Impact Assessment reports and positive findings of the competent state authority conclude the procedure of the environmental impact assessment according to the Ukrainian laws and regulations.

SECTION G. Stakeholders' comments

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

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

Annex 1

CONTACT INFORMATION ON PROJECT PARTICIPANTS

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URL:	
Represented by:	
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Salutation:	Ms.
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KVED types of economic activities:	10.10.1 Mining and beneficiation of coal; 51.51.0 Wholesale trade of fuel; 45.21.1 Construction of buildings; 60.24.0 Freight transport activity; 71.10.0 Rent a car; 74.87.0 Provision of other commercial services

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Annex 2

BASELINE INFORMATION

Table containing the key elements of the baseline

Table 25. Key elements of the baseline scenario

#	Parameter	Data unit	Source of data
1	$FC_{BE,Coal,y}$ Amount of coal that has been mined in the baseline scenario and combusted for energy use, equivalent to the amount of coal extracted from the waste heaps in the project activity in year y	t	Data of project owner
2	p_{WHB} Correction factor for the uncertainty of the waste heaps burning process.	ratio	Scientific study - Analysis on the fire risk of Luhansk Region's waste heaps, Scientific Research Institute "Respirator", Donetsk, 2010
3	NCV_{Coal} Net calorific value of coal	TJ/kt	National Inventory Report of Ukraine 1990-2009[31], p. 399 (value for stationary combustion, power and heat production, 2009)
4	$OXID_{Coal}$ Carbon Oxidation factor of coal	ratio	National Inventory Report of Ukraine 1990-2009, p. 402 (value for stationary combustion, power and heat production, 2009)
5	k^{C}_{Coal} Carbon content of coal	t C/TJ	National Inventory Report of Ukraine 1990-2009, p. 401 (value for stationary combustion, power and heat production, 2009)

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

Annex 3

MONITORING PLAN

For the monitoring plan please refer to section D of this PDD.