THE JOINT IMPLEMENTATION PROJECT

WASTE PRODUCTS UTILIZATION OF COAL BENEFICATION PROCESS WITH THE AIM OF DECREASING GREENHOUSE GASES EMISSIONS INTO THE ATMOSPHERE AT THE SLUDGE DEPOSITORY OF MEP SLAVIANOSERBSKA

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JOINT IMPLEMENTATION PROJECT DESIGN DOCUMENT FORM
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CONTENTS

Annexes

SECTION A. General description of the project

A.1. Title of the project:

Waste products utilization of coal benefication process with the aim of decreasing greenhouse gases emissions into the atmosphere at the sludge depository of MEP Slavianoserbska
Sectoral scope: 8. Mining/mineral production
PDD version: PDD, version 2.0
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A.2. Description of the project:

General description of the sector, company and activities

In the Donetsk Basin there is one of the largest deposits of coal in the world (Ukraine by geological reserves of fossil coal ranks first in Europe and eighth in the world). Coal production in Donbass is carried out mostly through mining and has 300-year history.

The total basin area is about 60 th. km^2 and covers the territory of Dnipropetrovsk, Donetsk and Luhansk regions. Stocks of coal up to a depth of 1800 m are about 140.8 billion tons[1]. Coal is used as steam fuel or as a feedstock for coke production. However, Donetsk coal is an organic compounds with high ash content (up to 40% in raw coal)[2] and has high pyrite sulphur content (4-10%). Therefore, before its use in technological processes, raw coal must pass a preliminary benefication stage at the enrichment plant. Waste products are left after coal benefication – coal slurry, which is accumulated in ponds; slurry ponds are not widely used and are the constant source of environmental contamination.

At present 56 slurry ponds of enrichment plants of Ukraine contain 160 million tons of coal slurry or flotation wastes. They can be an additional source of energy.Ash content of such rock mass in the slurry pond ranges of 30-70% and the organic residue content is 30-50%.[3]. However, technologies used for carbonaceous components removal out off-balance sheet products can't do it to the full.Therefore, due to the energy resources shortage, it is important to carry out specific scientific-research in the scale of the coal industry with the aim to create new technologies that reduce to a minimum the coal losses with waste products, as well as the use off-balance sheet products-flotation and benefication wastes in the power system; it will significantly reduce material costs for one unit production and significantly improve the environment of the region. Considering the fact that the average ash content of extracted coal in Ukraine every year increases, on the agenda is the question about the improvement of the enrichment process at the enrichment plants on one side and waste products utilization of coal benefication processes on the other. However, to date technological deposits are used in a small scale. The main reason of such situation is that, for technological deposits wide involvement in the processing, it is necessary to construct virtually new industries, implementation of new technological principles and solutions that are usually designed at the level of scientific laboratory discoveries or semi-production researches and rarely brought to the industrial production[4]. Therefore, high capital intensity for new construction and reconstruction with sequential replacement of existing production lines for new production is required.

Most of the coal is produced by large coal-mining unions of different ownership. Along with them, there are small private companies involved in coal extraction and its processing (sorting, enrichment) and fuel trade.

PE "SPETSMONTAZH FC" Ltd.is engaged in wholesale fuel, has considerable experience in excavation and mining. PE "SPETSMONTAZH FC" uses slurry pond of MEP Slavianoserbska on legitimate basis (according to the Agreement #16/08 from 26/08/2008 with the customer-

[1] BS Busygin, Dr. Sc. Sciences, prof., EL Sergeyev. Monitoring data of Donbass heaps by multispectral satellite imagery. ISSN 2071-2227, Naukovy Visnyk of the NGU, 2011, № 2

[2] Довідник показників якості, обсягу видобутку вугілля та випуску продуктів збагачення у 2008-2010 рр. Мінвуглепром України, Держспоживстандарт України (див. Додаток 4)

[3] http://masters.donntu.edu.ua/2012/feht/snezhok/library/article6.htm

[4] http://www.referatnatemu.com/1404

"Luhanskvuhletehpostavka" Ltd.; according to the Agreement, the performer of works on mine technical reclamation PE "SPETSMONTAZH FC" leaves the rock, which was obtained during implementation of works, as the payment for work, and has the right to use and dispose of it at their own discretion.
"Merydian" Ltd. is a contractor of slurry pond dismantling and sorting; PE "SPETSMONTAZH FC" has signed a Contract of work completion # 126 from 26/08/2008 with "Merydian" Ltd.
Enrichment plant "Shidno-Ukrainska Zbagachuvalna kompaniya" is involved in the process of carbonaceous waste enrichment; carbonaceous waste is obtained during dismantling under the tolling (according to the Agreement # 32/08/08-1 from 26/08/08), and receives payment from PE "SPETSMONTAZH FC" for each ton of recycled carbonaceous waste (see accompanying materials).
Situation before the proposed project start
The current situation concerning waste utilization in Luhansk region is currently unfavorable for the environment. The most important environmental challenge for the Luhansk region is the reduction of waste accumulation through reducing their formation and extensive use.However, levels of waste products use are extremely low at the moment.
Carbonaceous mass, that is located in the slurry pond (sludge depository), is actually waste products of coal benefication process, therefore, it is a fine dust-like coal fraction similar to one observed in coal mines during sudden releases; during slurry pond processing, oxidation process may take place with further self-heating and spontaneous ignition.When sudden releases in coal mines occure, even on coal layers that are not prone to spontaneous ignition, discarded coal often ignite. At the same time the factor of loosened coal heat exchange and air filtering through it plays a significant role.In most cases spontaneous ignition of discarded coal occurred during the first 5-8 days after it had been discarded; the fire takes place at the depth of 3-5 sm from the surface of the discarded coal. Regarding slurry ponds there is a large heat leakage, but also there is a large mass of fine pulverized coal, especially in the upper layers; therefore, oxidation and subsequent self-heating may occure. Defining stage of self-heating processes of carbonaceous materials in slurry ponds is a low temperature oxidation stage.Ambient temperature causes oxidation to the critical temperature. It is related with coal ability to adsorb oxygen from the following chemical reaction, where a significant greenhouse effect (200-400 kJ / mol) takes place.This process is very extended in time period; if self-heating sources appear, they will be located at a depth of about 1 m
Oxidation and slurry ponds burning is accompanied by emissions of a wide range of volatile components that are released from the slurry enriched by coal substance. Hot slurry ponds produce steam, which may contain water and sulfuric acid (sulfate ion), carbon dioxide, nitrogen dioxide (nitrate ion). With a lack of oxygen, vapour and gas emissions contain hydrogen sulfide, hydrocarbons, ammonia and carbon monoxide. Water erosion causes in leaching of toxic components and contamination of soil and groundwater spreading them over long distances. Thus, the role of slurry ponds in the ecology of the region is extremely negative and increases in many times during their burning. However, an outbreak and its very possibility is difficult to forecast, we can only estimate the probability of ignition, which is very high and based on statistics[5].
Despite the fact that the owners of slurry ponds obliged to take measures to prevent their burning and its immediate quenching, it is not common practice in the Donbass region. Fines paid by pollution costs much less than money spent on measures to prevent ignition or burning. In the baseline scenario assumed that the common practice will be continued - heap may be spontaneously ignited with a certain probability, and the process of burning will continue while the all coal, contained there, will burn. The process of combustion is accompanied by release the carbon dioxide into the atmosphere.
In the baseline scenario assumed that the common practice will be continued – slurry pond can spontaneously ignite, and the process of burning will continue till the significant amount of coal contained there will be burned. The process of combustion is accompanied by release of carbon dioxide into the atmosphere.
Proposed project provides a complete slurry pond dismantling and slurry utilization.The project activities are aimed at coal extraction from the slurry pond of PE "SPETSMONTAZH FC" with the aim of decreasing greenhouse gases emissions into the atmosphere and obtaining additional amount of coal. The

[5] SRI report on mine rescue and fire safty "Respirator" 2012. "Report on the propensity for spontaneous ignition of coal benefication waste products of enrichment plant "Shidno-Ukrainska Zbagachuvalna kompaniya". See Annex 6.

dried waste products of coal benefication process (slurry) are sent to the enrichment plant, where the enrichment process takes place. Enriched coal after blending is supplied to boilers and thermal power plants.Implementation of the project solutions ensure safe operation of the complex for the waste products utilization of coal benefication process. An important result of the slurry pond utilization with further use of carbonaceous mass is the eliminating of adverse environmental impacts (dust emissions, greenhouse, harmful and polluting emissions and discharge of contaminated drain water from the slurry pond into the environment)

Thus, waste products of the slurry pond will be fully utilized, and the received coal will replace coal, which must be produced through mining.

Brief history of the project: The project was initiated in August 2008. Industrial site equipping and other preparatory works started on 26/08/2008. Commissioning and the beginning of the dismantling complex work – 01/10/2008. From the beginning the project is considered as JI project. Project idea (PIN) was submitted to assigned Coordinated Center (State Agency of Environmental Investments) on 21/08/2012. From the beginning Joint Implementation Mechanism was one of the prominent factors of the project, and financial benefits under this mechanism were considered as one of the reasons for the project launching.

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)	PE “SPETSMONTAZH FC”	No
Republic of Latvia	SIA “Vidzeme Eko”	No

.The role of project participants:

• PE “SPETSMONTAZH FC”- a legal entity that operates lawfully the slurry pond of MEP Slavianoserbska and introduces the proposed JI project;

• SIA "VidzemeEKO" responsible for the preparation of the PDD, obtaining approvals from the parties, monitoring and transfer of ERUs generated / AAUs.

See detailed information on project participants in Annex 1.

A.4. Technical description of the project:

Technical description of the project, as well as detailed information on the location of the project, are given below in sections from A.4.1. to A.4.3.

A.4.1. Location of the project:

Slurry pond of MEP Slavianoserbska

A.4.1.1. Host Party(ies):

Ukraine

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

Luhansk region, Slavianoserbsk region

Figure 1 - Location of the project on the map of Ukraine

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

Rodakove village

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

Waste products utilization complex of coal benefication process is located on the industrial site near the slurry pond on the suburbs of Rodakove village, Slovianoserbskyi district , Luhansk region.

Geographical coordinates of the project: 48° 32'08.26" N. Lt and 38° 58'34.69" E.Ln.

Complex for the enrichment –"Shidno-Ukrainska Zbagachuvalna kompaniya" is located in the Bile village, Lutuginsk district, Luhansk region at a distance of 25 km from the slurry pond. Geographical coordinates of the plant: 48° 27'56.88" N. Lt and 39°02'47.86" E.Ln.

Figure 2 - Slurry pond involved in the project

Figure 3 – Slurry pond of MEP Slavianoserbska, view from satellite

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

Project technology involves several stages:
-Construction of the intermediate storage, where an excluded raw material is under primary processing. Bulldozer T 170 (total power 164 kW) plans one of the slurry pond's slopes to give it an inclination for natural flow of water contained in the slurry as it fills in the storage. Access roads are filled with rocks not to get technique into sinking in the slurry. Burned rocks of the dump are used to cover the

roads. The thickness of the rock layer must be 50 cm at least. While filling, bulldozer flattens rocks according to the technique movement.
- Slurry extraction from the slurry pond. Excavator ES 360 (operating power 184 kW, load-carrying capacity-11 t) loads slurry into trucks (KRAZ 65055, engine power 243 kW, load-carrying capacity-18 t) and transports it to the primary storage, where it is evenly filled along the edge. Bulldozer flattens it in even layers with the bulldozer blade. As the result of such activities raw material partially loses its moisture. Frontal loader ZL-50F (engine power 162 kW, load-carrying capacity–5 t) loads dried slurry into tracks and transport it to the place of complete machining.
- Processing, enrichment process. Slurry, shipped on the industrial site, is transported to the enrichment plant, where the enrichment process is carried out. Slurry through the receiving hopper is shipped by the feeding conveyer to the scrubber-sizing trammel, where the previous disintegration and classification of source material is carried out before the enrichment process. When slurry gets into the sizing trammel, it crumbles and fall on the sieve, where water, which is supplied under pressure out of nozzles, wash it away as a coal pulp to the under sieve part of the sizing trammel with the set-up size of the upper class. Undersize product – is the rock mass, pieces of clay, reed, branches; all other things move away through the discharge section of the sizing trammel and by feeding conveyer is sent to waste. Pulp by gravity is transmitted to the shaking grizzle equipped with two sieves, where it is separated into three products; two-are oversize products and one is undersize product. Oversize product (concentrate) with humidity 18-22% by feeding conveyer is transported to the sedimentation centrifuge, and from the centrifuge, with humidity 11-12%, to the pile for drying.
- End product can be used for making a charge and be transported to power plants for burning in boilers. It can be used without blending at TPP if it is equipped by boilers, that can use for burning coal with high ash content. Machinery involved in the slurry removal: 4 loaders, 4 bulldozers, 12 excavator, 75 trucks.
The project capacity of the complex allows to process 3500 thousand tons of slurry per year.

Figure 4 – Enrichment plant “Shidno-Ukrainska Zbagachuvalna kompaniya”

Figure 5 – Machinery involved in the project

Construction of the industrial site and the preparatory works begin on August 26, 2008.
Commissioning and the beginning of the dismantling complex work – October 1, 2008

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

The project activities are aimed at coal extraction from the slurry pond of PE "SPETSMONTAZH FC" to prevent emissions into the atmosphere when spontaneous slurry pond ignitions occur and receiving more quantity of coal. After enrichment plant coal is sent for blending with steam coal with subsequent combustion at boiler houses and power plants

The problem of waste products utilization of coal benefication process is very crucial nowadays in the Donbass. Technogenic deposits, slurry ponds as well, not only derive considerable land area from economic turnover and lead to disruption of ecological balance of natural biological community, but also are a source of high environmental hazard. Even at non-burning condition, it is a source of air pollution, soil, nearby water and groundwater contamination. This risk is increased in many times if technological deposit is burning. The only way to eliminate the harmful effects of the slurry pond on the environment is its complete dismantling. However, the process of slurry pond dismantling is a very expensive, and economic benefit is not offset possible costs. In addition there are significant risks associated with the inability to timely determination of coal in total volume of the slurry pond. This leads to a situation where the process of slurry pond dismantling faces financial difficulties, and for its successful implementation it is necessary to search for additional sources of funding. Receipt of additional income from the sale of quotas under the Joint Implementation project provides a powerful incentive for successful completion of this project.

Processing of similar slurry ponds will avoid their burning, improve ecological situation in the region, and significantly reduce CO_2 emissions and other harmful substances. Waste products utilization of this technogenic deposit will reduce the probability of groundwater contamination. The area of the land for agricultural activities and for other purposes will increase. Also, extra amount of coal will be obtained that does not require mining, thus it is possible to avoid leakages of methane, which accompanies coal mining and save a considerable amount of electricity. Emission reductions can be sold as ERUs on the international market of emissions trading.

The proposed project is aimed at reducing anthropogenic emissions. Emission reductions created by:

- Elimination of greenhouse gases sources associated with slurry ponds burning, by extracting coal from them;

- Reduction of uncontrolled methane emissions due to replacement of coal that would have been extracted through mining;
- Reduction of electricity consumption during slurry pond dismantling in comparison to electricity consumption at coal mine.

Efforts to prevent slurry ponds burning and their full dismantling corresponds to the current legislation of Ukraine on the environmental protection. The proposed project is evaluated positively by local authorities.

Detailed description of the baseline and additionality, contained in Section B of the project documentation.

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

Table 2 - The total expected emission reductions over the crediting period

	Years
Length of the crediting period	4 years 3 months
Year	Estimate of annual emission reductions in tonnes of CO_2 equivalent
2008	341390
2009	1904893
2010	1907901
2011	1902408
2012	1914042
Total estimated emission reductions over the crediting period (tonnes of CO_2 equivalent)	**7 970 634**
Annual average of estimated emission reductions over the crediting period (tonnes of CO_2 equivalent)	**1 875 443**

Duration of the crediting period - 4 years 3 months (51 months).
The beginning of the crediting period – 01/10/2008
The end of the crediting period – 31/12/2012

Table 3 - The total expected emission reductions after the crediting period

	Years
Length of the crediting period	2 years
Year	Estimate of annual emission reductions in tonnes of CO_2 equivalent
2013	1914042
2014	1914042
Total estimated emission reductions over the crediting period (tonnes of CO_2 equivalent)	**3 828 084**
Annual average of estimated emission reductions over the crediting period (tonnes of CO_2 equivalent)	**1 914 042**

Duration after the crediting period - 2 years (24 months).

A.5. Project approval by the Parties involved:

Project Idea (PIN) was given to the Designated Coordinating Center (State Environmental Investment Agency) on 21/08/2012. A letter of endorsement #2562/23/7 was received on 12/09/2012. Letter of endorsement #2562/23/7 was received on 12/09/2012. Letter of approval from foreign country # 12.2-02/12395 was received 04/09/12. Parties involved authorize “SPETSMONTAZH FC” (Ukraine) and SIA “Vidzeme Eko” (Latvia) to be participants of the project. Authorization is confirmed by received letter of endorsement and letter of approval. It is planned to get a letter of approval from SEIA in October, 2012.

SECTION B. Baseline

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

The baseline for a JI project should be brought into compliance with Annex B to Decision 9/CMP.1 ("Guidelines for the implementation of Article 6 of the Kyoto Protocol")[6], and according to the "Guidance On Criteria For Baseline Setting And Monitoring”, Version 03[7] (hereinafter - the "Guidance") issued by the supervisory JI (JISC).

Under the Guidelines, the baseline for a JI project is a scenario that objectively represents the anthropogenic emissions of GHG sources or anthropogenic GHG removals by the acquisition, which could occur in the absence of the proposed project. In accordance with paragraph 9 of the Guidance, the project participants may choose either approach the criteria for establishing the baseline and monitoring, designed in accordance with Annex B of the Guidance or method for determining the baseline setting and monitoring adopted by the Executive Committee of the clean development mechanism (CDM).

Article 11 of Guidance allows project participants to choose an approach to JI projects, or use the combination of approved methodologies for CDM baseline or approved CDM methodological tools. For description and justification of the baseline the following step by step approach used:

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

The baseline of this project is defined on special project basis in accordance with Article 21 of the JISC Guidance. Can not be used multi-project emission factor or sectoral baseline, because the project under consideration is one of the few of its kind, both in the sector (mining of rock dumps in Ukraine) as well as among JI projects.

According to Article 9 of the JISK Guidance, Option A selected for determining the baseline: *(a) An approach for determining the baseline and monitoring designed in accordance with Annex B of JI Guidelines (JI specific approach);*

Under Article 11 of Guidance for setting the baseline the latest version of the current methodology is used, which have chosen in the project " Slurry pond dismantling with the aim of decreasing the greenhouse gases emissions into the atmosphere. ", which is published on the website of the UNFCCC[8].

Taking in account JT-specific-approach for determing the baseline according to Article 24 of the JISC Guidance, the baseline is identified by a list and description of possible future scenarious based on conservative assumptions and choosing one of the most likely.

The most likely future scenarios will be identified by checking whether all alternatives meet the applicable law and regulations, and by analyzing the barriers. If only two alternatives remained, one of which represents the project scenario without the JI incentive, must be used Tools Clean Development Mechanism (CDM) "Tool for demonstration and assessment of additionality" to prove that the project scenario cannot be regarded as the most plausible.

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[6] http://unfccc.int/resource/docs/2005/cmp1/eng/08a02.pdf

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

[8] http://ji.unfccc.int/UserManagement/FileStorage/IE7LK2SZF1NOXRVB4CYG65WQPJMHA3

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
At present time slurry ponds are not utilized. Spontaneous self-heating and subsequent burning of slurry ponds are very common, measures to extinguish fire are taken sporadically. Burning technogenic deposits are sources of uncontrolled greenhouse gas emissions. Coal is not extracted from slurry ponds. Coal is produced by underground mines of the region and used for energy production or other purposes. Coal mining activities cause fugitive methane emissions and significant electricity consumption.

Scenario 2. Microbiological steam coal extraction from slurry ponds- waste products from enrichment plants
This method is based on the use of biological objects (bacteria and fungi) in the technological process and gives a possibility to extract additional amount of steam coal from slurry waste.[9]. Coal is used in energy sector. Lesser amount of coal is produced through mining.

Scenario 3. Slurry ponds exploitation with the aim of construction material production
Coal produced through mining is not substituted. Coal is produced by underground mines of the region and used for energy production or other purposes. Coal mining activities cause fugitive methane emissions and significant electricity consumption.

Scenario 4. Waste products utilization of coal benefication process to obtain steam coal without JI incentives.
This scenario is similar to the project activity, but in this case the project does not benefit from the possible development as a joint implementation project. In this scenario slurry ponds are processed in order to extract steam coal and used in the energy sector. Less coal is produced by underground mines of the region. Possibility of spontaneous slurry pond ignition is excluded.

Scenario 5. Systematic monitoring of slurry ponds condition and regular fire prevention and extinguishing measures

Slurry ponds are systematically monitored and their thermal condition is researched. Regular fire prevention measures are taken. In case of a burning slurry pond, the fire is extinguished and measures are taken to prevent burning in the future. Coal is not extracted from slurry ponds. Coal is produced by underground mines of the region and used for energy production or other purposes. Mining activities cause fugitive gas release and significant electricity consumption.

Sub step 2b. Consistency with mandatory applicable laws and regulations.

Due to existing Ukrainian laws and regulations treats, slurry ponds are considered as sources of possible dangerous emissions into the atmosphere. In general, burning slurry ponds should be extinguished and measures must be taken to prevent fires in the future. However, due to the large number of slurry ponds and their substantial sizes,combined with the limited resources of the owners, they typically do not even undertake the minimum required regular monitoring. Even after been informed about slurry pond burning, and measures have to be taken under existing legislation, it is more typical to accept the fine for air contamination, rather than take action to extinguish slurry pond burning itself.
Monitoring of slurry ponds condition is not conducted systematically, and all activities are at the discretion of the owner. Basically, slurry ponds are in ownership of enrichment plants; owners do not pay enough attention to extinguishing measures, mostly because of financial drawbacks. In this case slurry ponds are considered as an additional burden, but plants usually do not make even minimum measures required.

[9] http://masters.donntu.edu.ua/2012/igg/komarichev/library/izvlechenie.htm

In such circumstances, it is safe to say that all scenarios do not contradict existing laws and regulations.

Sub step 2c. Barrier analysis

Scenario 1. Continuation of existing situation

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

Scenario 2. Microbiological steam coal extraction from slurry ponds- waste products from enrichment plants

Technological barrier:Experimental studies have shown that, according to this method, additional coal amount may be obtained compared to traditional methods of waste products utilization after coal benefication process. However, this method is at the stage of research, besides the volume of waste products processing is much lesser compared to gravitational and other traditional methods.

Investment barrier: Investment into unproven technology carries a high risk. In case of Ukraine, which carries a high country risk, investment into such unproven energy projects is less likely to attract investors than other opportunities in the energy sector with higher returns.

Scenario 3. Slurry ponds exploitation with the aim of construction material production

Technological barrier: This scenario is based on known technology, however, this technology 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 slurry ponds as its content has to be predictable in order for project owner to be able to produce quality materials. High contents of sulphur and moisture can reduce the suitability of the slurry pond for processing. A large scale deep exploration of the slurry pond has to be performed before the project can start. As for today, these waste products are used for dams of slurry ponds filling.

Scenario 4. Waste products utilization of coal benefication process to obtain steam coal 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 slurry ponds condition and regular fire prevention and extinguishing measures

Investment barrier: This scenario does not represent any revenues, but anticipates additional costs for slurry pond owners. Monitoring of the slurry pond status is not done systematically and,in general, actions are left to the discretion of the individual owners. Slurry ponds are mostly owned by enrichment plants. They suffer from limited investment resulting often in safety problems due to complicated slurry ponds condition and financial constraints, with miner's salaries often being delayed by few months. Slurry ponds in this situation are considered as additional burdens and enrichment plants often do not even perform minimum required maintenance. Spontaneous self-heating and subsequent burning of slurry ponds are common, exact data are not always available. From a commercial point of view, the fines that are usually levied by the authorities are considerably lower than costs of all the measures outlined by this scenario.

Sub step 2d. Baseline identification

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

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

1) On a project specific basis. This project is the first of its kind and therefore other options could not be used;

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

3) Taking into account relevant national and/or sectoral policies and circumstances, such as sectoral reform initiatives, local fuel availability, power sector expansion plans, and the economic situation in the project sector. It is demonstrated by the above analysis that the baseline chosen clearly represents the most probable future scenario given the circumstances of modern day Donetsk coal sector;
4) Thus, emission reduction units (ERUs) cannot be earned for decreases in activity levels outside the project activity or due to force majeure. According to the proposed approach emission reductions will be earned only when project activity will generate coal from slurry ponds, so no emission reductions can be earned due to any changes outside of project activity.
5) Uncertainties and conservative assumptions were taken into account. A number of steps have to be taken in order to account for uncertainties and safeguard conservativeness:
a. Same approaches as used for the calculation of emission levels in the National Inventory Reports (NIRs) of Ukraine are used to calculate baseline and project emissions when possible. NIRs use the country specific approaches and country specific emission factors that are in line with default IPCC values;
b. Lower range of parameters is used for calculation of baseline emissions and higher range of parameters is used for calculation of project activity emissions;
c. Default values were used to the extent possible in order to reduce uncertainty and provide conservative data for emission calculations.

Baseline Emissions
In order to calculate baseline emissions the following assumptions were made:
1) The project exploits waste products of coal benefication; waste products contain steam coal that will replace coal of the same amount and type in the baseline scenario.Quality characteristics of coal concentrate produced in the project exceed the average coal characteristics obtained through mining (certificate of quality of coal concentrate will be provided by AIO); according to the principle of conservatism, this change is correct
2) The coal replaced in the baseline scenario, and the coal obtained during the project activities, is used for the same purposes and is stationery combusted;
3) The coal that is replaced in the baseline scenario is produced by the underground mines of the region and therefore causes fugitive methane emissions;
4) The technology of production coal in the mine involves using high electricity consumption (See Annex 5);
5) Coal production in mine is accompanied by consumption of other energy sources (gas, diesel, fuel oil), but their share compared to electricity is small[10];
6) Slurry pond of the region are vulnerable to spontaneous self-heating and burning and at some point in time will burn;
7) Probability of the slurry pond burning at any point in time is determined by scientific research of "Respirator"(See Annex 6);
8) Coal burning in the slurry pond will oxidize to CO_2 completely if allowed to burn uncontrolled.
9) Beneficated products are delivered to the consumer without significant accumulation on the intermediate storage,therefore, these methane emissions of enriched rocks can be neglected.
10)Sorted waste products of benefication have a low coal content and has no tendency to spontaneous ignition. Results of chemical analysis of the waste will be provided to the AIE.
Baseline emissions come from two major sources:
- Carbon dioxide emissions that occur during combustion of steam coal. These are calculated as stationery combustion emissions from mining coal in the equivalent of the amount of coal that is extracted from the slurry pond in the project scenario. These emissions in the baseline scenario is exactly equal to the same emissions in the project scenario, thus are excluded from the calculation;
- Carbon dioxide emissions from burning slurry pond. These emissions are calculated as emissions of carbon dioxide generated by burning slurry pond, the equivalent amount of coal extracted from the slurry pond in the project scenario, adjusted for the probability of slurry pond at any time;

[10] The effective method of electricity consumption control at coal mines. B.A.Gryaduschy, Doctor of Technical. Science, DonUGI, G.N.Lisovoy, V.I.Myalkovsky, Chehlaty NA, Cand. Science, NIIGM named M.M.Fedorov, Donetsk, Ukraine www.mishor.esco.co.ua/2005/Thesis/10.doc

As the baseline suggests that the current situation is preserved regarding slurry ponds burning, it is assumed that for any given slurry pond, actual burning will occur at some point in time. This probability of burning is established by the study[11].

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

Table 4 - List of constants in the calculation of baseline emissions

Data / Parameter	*Data unit*	*Description*	*Data Source*	*Value*
NCV_{Coal}	TJ/kt	Net Calorific Value of steam coal	National Inventory Report of Ukraine 1990- 2010,[12] p. 456,462,468 (during the monitoring period the value can be changed)	2008-21.5 2009-21.8 2010-21.6 2011-21.6 2012-21.6
$OXID_{Coal}$	d/l	Carbon Oxidation factor of steam coal	National Inventory Report of Ukraine 1990- 2010, p. 459, 465, 471(during the monitoring period the value can be changed)	2008-0.963 2009-0.963 2010-0.962 2011-0.962 2012-0.962
K^{c}_{coal}	tC/TJ	Carbon content of steam coal	National Inventory Report of Ukraine 1990- 2010, p. 458, 464, 470(during the monitoring period the value can be changed)	2008-25.95 2009-25.97 2010-25.99 2011-25.99 2012-25.99
p_{WHB}	d/l	Probability of slurry pond burning.	SRI report on mine rescue and fire safty “Respirator” 2012. “Report on the propensity for spontaneous ignition of coal benefication waste products of MEP “Slavianosebska”	0.73
p_{RB}	d/l	Probability of slurry pond burning out.	SRI report on mine rescue and fire safty “Respirator” 2012. “Report on the propensity for spontaneous ignition of coal benefication waste products of of MEP “Slavianosebska”	0.66

Emissions in the baseline scenario are calculated as follows:

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

where:

BE_y – baseline emissions in the year y (tCO_2 e),

$BE_{WHB,y}$ - baseline emissions due to burning of the slurry pond in the year y (tCO_2 e),

Baseline emissions due to burning slurry ponds in year y calculated by the formula:

$$BE_{WHB,y} = \frac{FC_{BE,Coal,y}}{1000} \cdot p_{WHB} \cdot p_{RB} \cdot NCV_{Coal} \cdot OXID_{Coal} \cdot K^{c}_{Coal} \cdot 44/12 \qquad (2)$$

where:

[11] SRI report on mine rescue and fire safty “Respirator” 2012. “Report on the propensity for spontaneous ignition of coal benefication waste products of enrichment plant “Shidno-Ukrainska Zbagachuvalna kompaniya”

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

$FC_{BE,Coal,y}$ - 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 slurry pond because of the project activity in the year *y*, t;
p_{WHB} - probability of the slurry pond burning , d/l;
p_{RB} – probability of the slurry pond burning out, d/l;
NCV_{Coal} - net Calorific Value of coal, TJ/kt;
$OXID_{Coal}$ - carbon Oxidation factor of coal, d/l;
K^{c}_{Coal} - carbon content of coal, tC/TJ;
1/1000 - conversion factor from tons in kilotonnes, d / l
44/12 - stoichiometric relationship between the molecular weight of carbon dioxide and carbon.

Leakages

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 and changes in carbon dioxide emissions associated with the additional electricity consumption due to mining.. 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 slurry ponds 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 are 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 slurry pond through the advanced beneficiation process. Therefore, coal produced by the project activity substitutes the coal that 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.
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 ACM0009[14] Version 03.2(Page 8). Activity data (in our case amount of coal obtained through waste products that come from slurry pond(enrichment process) is multiplied by the emission factor (which is sourced from the relevant national study – National Inventory Report of Ukraine under the Kyoto Protocol) and any conversion coefficients.
Electricity consumption and related greenhouse gas emissions due to slurry pond's waste products utilization to be taken into account as leakages in project emissions calculations on the basis of specific energy consumption calculations per tonne of coal concentrate that was obtained during slrry pond's waste products enrichment process. Carbon dioxide emissions due to electricity consumption in the coal mine way in an amount, equivalent to the design of coal - a leakage that can be taken into account at base of the State Statistics Committee data[15] concerning unit costs of electricity at coal mines in Ukraine in the relevant year.
This leakage is directly attributable to the JI project activity according to the following assumption: the coal produced by the project activity from theslurry pond 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 slurry pond. 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

[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://www.ukrstat.gov.ua/

specific green-house gas emissions) will substitute the baseline product (with higher associated specific green-house 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.

These leakages are significant and will be included in the calculation of the project emission reductions. Procedure for ex ante estimation and quantification of this source is similar to the procedure made in the project, that was determined – "Dismantling of waste heap at former mine "ROZSYPNYANSKA-1" (Project ITL UA1000317)[18] are given below:

Table 5 List of constants used in the calculations of leakage

Data / Parameter	***Data unit***	***Description***	***Data Source***	***Value***
GWP_{CH4}	tCO_2/ tCH_4	Global Warming Potential of Methane	IPCC Second Assessment Report[19]	21
ρ_{CH4}	t/m^3	Methane density	Standard (at room temperature 20°C and 1 ATM)[20]	0.000668
EF_{CH4}	m^3/t	Emission factor for fugitive methane emissions from coal mining.	National Inventory Report of Ukraine 1990- 2009,[21] p. 90 (On monitoring stage value can be changed)	25.67
$N^{E}_{Coal,\,y}$	MWh/t	average electricity consumption per tonne of coal, produced in Ukraine in the year y	Fuel and energy resources of Ukraine, Statistical Yearbook, State Statistics Committee of Ukraine, Kiev 2009-2011[22] (during monitoring period value can be changed)	2008 – 0.0878 2009 – 0.0905 2010 – 0.0926 2011 – 0.0842 2012 – 0.0842

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

19 *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

20 http://www.engineeringtoolbox.com/gas-density-d_158.html

21 http://unfccc.int/files/national_reports/annex_i_ghg_inventories/national_inventories_submissions/application/zip/ukr-2011-nir-08jun.zip

22 http://www.ukrstat.gov.ua/

$EF_{CO2,EL}$	tCO_2/MWh	Specific carbon dioxide emissions due to production of electricity at TPP and by its consumption	Order of State Environmental Investments Agency № 63, 43, 75 http://www.neia.gov.ua/nature/doccatalog/document?id=127171, 127172, 126006, 127498 (On monitoring stage value can be changed)	2008 – 1.219 2009 – 1.237 2010 – 1.225 2011 – 1.227 2012 – 1.227

Leakages in year y calculated as follows:

$$LE_y = LE_{CH4,y} + LE_{EL,y} \quad (3)$$

where:
LE_y - leakages in year y, (t CO_2e);
$LE_{CH4,y}$ – leakages due to fugitive emissions of methane in the mining activities in the year *y*, (t CO_2e);
$LE_{EL,y}$ - leakages due to consumption of electricity in the mining activities in the year y,(t CO_2e).
Leakages due to fugitive emissions of methane in the mining activities in the year y calculated as follows:

$$LE_{CH4,y} = -FC_{BE,Coal,y} \cdot EF_{CH4} \cdot \rho_{CH4} \cdot GWP_{CH4} \quad (4)$$

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 slurry pond because of the project activity in the year *y*, t;
EF_{CH4} - emission factor for fugitive methane emissions from coal mining, m^3/t;
ρ_{CH4} - methane density (standard, at room temperature 20 ˚ C and 1 atm), t/m^3;
GWP_{CH4} - global warming potential for methane , tCO_2 e / tCH_4.

Leakages due to consumption of electricity in the mining activities in the year y calculated as follows:

$$LE_{EL,y} = -FC_{BE,Coal,y} \cdot N^E_{Coal,y} \cdot EF_{CO2,EL,y} \quad (5)$$

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 slurry ponds because of the project activity in the year *y*, t
$N^E_{Coal,y}$ - average electricity consumption per tonne of coal, produced in Ukraine in the year y, MWh/t
$EF_{CO2,EL}$ - Specific carbon dioxide emissions due to production of electricity at TPP and by its consumption, tCO_2 e /MWh
Baseline emissions due to consumption of other types of energy in coal mines are insignificant compared to the emissions due to electricity consumption[23], so, due to this fact and for reasons of conservatism, take them equal to zero.

[23] *The effective method of electricity consumption control at coal mines. B.A.Gryaduschy, Doctor of Technical. Science, DonUGI, G.N.Lisovoy, V.I.Myalkovsky, Chehlaty NA, Cand. Science, NIIGM named M.M.Fedorov, Donetsk, Ukraine www.mishor.esco.co.ua/2005/Thesis/10.doc*

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

Table 6 - Amount of coal that has been mined in baseline scenario

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 slurry pond because of the project activity in year y
Time of determination/monitoring	Yearly monitoring.
Source of data (to be) used	Project owner calculations
Value of data applied (for ex ante calculations/determinations)	Provided by 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

Table 7 - Net Calorific Value of coal

Data/Parameter	NCV_{Coal}
Data unit	TJ/kt
Description	Net Calorific Value of coal
Time of determination/monitoring	Fixed ex ante.
Source of data (to be) used	National Inventory Report of Ukraine 1990- 2010., p. 458,462,468 (during the monitoring period the value can be changed)
Value of data applied (for ex ante calculations/determinations)	2008-21.5 2009-21.8 2010-21.6 2011-21.6 2012-21.6
Justification of the choice of data or description of measurement methods and procedures (to be) applied	The default value is set according to the National Inventory.
QA/QC procedures (to be) applied	According to the National Inventory.
Any comment	No

Table 8 - Carbon Oxidation factor of coal

Data/Parameter	$OXID_{Coal}$
Data unit	d/l
Description	Carbon Oxidation factor of coal
Time of determination/monitoring	Fixed ex ante.
Source of data (to be) used	National Inventory Report of Ukraine 1990- 2010., p. 459, 465, 471 (during the monitoring period the value can be changed)
Value of data applied (for ex ante calculations/determinations)	2008-0.963 2009-0.963 2010-0.962 2011-0.962 2012-0.962
Justification of the choice of data or description of measurement methods and procedures (to be) applied	The default value is set according to the National Inventory.
QA/QC procedures (to be) applied	According to the National Inventory.
Any comment	No

Table 9 - Carbon content of coal

Data/Parameter	K_{coal}^{c}
Data unit	tC/TJ
Description	Carbon content of coal
Time of determination/monitoring	Fixed ex ante.
Source of data (to be) used	National Inventory Report of Ukraine 1990- 2010., p. 458, 464, 470 (during the monitoring period the value can be changed)
Value of data applied (for ex ante calculations/determinations)	2008-25.95 2009-25.97 2010-25.99 2011-25.99 2012-25.99
Justification of the choice of data or description of measurement methods and procedures (to be) applied	The default value is set according to the National Inventory.
QA/QC procedures (to be) applied	According to the National Inventory.
Any comment	No

Table 10 - Probability of slurry pond burning.

Data/Parameter	p_{WHB}
Data unit	d/l
Description	Probability of the slurry pond burning.
Time of determination/monitoring	Fixed ex ante.
Source of data (to be) used	SRI report on mine rescue and fire safety “Respirator” 2012. “Report on the propensity for spontaneous ignition of coal benefication waste products of MEP“Slavianoserbska”. See Annex 6
Value of data applied (for ex ante calculations/determinations)	0.73
Justification of the choice of data or description of measurement methods and procedures (to be) applied	The default value is set according to the Scientific Research Institute “Respirator”
QA/QC procedures (to be) applied	According to the Scientific Research Institute “Respirator”
Any comment	No

Table 11 - Probability of slurry pond burning out.

Data/Parameter	p_{RB}
Data unit	d/l
Description	Probability of slurry pond burning out.
Time of determination/monitoring	Fixed ex ante.
Source of data (to be) used	SRI report on mine rescue and fire safety “Respirator” 2012. “Report on the propensity for spontaneous ignition of coal benefication waste products of MEP “Slavianoserbska”. See Annex 6
Value of data applied (for ex ante calculations/determinations)	0.66
Justification of the choice of data or description of measurement methods and procedures (to be) applied	The default value is set according to the Scientific Research Institute “Respirator”
QA/QC procedures (to be) applied	According to the Scientific Research Institute “Respirator”
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 JISC "Guidance on Criteria for Baseline Setting and Monitoring", Version 03", the approach to demonstrate additionality will consist of provision of traceable and transparent information that an accredited independent entity has already positively determined that a comparable project (to be) 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 a justification why this determination is relevant for the project at hand.

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 "WASTE HEAP DISMANTLING IN THE REBRYKOVE TOWN OF LUHANSK REGION OF UKRAINE WITH THE AIM OF REDUCING GREENHOUSE GASES EMISSIONS INTO THE ATMOSPHERE". (Project ITL UA1000392)[24] is selected as the comparable JI project. Accredited independent entity[25] 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

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 country in the same time period**: The proposed project and identified comparable project are both located in Ukraine. Time period between the start of two projects is less than 1 year therefore meets the criteria of Article 12 (b) "Guidance on Criteria for Baseline Setting and Monitoring ", Version 03.

3) Both projects utilize **similar technology:** The technology utilized by the proposed project and identified comparable project is similar. In both projects technogenic deposits are dismantled by standard loaders and bulldozers. The material from technogenic deposits is sent to the enrichment plant. Both projects use technologies in which the division of carbonaceous rock into enriched coal and waste occur. Enriched coal in both projects is used for subsequent combustion in local boiler and power station. Therefore, both technologies are similar.

4) Both projects have **similar scale**: Both projects are large scale JI projects. Both projects process technogenic deposits of comparable scale. The scale of extracted coal is limited by coal content and sizes

[24] http://ji.unfccc.int/JIITLProject/DB/XVX9ELI01AGMGKLB08FLJMB3K1X8MM/details

[25] http://ji.unfccc.int/UserManagement/FileStorage/HPGXM95LI7Y1NAETJRBF62W03DZOSQ

of technogenic deposits and similar to the proposed and comparable projects. In the proposed project the amount of obtained coal after enrichment process is about 113.000 tons per month of work, as in comparable project (see Section B.2. PDD).[26] Number of obtained emission reduction in both projects are similar for the comparable and proposed projects. In the proposed project obtained emission reduction resulting from the implementation of the project is 156,287 tonnes of CO2 equivalent for month of work, and in comparable project – 145.157 tonnes of CO2 equivalent (see Table 12). Thus the average amount of processing in both projects does not differ by more than 50% and meets the requirements of Guidance.

Table 12 - Emission reductions due to the project implementation in the proposed and comparable projects.

	2008	2009	2010	2011	2012
Emission reductions due to the project implementation in the proposed project, (t CO2 equivalent)	341 390	1 904 893	1 907 901	1 902 408	1 914 042
Emission reductions due to the project implementation in the comparable project, (t CO2 equivalent)	111 134	1 817 039	1 597 586	1 762 148	1 824 782
The ratio of emission reductions generated by the project implementation in both projects (d/l)	3.07*	1.05	1.19	1.08	1.05

* The proposed project started two months earlier than comparable project.

5) During the period between the beginning of the proposed and the compared projects changes in legislation that could affect the establishment of the baseline didn't take place.

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 project "WASTE HEAP DISMANTLING IN THE REBRYKOVE TOWN OF LUHANSK REGION OF UKRAINE WITH THE AIM OF REDUCING GREENHOUSE GASES EMISSIONS INTO THE ATMOSPHERE". (Project ITL UA1000392) 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: Kyoto period (2008-2012) is a period where a most extensive work in both projects is carried out.

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[27] 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. In general, prices of state mines are more than 60% higher than the prices for private enterprises[28].

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.

[26] http://ji.unfccc.int/UserManagement/FileStorage/HPGXM95LI7Y1NAETJRBF62W03DZOSQ

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

[28] http://www.ier.com.ua/files/publications/Policy_papers/German_advisory_group/2009/PP_09_2009_ukr.pdf

Table 13 - International ratings of Ukraine[29]

Organization, which provides rating	Name of rating	Ukraine's place in the rating	Number of countries in the rating
Fung Heritage (2010)	Economic Freedom Rating	162	179
Pro UN (2009)	The Human Development Index	85	182
Transparency International (2009)	Index of corruption	146	180
Freedom House (2009)	freedom of Speech	115	195
World Bank, The International Finance Corporation and the Audit Company Price Waterhouse Coopers (2010)	Rating of ease of paying taxes	181	183
World Economic Forum (Davos) (2009-2010)	Rating of global competitiveness	82	133
World Economic Forum (Davos) (2009)	Financial strength rating	55	55
"Alliance for Property Rights" (USA)	Rating of property rights protection	58	70

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:

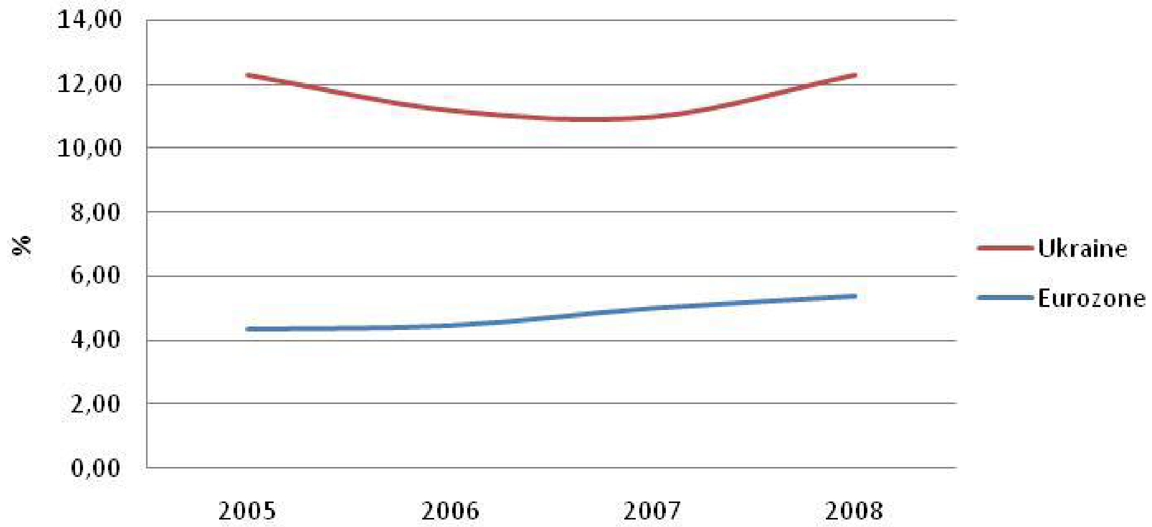

Figure 4 - Commercial lending rates, EUR, over 4 years[30]

Cost of debt financing in Ukraine is at least twice as high than 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[31]:

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[29] http://sd.net.ua/2010/06/11/ukraine_ratings.html

[30] Data for Ukraine from National Bank of Ukraine http://www.bank.gov.ua/Statist/Electronic%20bulletin/data/4-Financial%20markets(4.1).xls

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

Table 14 - Sovereign Awards for Russia and Ukraine in 2004-2006

Total Risk Premium, %	2004	2005	2006
Russia	7.02	6.6	6.64
Ukraine	11.59	10.8	10.16

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[32]. 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 "WASTE HEAP DISMANTLING IN THE REBRYKOVE TOWN OF LUHANSK REGION OF UKRAINE WITH THE AIM OF REDUCING GREENHOUSE GASES EMISSIONS INTO THE ATMOSPHERE". (Project ITL UA1000392) 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 "Dismantling of waste heap at former mine "WASTE HEAP DISMANTLING IN THE REBRYKOVE TOWN OF LUHANSK REGION OF UKRAINE WITH THE AIM OF REDUCING GREENHOUSE GASES EMISSIONS INTO THE ATMOSPHERE". (Project ITL UA1000392) 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:

Project implementation will take place only on the slurry pond, which officially in use by PE "SPETSMONTAZH FC" At the same time, according to the baseline, a typical mine, which produces coal and causes leakages, replaced by coal obtained from dismantling of the slurry pond. The specific energy consumption of coal mining enterprises is determined by the following main components: power consumption, heat consumption, air consumption, natural gas consumption and other types of fuel and water, sewage discharges, sewage treatment. As a result of work[33] is found, that about 90% of the total energy consumption at coal mines is electricity.

[32] 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

[33] The effective method of electricity consumption control at coal mines. B.A.Gryaduschy, Doctor of Technical. Science, DonUGI, G.N.Lisovoy, V.I.Myalkovsky, Chehlaty NA, Cand. Science, NIIGM named M.M.Fedorov, Donetsk, Ukraine www.mishor.esco.co.ua/2005/Thesis/10.doc

There are several sources of greenhouse gases due to mining:
- Uncontrolled methane emissions as a result of work of the coal industry in Ukraine;
- Carbon dioxide emissions due to electricity consumption at the mine;
- Carbon dioxide emissions due to consumption of other types of fuel at the mine (given the small number and for reasons of conservatism is not considered);

Carbon dioxide emissions due to consumption of electricity produced by burning fossil fuels in power plants of Ukraine and uncontrolled methane emissions as a result of mining activity, are leakages .

The table 15 shows an overview of all sources of emissions in the baseline and project scenarios. The project boundaries depicted in accordance with the provisions of Articles 14, 16, 17 Guidelines Supervisory Committee.

Table 15 - Sources of emissions in the baseline and project scenario.

Baseline scenario	**Source**	**Gas**	**Included/ Excluded**	**Justification / Explanation**
	Slurry pond burning	CO_2	Included	Main emission source
	Coal consumption	CO_2	Excluded	This coal is displaced in the project activity by the coal extracted from the slurry pond
Project scenario	Coal consumption	CO_2	Excluded	The coal obtained during slurry processing
	Consumption of fossil fuel (diesel fuel) due to slurry extraction from the slurry pond	CO_2	Included	Main emission source.
Leakages	Emissions of methane as a result of the coal industry	CH_4	Included	These leaks are taking place in the baseline scenario associated with the uncontrolled leakage of methane in the mine
	Consumption of electricity due to mining	CO_2	Included	Leakages due to baseline activity
	Use of other types of energy resources due to mining	CO_2	Excluded	These emissions are not significant[34], and also for reasons of conservatism, they are excluded from consideration.
	Consumption of electricity due to benefication of coal from slurry pond	CO_2	Included	Leakages due to project activity

The baseline scenario

The baseline scenario is the continuation of the current situation. Coal is mined in underground mines, which causes uncontrolled methane emissions. Electricity and other fuels are consumed during coal extraction. Coal is used for energy production. Slurry ponds heat and often ignite resulting in emissions of carbon dioxide in the atmosphere. The sources of emissions in the baseline scenario are:
-Emissions of carbon dioxide due to consumption of coal for energy production (identical in baseline and project scenario);
-Emissions of carbon dioxide due to burning of slurry ponds;

Project scenario

By the project scenario slurry ponds are dismantled and all combustible materials are removed. Thus, emissions due to ignition and burning slurry ponds are reduced. Project implementation includes additional

[34] The effective method of electricity consumption control at coal mines. B.A.Gryaduschy, Doctor of Technical. Science, DonUGI, G.N.Lisovoy, V.I.Myalkovsky, Chehlaty NA, Cand. Science, NIIGM named M.M.Fedorov, Donetsk, Ukraine www.mishor.esco.co.ua/2005/Thesis/10.doc

diesel fuel burning due to carbonaceous waste products supply to the enrichment plant. For operation of the equipment the electricity is used. Additional amount of coal obtained from the project, reduced the need for its production in the mines. The sources of emissions in the project scenario are:
-Emissions of carbon dioxide from the use of fuel for the operation of the project equipment (technics);
-Emissions of carbon dioxide from the consumption of coal for energy production (identical in baseline and project scenario).

Leakages:
The sources of leakages are:
-Uncontrolled methane emissions due to coal mining in the mines;
-Emissions of carbon dioxide due to consumption of electricity and other forms of energy in coal mining in the mine.
-Emissions of carbon dioxide associated with electricity consumption at benefication plant for receiving the coal concentrate from carbonaceous waste of the slurry pond
The following figures show the project boundaries and sources of emissions in the baseline and project scenarios:

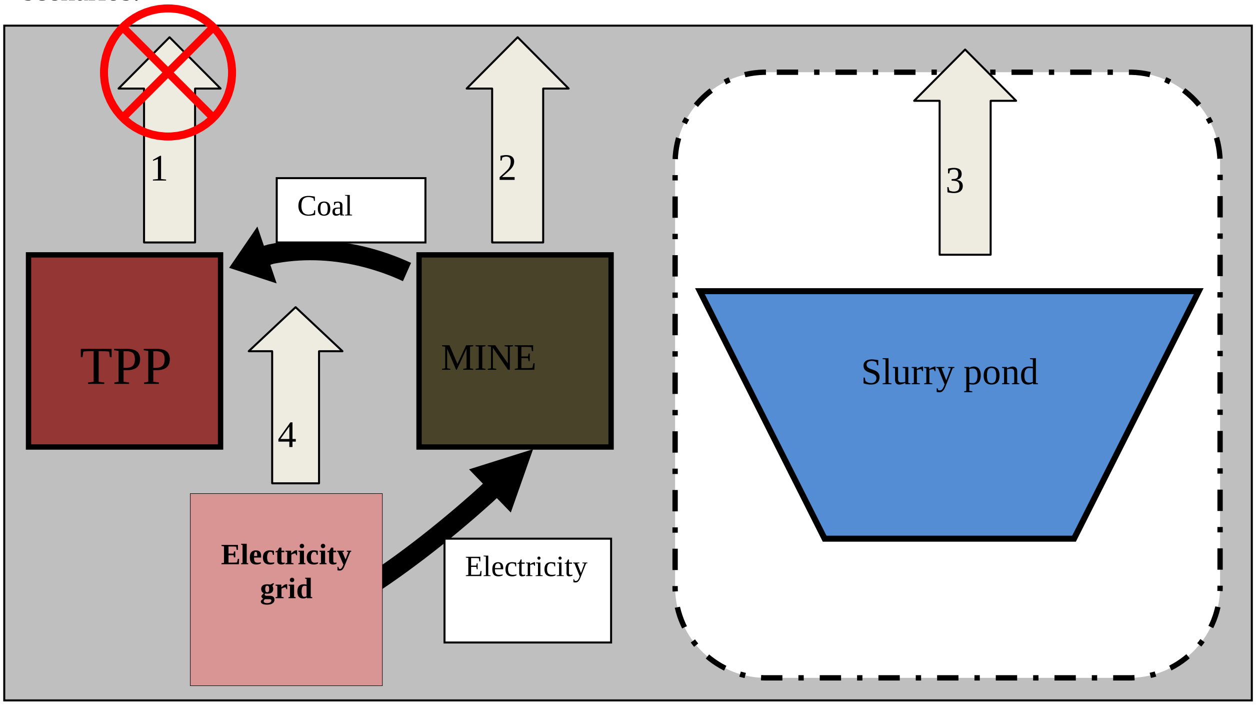


Figure 6 - The boundaries of the project and the sources of emissions in the baseline scenario

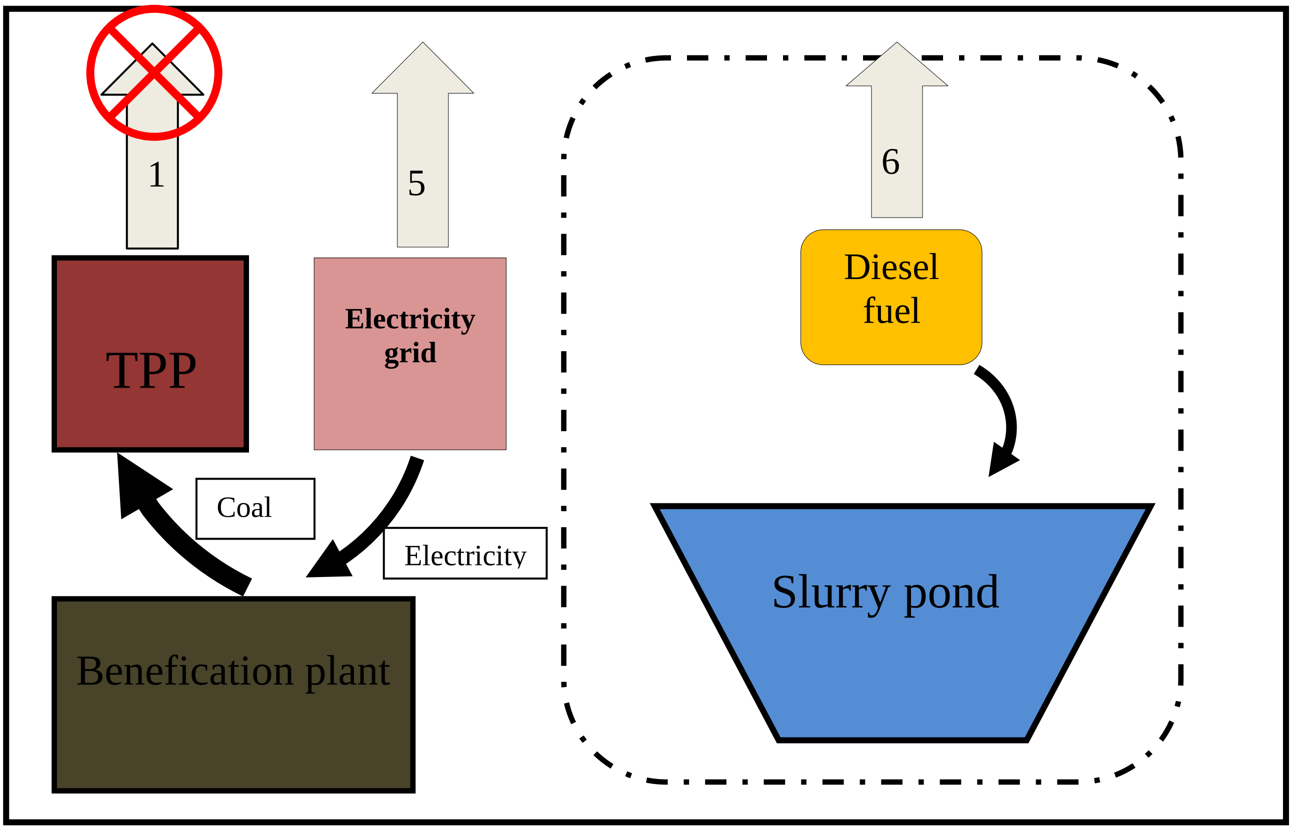
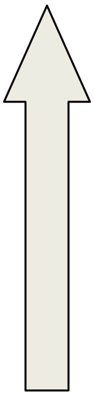


Figure 7 - The boundaries of the project and the source of emissions in the project scenario

Sources of greenhouse gas emissions at schemes



1. Carbon dioxide due to burning of coal

2.Leakages of methane due to mining

3.Carbon dioxide due to burning of slurry pond

4. Carbon dioxide due to electricity consumption from the grid during during mining

5.Carbon dioxide due to electricity consumption from the grid during beneficiation process

6. Carbon dioxide due to diesel fuel burning during technique operation


Emissions due to burning of coal excluded from consideration

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 determination the basline scenario: 03/09/2012
Name of person / organization, determining the baseline scenario:
Gints Klavinsh, Project manager at SIA "Vidzeme EKO", tel: .+371-29228458, e-mail: siltisilti@gmail.lv
"Vidzeme Eko" – project participant , contact details are available in Annex 1.

SECTION C. Duration of the project / crediting period

C.1. Starting date of the project:

The date of the project commencement is 01/10/2008. From this date the slurry pond dismantling starts according to the work Order # 4 from 01/10/2008.

C.2. Expected operational lifetime of the project:

The life cycle of the project will last from 01/10/2008 to 31/12/2012. Therefore, the life cycle of the project is 6 years, 3 months or 75 months.

C.3. Length of the crediting period:

Lengs of the crediting period - from 01/10/2008 to 31/12/2012. On 01/10/2008 generation of first emission reductions in the project begins. Emission Reduction Units received after the crediting period can be used in accordance with an appropriate mechanism under the UNFCCC. Crediting period can be extended, if it is approved by host Party.Taking into consideration such possible extension, the duration of the crediting period with the start date on 01/10/2008 will be 6 years 3 months or 75 months

SECTION D. Monitoring plan

D.1. Description of monitoring plan chosen:

The proposed monitoring procedures coincide with standard procedures in projects that were determined: Limited Society “Anthracite”, “Monolith” Ltd., “Temp” Ltd and others. The project’s developer is Global Carbon BV.
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 for realizing of monitoring.

Option *a* provided by the Guidelines For The Users Of The Joint Implementation Project Design Document Form, Version 04[35] is used: JI specific approach is used in this project and therefore will be used for establishment of monitoring plan.
Among other things, the monitoring plan includes the following:
- Collecting and archiving all relevant data needed for evaluation and measurement of anthropogenic emissions by sources of emissions that occur within the project during the crediting period;
- Collecting and archiving all relevant data necessary for determining the baseline of anthropogenic emissions by sources of GHGs within the project during the crediting period;
- Identify all potential sources and collect and archive data regarding the enhancement the level of anthropogenic emissions by sources of emissions outside the project, which is significant and which can be attributed to the project during the crediting period.
- Procedures to ensure quality control and process monitoring;
- Procedures for periodic calculation reductions of anthropogenic emissions from sources in the proposed JI project, and procedures for calculating the effects of leakage, if any.

Step 2. Application of the approach chosen.

All data collected during monitoring should be archived and stored for at least 2 years after the last application for ERU.
These should be checked, unless otherwise indicated in the following sections. All measurements must be executed with calibrated measurement equipment according to industry standards for the branch.

Baseline scenario

The baseline scenario is the continuation of the current situation. Coal is mined in underground mines, which causes uncontrolled methane emissions. Due to mining the electricity and other types of fuel are consumed. Coal is used for energy production. A new dump formed In the process of coal mining. Dumps are heated and often are ignited, resulting in emissions of carbon dioxide in the atmosphere. The sources of emissions in the baseline scenario are:
-Emissions of carbon dioxide due to coal consumption for energy production;

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

-Emissions of carbon dioxide due to burning of slurry pond;
The sources of leakages in the baseline scenario are:
Uncontrolled methane emissions due to coal mining in the mines;
-Emissions of carbon dioxide due to consumption of electricity and other forms of energy in coal mining in the mine.

Project scenario

In the project scenario slurry pond is dismantled, and all combustible materials are removed. Thus, emissions due to ignition and slurry pond burning are reduced. Project implementation includes additional burning diesel fuel to supply the mining of rock dumps to the point of benefication of coal. The electricity is used for operation of the equipment of benefication plant. Additional coal obtained from the project, reducing the need for its production in the mines. The sources of emissions in the project scenario are:

- Emissions of carbon dioxide due to consumption of fuel for the operation of the project equipment (mining machinery);
- Emissions of carbon dioxide due to use of coal, that is extracted from the slurry pond for the energy production (equal to the emissions from the combustion of an equivalent amount of coal produced at the mine in the baseline, so they are excluded from the calculation in both scenarios)

The sources of leakages in the project scenario are:
-Emissions of carbon dioxide associated with electricity consumption at benefication plant for receiving the coal concentrate from carbonaceous waste of the slurry pond
During any period of monitoring should be collected and register data on the following parameters

1. Amount of diesel fuel consumed in the appropriate period as a result of a project activity.

To determine this parameter the commercial data of company are used. To confirm the consumed amount of fuel checks and other accounting documents are used. The fuel consumption, which is related to a project activity, is taken into account. Information summary report is based on accounts .In the industrial site there is not any additional equipment, but if such equipment is used, fuel consumption of this equipment is also considered. If the data in these documents are in litres instead of tonnes, these data must be converted using factor of 0.85 kg / l[36]. For purpose of control a theoretical calculation of diesel fuel consumption is made on basis of technical specifications and actual record of machinery work.

2. Amount of coal, which is in the appropriate period was extracted from the slurry pond and combusted for obtaining the energy, used for activities under the project, equal to the amount of coal that was in the baseline scenario produced from the mine and combusted for obtaining the energy.

To determine this parameter the commercial data of company are used. To confirm the amount of coal checks and documents from customers are used. Taken into account and refers to the project activity only product which delivered to the customer. Weighing takes place on site using certified scales. Regular cross-inspections with customers are executed. Information of summarized reports is based on these delivery data.

[36] http://elarum.ru/info/standards/gost-305-82/

Measuring devices

The method of measurement, chosen for this project, is based on the measurement of some parameters to be monitored - enriched coal and the study of accounting documents and reports on other parameters (used fuel). For measuring procedures in the project the following equipment is used:

- electronic automobile scales VTA-60, produced by " Ukrestmarkinvest " Ltd. accuracy "Medium" (III) (measurement error with standard truck load of + / - 0.25%) frequency of testing 12 months;

Archiving, data storage and record handling procedure

Documents and reports on the data that are monitored will be archived and stored by the project participants. The following documents will be stored: primary documents for the accounting of monitored parameters in paper form; intermediate reports, orders and other monitoring documents in paper and electronic form; documents on measurement devices in paper and electronic form. These documents and other data monitored and required for determination and verification, as well as any other data that are relevant to the operation of the project will be kept for at least two years after the last transfer of ERUs. Officials responsible for information storage (according to the director (PE “SPETSMONTAZH FC”) Order # 32/08 from 02/10/2008) - production manager and chief accountant of PE “SPETSMONTAZH FC”.

Training of monitoring personnel

The project will utilize technology that requires skills and knowledge in heavy machinery operation, coal washing technology operation, electric equipment operation etc. This kind of skills and knowledge are available locally through the system of vocational training and education. This system is state-supervised in Ukraine. Professionals who graduate from vocational schools receive a standard certificate in the field of their professional study. Only workers with proper training can be allowed to operate industrial equipment like. Management of the project host will ensure that personnel of the project have received proper training and are eligible to work with the prescribed equipment.

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

Activities that are directly related to the monitoring do not require specific training other than provided by the professional education. However, monitoring personnel will receive training on monitoring procedures and requirements. Personnel of the project host management will receive necessary training and consultations on Kyoto Protocol, JI projects and monitoring from the project participant - SIA “Vidzeme Eko”.

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

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

The project host management will also establish a communication channel that will make it possible to submit suggestions, improvement proposals and project ideas for more accurate future monitoring for every person involved in the monitoring activities. These actions occur through close cooperation with SIA "VidzemeEko", external consultant PE “SPETSMONTAZH FC” on JI projects.

Emergency preparedness for cases where emergencies can cause unintended emissions

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

Table 16 - List of constants used in the calculations of emissions

Data / Parameter	***Data unit***	***Description***	***Data Source***	***Value***
GWP_{CH_4}	tCO_2/ tCH_4	Global Warming Potential of Methane	IPCC Second Assessment Report	21
ρ_{CH_4}	t/m^3	Methane density	Standard (at room temperature 20°C and 1 ATM)	0.000668
NCV_{Coal}	TJ/kt	Net Calorific Value of coal	National Inventory Report of Ukraine 1990- 2010., p. 456, 462, 468	2008-21.5 2009-21.8 2010-21.6 2011-21.6 2012-21.6
NCV_{Diesel}	TJ/kt	Net Calorific Value of diesel fuel	National Inventory Report of Ukraine 1990- 2010., p. 473,476, 479	2008-42.2 2009-42.3 2010-42.5 2011-42.5 2012-42.5
$OXID_{Coal}$	d/l	Carbon Oxidation factor of coal	National Inventory Report of Ukraine 1990- 2010, p. 459, 465, 471	2008-0.963 2009-0.963 2010-0.962 2011-0.962 2012-0.962
$OXID_{Diesel}$	d/l	Carbon Oxidation factor of diesel fuel	National Inventory Report of Ukraine 1990- 2010, p. 475, 478, 481	2008-0.99 2009-0.99 2010-0.99 2011-0.99 2012-0.99
K_{coal}^{c}	tC/TJ	Carbon content of coal	National Inventory Report of Ukraine 1990- 2010, p. 458,464, 470	2008-25.95 2009-25.97

				2010-25.99 2011-25.99 2012-25.99
K^{c}_{Diesel}	tC/TJ	Carbon content of diesel fuel	National Inventory Report of Ukraine 1990- 2010, p. 474, 477, 480	2008-20.2 2009-20.2 2010-20.2 2011-20.2 2012-20.2
EF_{CH4}	m^3/t	Emission factor for fugitive methane emissions from coal mining.	National Inventory Report of Ukraine 1990- 2009, p. 90	25.67
$EF_{CO2,EL}$	tCO_2/MWh	Specific carbon dioxide emissions due to production of electricity at TPP and by its consumption	Order of State Environmental Investments Agency № 63, 43, 75 http://www.neia.gov.ua/nature/doccatalog/document?id=127171, 127172, 126006, 127498	2008 – 1.219 2009 – 1.237 2010 – 1.225 2011 – 1.227 2012 – 1.227
p_{WHB}	d/l	Probability of slurry pond burning.	SRI report on mine rescue and fire safety “Respirator” 2012. “Report on the propensity for spontaneous ignition of coal benefication waste products of MEP “Slavianoserbska”	0.73
p_{RB}	d/l	Probability of slurry pond burning out.	SRI report on mine rescue and fire safety “Respirator” 2012. “Report on the propensity for spontaneous ignition of coal benefication waste products of MEP “Slavianoserbska”	0.66
$N^{E}_{B,Coal,y}$	MWh/t	Average electricity consumption per tonne of coal, produced in Ukraine in year.	Fuel and energy resources of Ukraine, Statistical Yearbook, State Statistics Committee of Ukraine, Kiev, 2009-2011.	2008 – 0.0878 2009 – 0.0905 2010 – 0.0926 2011 – 0.0842 2012 – 0.0842
$N^{E}_{P,Coal,y}$	MWh/t	Average electricity consumption per tonne of enriched coal at the enrichment plant in the year y	Electricity consumption calculations due to the technology of the rocks processing at the enrichment plant (see Appendix 4)	0.011

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**
P1	$FC_{PE,Diesel,y}$ – Amount of diesel fuel consumed in project in year y	Company records	t	*C*	Monthly	100%	In paper and electronic form	
P2	NCV_{Diesel} – Net Calorific Value of diesel fuel	See section D.1. Fixed ex ante	TJ/kt	*E*	Fixed ex ante	100%	In electronic form	
P3	$OXID_{Diesel}$ - Carbon Oxidation factor of diesel fuel	See section D.1. Fixed ex ante	d/l	*E*	Fixed ex ante	100%	In electronic form	
P4	K^{c}_{Diesel} - Carbon content of diesel fuel	See section D.1. Fixed ex ante	tC/TJ	*E*	Fixed ex ante	100%	In electronic form	

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:

$$PE_y = PE_{Diesel,,y} \tag{6}$$

where:
PE_y - project emissions due to project activity in the year *y* (tCO_2 equivalent),
$PE_{Diesel,,y}$ - project emissions due to consumption of diesel fuel by the project activity in the year *y* (tCO_2 equivalent).

Project emissions due to consumption of diesel fuel by the project activity in the year y are calculated as follows:

$$PE_{Diesel,y} = \frac{FC_{PE,Diesel,y}}{1000} \cdot NCV_{Diesel} \cdot OXID_{Diesel} \cdot K^c_{Diesel} \cdot 44/12\ , \tag{7}$$

where:
$FC_{PE,Diesel,y}$ - amount of diesel fuel, consumed in project in year y, t;
NCV_{Diesel} - Net Calorific Value of diesel fuel, TJ/kt;
$OXID_{Diesel}$ - carbon Oxidation factor of diesel fuel, d/l;
K^c_{Diesel} - carbon content of diesel, tC/TJ;
44/12 - stoichiometric relationship between the molecular weight of carbon dioxide and carbon.
1/1000 - conversion factor from tons in kilotonnes, d / l

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**
B1	$FC_{BE,Coal,y}$ - Amount of coal that has been mined in the baseline scenario and combusted for energy use in year y	Company records	t	*M*	Monthly	100%	In paper and electronic form	Equil $FC_{PE,Coal,y}$ Calculated using formula (2)
B2	NCV_{Coal} - Net Calorific Value of coal	Company records	TJ/kt	*C*	Fixed ex ante	100%	In paper and electronic form	Calculated using formula (14)
B3	$OXID_{Coal}$ - Carbon Oxidation factor of coal	See section D.1. Fixed ex ante	d/l	*C*	Fixed ex ante	100%	In electronic form	
B4	K^{c}_{coal} - Carbon content of coal	See section D.1. Fixed ex ante	tC/TJ	*C*	Fixed ex ante	100%	In electronic form	
B5	p_{WHB} - Probability of slurry pond burning	See section D.1. Fixed ex ante	d/l	*C*	Fixed ex ante	100%	In electronic form	

B6	p_{RB} –Probability of slurry pond burning out	See section D.1. Fixed ex ante	d/l	*C*	Fixed ex ante	100%	In electronic form	

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:

$$BE_y = BE_{WHB,y} \quad , \tag{8}$$

Where:

BE_y – baseline emissions in the year *y* (tCO_2 equivalent),

$BE_{WHB,y}$ - baseline emissions due to burning of the slurry pond in the year *y* (tCO_2 equivalent),

Baseline emissions due to burning dumps in year y calculated by the formula:

$$BE_{WHB,y} = \frac{FC_{BE,Coal,y}}{1000} \cdot p_{WHB} \cdot p_{RB} \cdot NCV_{Coal} \cdot OXID_{Coal} \cdot K^{c}_{Coal} \cdot 44/12 \tag{11}$$

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 slurry pond because of the project activity in the year *y*, t;

p_{WHB} - probability of slurry pond burning , d/l;

p_{RB} – probability of the slurry pond burning out, d/l;

NCV_{Coal} - net Calorific Value of coal, TJ/kt;

$OXID_{Coal}$ - carbon Oxidation factor of coal, d/l;

K^{c}_{Coal} - carbon content of coal, tC/TJ;

1/1000 - conversion factor from tons in kilotonnes, d / l

44/12 - stoichiometric relationship between the molecular weight of carbon dioxide and carbon.

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

This section is left blank on purpose

D.1.2.1. Data to be collected in order to monitor emission reductions from the project, and how these data will be archived:

ID number *(Please use numbers to ease cross-referencing to D.2.)*	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment

This section is left blank on purpose

D.1.2.2. Description of formulae used to calculate emission reductions from the project (for each gas, source etc.; emissions/emission reductions in units of CO_2 equivalent):

This section is left blank on purpose

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

The result of this project is the net change (reduction) of uncontrolled methane emissions due to of mining activity. As in the baseline scenario the supplying of coal is solely from mine, it leads to uncontrolled methane emissions. These emissions are calculated by applying the default emission factor for the country to the amount of coal extracted from the slurry pond in the project scenario (which is the same amount of coal extracted from mines in the baseline scenario). Carbon dioxide emissions due to electricity consumption in the coal mine way in an amount equivalent to the project amount of coal - a leakage, that can be taken into account at the base of State Statistics Committee[37] data on specific consumption of electricity at coal mines in Ukraine in the relevant year. Carbon dioxide emissions due to electricity consumption due to benefication of coal at benefication factory in the project scenario - a leakage that is considered on the base of standard calculation of specific energy consumption in the technological process of benefication.
These leakages are significant and will be included in the monitoring plan and calculating emission reductions for the project.

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

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
B1	$FC_{BE,Coal,y}$ - Amount of coal that has been mined in the baseline scenario and combusted for energy use in year y	Company records	t	*M*	Monthly	100%	In paper and electronic form	Equal to amount of coal extracted from dump. To measure this parameter using commercial data. Amount of coal confirmed by acts of acceptance from customers.
L1	$EF_{CO2,EL}$ - Specific carbon dioxide emissions due to production of electricity at TPP and by its consumption	See section D.1. Fixed ex ante	tC/MWh	*E*	Fixed ex ante	100%	In electronic form	
L2	GWP_{CH4} - Global Warming Potential of Methane	See section D.1. Fixed ex ante	tCO_2/ tCH_4	*E*	Fixed ex ante	100%	In electronic form	

L3	EF_{CH_4} - Emission factor for fugitive methane emissions from coal mining.	See section D.1. Fixed ex ante	m^3/t	*E*	Fixed ex ante	100%	In electronic form	
L4	ρ_{CH4} - Methane density at standart conditions	See section D.1. Fixed ex ante	t/m^3	*E*	Fixed ex ante	100%	In electronic form	
L5	$N^{E}_{Coal,y}$ Average electricity consumption per tonne of extracted coal in Ukraine in year y	See section D.1. Fixed ex ante	MWh/t	*C*	Fixed ex ante	100%	In electronic form	

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:

$$LE_y = LE_{B,y} + LE_{P,y} \quad (10)$$

де:
LE_y - leakages in year y, (t CO_2e);
$LE_{B,y}$ – leakages in the baseline scenario in the year *y*, (t CO_2e);
$LE_{P,y}$ - leakages in the project scenario in the year *y*, (t CO_2e);

Leakages in baseline scenario year y are calculated as follows:

$$LE_{B,y} = LE_{CH4,y} + LE_{B,EL,y} \quad (11)$$

де:

$LE_{B,y}$ - leakages in year y, (т CO_2e);
$LE_{CH4,y}$ - leakages due to fugitive emissions of methane in the mining activities in the year *y*, (t CO_2e);
$LE_{B,EL,y}$ - leakages due to consumption of electricity from a grid at coal mine in a year y,(t CO_2e);

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

$$LE_{CH4,y} = -FC_{BE,Coal,y} \cdot EF_{CH4} \cdot \rho_{CH4} \cdot GWP_{CH4} \qquad (12)$$

де:
$LE_{CH4,y}$ - leakages due to fugitive emissions of methane in the mining activities in the year *y*, (t CO_2e);
$FC_{BE,Coal,y}$ - 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 because of the project activity in the year *y*, t;
EF_{CH4} - emission factor for fugitive methane emissions from coal mining., $м^3$/t;
ρ_{CH4} - methane density at standart conditions t/$м^3$;
GWP_{CH4} - Global Warming Potential of Methane , tCO_2/ tCH_4.

Leakages due to consumption of electricity from a grid at coal mine in a year y are calculated as follows:

$$LE_{B,EL,y} = -FC_{BE,Coal,y} \cdot N^{E}_{B,Coal,y} \cdot EF_{CO2,EL,y} \qquad (13)$$

де:
$LE_{B,EL,y}$ - leakages due to consumption of electricity from a grid at coal mine in a year y, (t CO_2e);
$FC_{BE,Coal,y}$ - 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 slurry pond because of the project activity in the year *y*, t;
$N^{E}_{B,Coal,y}$ - Average electricity consumption per tonne of coal, produced in Ukraine in the year y, MWh/t;
$EF_{CO2,EL}$ - Specific carbon dioxide emissions due to production of electricity at TPP and by its consumption, tCO_2/ MWh.

Leakages due to consumption of other types of energy in coal mines are the minor in comparison to the leakages due to electricity consumption[38], so in connection with this, and for reasons of conservatism, take them equal to zero.
Leakages in baseline scenario year y are calculated as follows:

$$LE_{P,y} = LE_{P,EL,y} \qquad (14)$$

where:

[38] The effective method of electricity consumption control at coal mines. B.A.Gryaduschy, Doctor of Technical. Science, DonUGI, G.N.Lisovoy, V.I.Myalkovsky, Chehlaty NA, Cand. Science, NIIGM named M.M.Fedorov, Donetsk, Ukraine www.mishor.esco.co.ua/2005/Thesis/10.doc

$LE_{P,EL,y}$ - leakages due to consumption of electricity from a grid at benefication plant in a year y,(t CO_2e).
leakages due to consumption of electricity from a grid at benefication plant in a year y are calculated as follows:

$$LE_{P,EL,y} = FC_{BE,Coal,y} \cdot N^E_{P,Coal,y} \cdot EF_{CO2,EL}; \qquad (15)$$

where:
$FC_{BE,Coal,y}$ - the amount of coal mined in the baseline scenario and combusted for energy use, equivalent to the amount of coal extracted from the slurry pond because of the project activity in the year *y*, t;
$N^E_{P,Coal,y}$ - average electricity consumption per tonne of coal for the processing technology of rock on the benefication plant;
$EF_{CO2,EL}$ - specific carbon dioxide emissions due to production of electricity at TPP and by its consumption, tCO_2/ MWh.

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

The annual emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y - LE_y, \qquad (16)$$

Where:
ER_y - emissions reductions of the JI project in year y (tCO_2 equivalent);
BE_y - baseline Emission in year y (tCO_2 equivalent);
PE_y - project Emission in year y (tCO_2 equivalent).
LE_y - leakages in year y, (tCO_2 equivalent)

D.1.5. Where applicable, in accordance with procedures as required by the host Party, information on the collection and archiving of information on the environmental impacts of the project:

Collection and archiving of the information on the environmental impacts of the project will be done based on the approved EIA in accordance with the Host Party legislation - *State Construction Standard DBN A.2.2.-1-2003 :"Structure and Contents of the Environmental Impact Assessment Report (EIR) for Designing and Construction of Production Facilities, Buildings and Structures"*[39] State Committee Of Ukraine On Construction And Architecture, 2004 (see Section F.1).

[39] http://document.ua/proektuvannja.-sklad-i-zmist-materialiv-ocinki-vplivіv-na-na-nor3146.html

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.
B1	Low	These data are used in commercial activities of the company. The weights will be calibrated according to the procedures of the Host Party. Calibration interval is 1 year.
B2-B4	Low	These data are fixed values and standard constants taken from regular sources
B5	Medium	These data are fixed values and standard constants taken from regular sources
P1	Low	This data are used in the commercial activity of the company. Accounting documentation will be used.
P2-P4	Low	These data are fixed values and standard constants taken from regular sources
L1-L5	Low	These data are fixed values and standard constants taken from regular sources
L6	Low	These data represent the standard calculation of benefication plant and used in a commercial activity of the company.

If the expected data are unavailable or lost, the calculations of emissions will be conducted at the most conservative option.

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

PE “SPETSMONTAZH FC” is the owner of the project, which will implement the provisions of this monitoring plan with its organizational and management structure. Leadership, headed by the director of the company is responsible for performance of monitoring, data collection, registration, visualization, storage and reporting of data that were monitored, and periodic inspection of measuring instruments. Detailed structure and senior staff members of the Management Group will be submitted in the monitoring before the initial and first periodic verification. The basic structure demonstrated by the following block diagram:

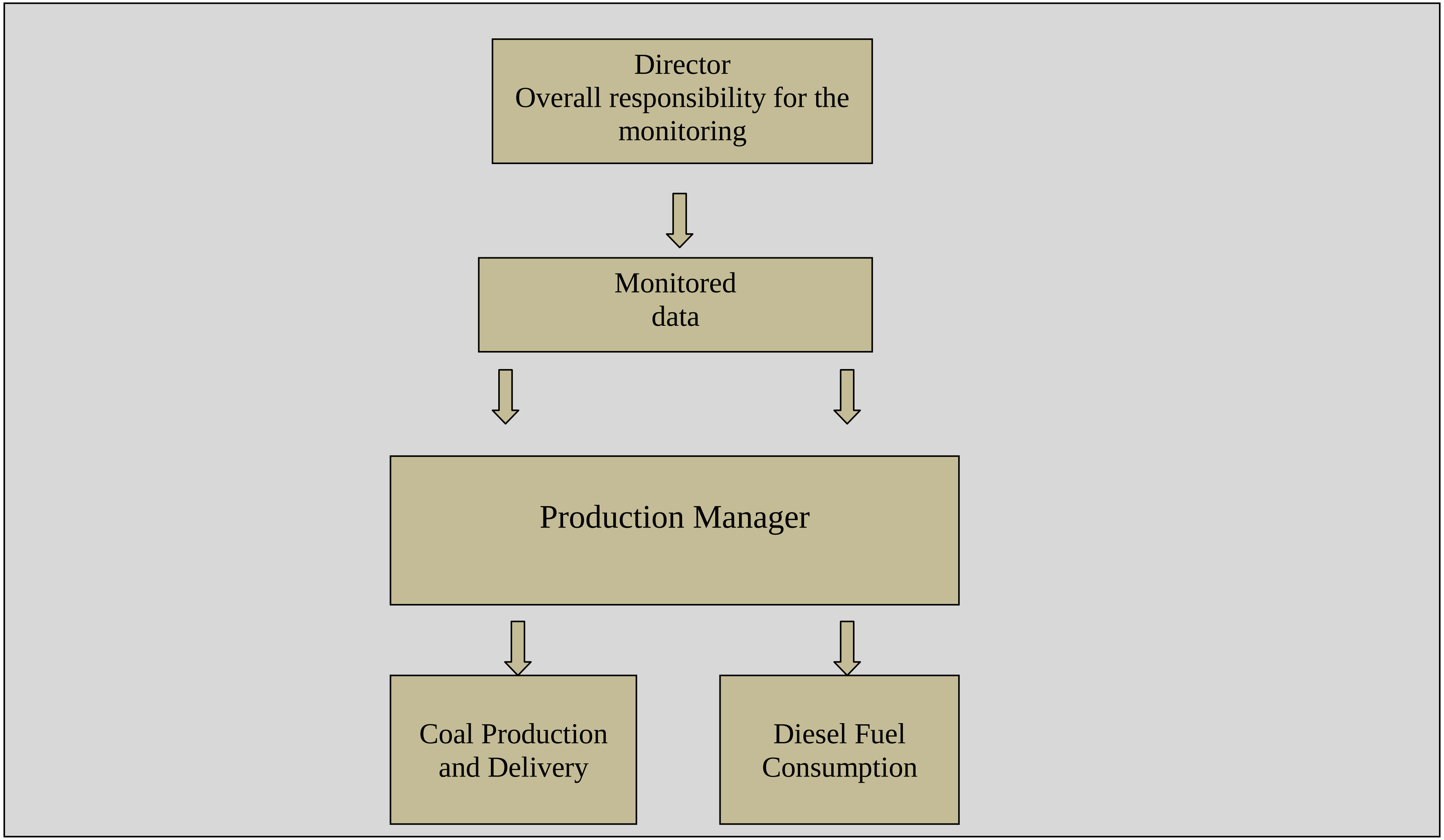


Figure 7 - Monitoring flowchart

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

Klavinsh Gints, Project manager at SIA "Vidzeme EKO", ,which is the project participant. , tel+371-29228458, e-mail: siltisilti@gmail.lv, Please, refer to Annex 1 for contact details.

SECTION E. Estimation of greenhouse gas emission reductions

This section contains the assessment of GHG emissions reductions. Calculations carried out using the formulas described in detail in Section D of this document.

E.1. Estimated project emissions

Table 17 - Estimated project emissions during the crediting period

			2008	2009	2010	2011	2012	Total
1	Project Emissions due to consumption of diesel fuel by the project activity	tCO_2e	3405	19229	19550	19534	19867	81585
	Total for 2008-2012	tCO_2e	**81 585**					

Table 18 - Estimated project emissions after the crediting period

			2013	2014	Total
1	Project Emissions due to consumption of diesel fuel by the project activity	tCO_2e	19867	19867	39734
	Total for 2013-2014	tCO_2e	**39 734**		

E.2. Estimated leakage:

Table 19 – Estimated leakages during the crediting period

			2008	2009	2010	2011	2012	Total
1	Leakages due to fugitive emissions of methane in mining activity	tCO_2e	-88701	-488483	-491913	-494048	-497124	-2060269
2	Leakages due to consumption of electricity from grid in mining activity	tCO_2e	-26285	-151408	-154495	-141321	-142201	-615710
3	Leakages due to consumption of electricity from grid during coal benefication	tCO_2e	3293	18403	18353	18462	18577	77088
	Total	tCO_2e	-111693	-621488	-628055	-616907	-620748	-2598891
	Total for 2008-2012	tCO_2e	**-2 598 891**					

Table 20 – Estimated leakages after the crediting period

			2013	2014	Total
1	Leakages due to fugitive emissions of methane in mining activity	tCO_2e	-497124	-497124	-994248
2	Leakages due to consumption of electricity from grid in mining activity	tCO_2e	-142201	-142201	-284402
3	Leakages due to consumption of electricity from grid during coal benefication		18577	18577	37154
	Total	tCO_2e	-620748	-620748	-1241496
	Total for 2013-2014	tCO_2e	**-1 241 496**		

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

Table 21 - Estimated total project emissions during the crediting period

			2008	2009	2010	2011	2012	Total
1	Total Project emissions during the crediting period	tCO_2e	-108288	-602259	-608505	-597373	-600881	-2517306

Table 22 - Estimated total project emissions after the crediting period

			2013	2014	Total
1	Total Project emissions during the crediting period	tCO_2e	-600881	-577197	-1201762

E.4. Estimated baseline emissions:

Table 23 - Estimated baseline emissions during the crediting period

		2008	2009	2010	2011	2012	Total
Baseline Emissions due to burning of the slurry pond in the year *y*	tCO_2e	233102	1302634	1299396	1305035	1313161	4140167
Total for 2008-2012	tCO_2 e	**4 140 167**					

Table 24 - Estimated baseline emissions after the crediting period

		2013	2014	Total
Baseline Emissions due to burning of the slurry pond in the year *y*	tCO_2e	1313161	1313161	2626322
Total for 2013-2014	tCO_2 e	**2 626 322**		

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

Table 25 - Estimated emission reductions during the crediting period

		2008	2009	2010	2011	2012	Total
Emission reductions during the crediting period	tCO_2e	341390	1904893	1907901	1902408	1914042	7970634
Total Emission reductions during the crediting period	tCO_2e	**7 970 634**					
Average annual emission reductions over the crediting period	tCO_2e	**1 875 443**					

Table 26 - Estimated emission reductions after the crediting period

		2013	2014	Total
Emission reductions during the crediting period	tCO_2e	1914042	1914042	3828084
Total Emission reductions during the crediting period	tCO_2e	**3 828 084**		
Average annual emission reductions over the crediting period	tCO_2e	1914042		

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

Table 27 - Estimated balance of emissions under the proposed project during the crediting period

Year	Estimated Project Emissions (tonnes CO_2 equivalent)	Estimated Leakage (tonnes CO_2 equivalent)	Estimated Baseline Emissions (tonnes CO_2 equivalent)	Estimated Emissions Reductions (tonnes CO_2 equivalent)
2008	3405	-111693	233102	341390
2009	19229	-621488	1302634	1904893
2010	19550	-628055	1299396	1907901
2011	19534	-616907	1305035	1902408
2012	19867	--620748	1313161	1914042
Total (tCO_2 equivalent)	**81 585**	**-2 598 891**	**4 140 167**	**7 970 634**
Average expected emission reductions over the crediting period (tCO_2 equivalent)			**1 875 443**	

Table 28 - Estimated balance of emissions under the proposed project after the crediting period

Year	Estimated Project Emissions (tonnes CO_2 equivalent)	Estimated Leakage (tonnes CO_2 equivalent)	Estimated Baseline Emissions (tonnes CO_2 equivalent)	Estimated Emissions Reductions (tonnes CO_2 equivalent)
2013	19867	-620748	1313161	1914042
2014	19867	-620748	1313161	1914042
Total (tCO_2 equivalent)	**39 734**	**-1 241 496**	**2 626 322**	**3 828 084**
Average expected emission reductions after the crediting period (tCO_2 equivalent)			**1 914 042**	

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:

Activity of PE "SPETSMONTAZH FC" is undertaken under the current legislation of Ukraine, in particular, according to the Laws of Ukraine "On Environmental Protection", "On Ecological Expertise" , "On Air Protection", "On Waste" and other applicable rules and regulations[40].

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.-1-200347 (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 Environment being the competent authority. Project activity, which 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 conducted for the benefication factory "Continent" in 2005 by the project designer SPE "Firma "Pryroda". Key findings of this EIA are summarized below:

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

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

Assessment of impact on the environment under the laws of Ukraine was held for the proposed project in 2008. According to Ukrainian laws and regulations, preparation of reports on evaluation of environmental impact and the positive conclusions of the State Department of Environment and Natural Resources in Luhansk region is the procedure of environmental impact assessment.

40 http://www.budinfo.com.ua/dbn/8.htm

SECTION G. Stakeholders' comments

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

The project meets the applicable standards and requirements, set forth in Ukraine. The Host Party does not put forward the requirement to consult with stakeholders to JI projects. Stakeholders' comments will be collected during the publication of the project documents on the Internet during the determination process.

Annex 1

CONTACT INFORMATION ON PROJECT PARTICIPANTS

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URL:	
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Salutation:	Mr.
Last name:	Foltz
Middle name:	Oleksandrovych
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Annex 2
BASELINE INFORMATION

See Section B in PDD
Table 29 – The key elements of the baseline (including variables, parameters and data sources)

#	***Parameter***	**Data unit**	**Data sources**
1	$FC_{BE,Coal,y}$- Amount of coal that has been mined in the baseline scenario and combusted for energy use in year y	t	Customer data, calculated using formula (2), Section B.1)
2	NCV_{Coal}– Net Calorific Value of coal	TJ/kt	State Standard 4083-2002. Coal and anthracite for powdered combustion in thermal power plants. Kyiv. State Standard of Ukraine 2002. The standard will be provided by an independent expert organization.
3	$OXID_{Coal}$ - Carbon Oxidation factor of coal	d/l	National Inventory Report of Ukraine 1990- 2010, p.459,465,471
4	K_{coal}^{c} - Carbon content of coal.	tC/TJ	National Inventory Report of Ukraine 1990- 2010, p.458, 464, 470
5	p_{WHB} – Probability of slurry pond burning	d/l	SRI report on mine rescue and fire safety “Respirator” 2012. “Report on the propensity for spontaneous ignition of coal benefication waste products of MEP “Slavianoserbska”
6	p_{RB} – Probability of slurry pond burning out	d/l	SRI report on mine rescue and fire safety “Respirator” 2012. “Report on the propensity for spontaneous ignition of coal benefication waste products of MEP “Slavianoserbska”

Annex 3

MONITORING PLAN

Table 30 - Data on measuring geares of the project:

Parameter	measuring geare	Data unit	Producer	The type	serial number	Accuracy class	The date of instalation	He date of the last calibration
The amount of coal	Automobile scales VTA-60	t	"Ukrestmarkinvest" Ltd	Automobile Scales-tensometric	673	± 25 kg	15/05/2008	23/09/2011

See section D in PDD

Annex 4

Calculation the cost of electricity for the processing technology of rock on the enrichment plant

This calculation is based on the technological process of enrichment plant "Shidno-Ukrainska Zbagachuvalna kompaniya". Enrichment plant consist of four technological lines, capacity of 150 tons of slurry per hour each. Output of the final product is according to the balance of processing. As the production lines are identical, the calculation was carried out for one line.
Electricity consumption is calculated as follows:

$$\boldsymbol{E_{el,f}} = \frac{\boldsymbol{N_{el,f}}}{\mathbf{0,34 * P}};$$

$$\boldsymbol{N_{el,f}} = \boldsymbol{N_1} + \boldsymbol{N_2} + \ldots + \boldsymbol{N_i};$$

1. **Preparatory work**.
Slurry, shipped on the industrial site, is transported to the enrichment plant, where the enrichment process is carried out. Slurry through the receiving hopper is shipped by the feeding conveyer SP-80K (power-80kW) on two feeding conveyers (power-11 kW each). Feeding conveyers supply slurry on two scrubber-sizing trammels SB-2,25-8 (power-74kW each), where the previous disintegration and classification of source material is carried out before the enrichment process. When slurry gets into the sizing trammel, it crumbles and falls on the sieve, where water, which is supplied by pump SHN-500 (power-100 kW) under pressure out of nozzles, wash it away as a coal pulp to the under sieve part of the sizing trammel with the set-up size of the upper class. Undersize product – is the rock, pieces of clay, reed, branches; all other things move away through the discharge section of the sizing trammel and by feeding conveyer (total power -22 kW) is sent to waste.

Specific electricity consumption:

$$\boldsymbol{N_1} = \mathbf{80 + 11 + 11 + 74 + 74 + 100 + 22 = 372\ kW - hour}$$

2. Benefication. Pulp by gravity is transported on two shifters GIS-52 (total power – 30 kW), where it is separated into three products; two-are oversize products and one is undersize product. Oversize product (concentrate) with humidity 18-22% by two feeding conveyer (power – 8 kW) is transported to the sedimentation centrifuge OGSH-1320F (power-160 kW), and from the centrifuge by tree feeding conveyers (power- 10.5 kW) with humidity 11-12% to the pile for drying.

$$\boldsymbol{N_2} = \boldsymbol{N_2} = \mathbf{15 + 15 + 8 + 8 + 160 + 10,5 + 10,5 + 10,5 = 237.5\ \ kW - hour}$$

Overall calculation of specific energy consumption per tonne of enriched coal:

$$\boldsymbol{N_{el,f}} = \mathbf{372 + 237,5 = 609.5}\text{кВт} - \text{год}$$

$$\boldsymbol{E_{el,f}} = \frac{\mathbf{609,5}}{\mathbf{0,37 * 150}} = \mathbf{10.982\ kW - hour/t};$$

Annex 5:

Reference of the State Statistics Service of Ukraine "The actual costs of electricity production per one tonne of coal stone agglomerated"

ДЕРЖАВНА СЛУЖБА СТАТИСТИКИ УКРАЇНИ
(Держстат України)

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

29.05.2012р. № 15/1-20/692пі На № ________ від ________

Товариство з обмеженою відповідальністю
«Науково-дослідний центр КТФ»

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

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

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

кВт.г/т

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

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

Заступник Голови Н.С. Власенко

Вик. Смаляна В.П.,
тел.287-36-81

Annex 6:

SRI report on mine rescue and fire safty "Respirator" 2012 «Report on mine rescue and fire safty "Respirator" 2012. "Report on the propensity for spontaneous ignition of coal benefication waste products of MEP "Slavianoserbska"

НАУЧНО-ИССЛЕДОВАТЕЛЬСКИЙ ИНСТИТУТ ГОРНОСПАСАТЕЛЬНОГО ДЕЛА И ПОЖАРНОЙ БЕЗОПАСНОСТИ «РЕСПИРАТОР»

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УТВЕРЖДАЮ
И.о. директора
НИИГД «Респиратор»,
д-р техн. наук, профессор
П.С.Пашковский
04 июля 2012 г.

ЗАКЛЮЧЕНИЕ
О СКЛОННОСТИ К САМОВОЗГОРАНИЮ ОТХОДОВ УГЛЕОБОГАЩЕНИЯ,
бывшей обогатительной фабрики «Красная Звезда»

ИСПОЛНИТЕЛЬ: НИИГД «Респиратор»
ЗАКАЗЧИК: ЧП ПКФ «Тефида»

Основание для проведения испытаний: договор № 1951210910

Научно-исследовательским институтом горноспасательного дела и пожарной безопасности «Респиратор» на основании проведенных испытаний представленных проб отходов углеобогащения в соответствии с КД 12.01.04.009-2000 «Склонность к самовозгоранию углей, шахтных пород и отходов углеобогащения. Методика определения», утвержденным Минтопэнерго Украины 2000-09-26, выдается настоящее заключение о том, что отходы углеобогащения бывшей обогатительной фабрики «Красная Звезда»

СКЛОННЫ К САМОВОЗГОРАНИЮ

Результаты испытаний представлены в протоколе № 33/1-В-12 от 04.07.2012 г. научно-исследовательским институтом горноспасательного дела и пожарной безопасности «Респиратор».

Ответственность за соответствие порядка отбора проб, представленных в НИИГД «Респиратор» на исследование, требованиям КД 12.01.04.009-2000 «Склонность к самовозгоранию углей, шахтных пород и отходов углеобогащения. Методика определения» несет руководство Заказчика.

Заведующий ОБЭПШПО
НИИГД «Респиратор» Е.А. Головченко

…ЧНО-ИССЛЕДОВАТЕЛЬСКИЙ ИНСТИТУТ ГОРНОСПАСАТЕЛЬНОГО ДЕЛА
И ПОЖАРНОЙ БЕЗОПАСНОСТИ «РЕСПИРАТОР»

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УТВЕРЖДАЮ
И.о. директора
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д-р техн. наук, профессор
П.С.Пашковский
04 июля 2012 г.

ПРОТОКОЛ № 33/1-В-12
экспериментального определения склонности к самовозгоранию отходов углеобогащения бывшей обогатительной фабрики «Красная Звезда»

Краткая характеристика отходов углеобогащения: зольность 68,1%, содержание серы 1,25 %, влажность 9,2-15,8 %, выход летучих 3,8-4,5 %.

Исполнитель: НИИГД «Респиратор»
Заказчик: ЧП ПКФ «Тефида»
Согласно с договором № 1951210910

Цель испытаний: установление степени склонности к самовозгоранию отходов углеобогащения.
Испытания проведены в соответствии с КД 12.01.04.009-2000 «Склонность к самовозгоранию углей, шахтных пород и отходов углеобогащения. Методика определения», утвержденным Минтопэнерго Украины 2000-09-26.

Акты отбора проб для испытаний от 25.06.2012 г.

Дата получения проб отвальной массы для испытаний 25.06.2012 г.

Название и основные характеристики средств измерений:
термометр ТЛ-2, зав.№ 99 (пределы измерений 0-250 °С, цена деления 1 °С, ГОСТ 215-73); барометр-анероид, зав.№ 679 (пределы измерений 81-105 кПа, цена деления 0,1 кПа, ГОСТ 6466-73); секундомер механический «Агат», зав.№ 5854 (цена деления 0,2 с, ТУ 25-1819.0021-90); гигрометр психометрический ВИТ-2, зав.№ 149 (пределы измерений 10-100 %, погрешность измерений ±3 %, ТУ 25-11.1645-84); весы технические ВТ-1000, зав.№ 881 (диапазон взвешивания 0,1-1000 г, цена деления 1 мг, ТУ 64-1-990-77Е); линейка измерительная металлическая (граничное измерение до 300 мм, цена деления 1 мм, ГОСТ 427-75), рег.№ 2.

Название и основные характеристики испытательного оборудования:
комплекс хроматографический газовый с детектором по теплопроводности (ДТП) и электронозахватным детектором (ЭЗД) «Хромос ГХ-1000», зав.№ 804 (предел рабочих температур 50 - 350 °С, предел детектирования для ДТП $5{,}0 \cdot 10^{-9}$ г/мл (пропан в гелии), среднеквадратическое отклонение площади пика ±1 %.

Дата испытаний 27.06.2012 г.
Условия проведения испытаний:
температура 24 °С
атмосферное давление 98,2 кПа
осноcительная влажность 52 %

Результаты определения склонности отвальной массы к самовозгоранию

1. Результаты исследований физико-химических свойств отвальной массы

Номер пробы отходов углеобо-гащения	Дробимость, D	Критическая температура, $T_{кр}$, К	Константа скорости сорбции кислорода, $K_{кр}$, $м^3/(моль \cdot с)$	Энергия активации, кДж/моль	Значение максимально возможной температуры, К
1	35,2	358	$8{,}25 \cdot 10^{-9}$	18,75	413
2	36,8	358	$8{,}65 \cdot 10^{-9}$	18,94	418

2. Из проведенных лабораторных исследований видно, что отходы углеобогащения бывшей обогатительной фабрики «Красная Звезда» склонны к самовозгоранию.
3. Вероятность самовозгорания отходов углеобогащения, согласно статистических данных составит 73-75%.
4. Вероятность выгорания отходов углеобогащения, согласно статистических данных составит 23-25%.

ЗАКЛЮЧЕНИЕ

В результате выполненных исследований установлено:

Отходы углеобогащения бывшей обогатительной фабрики «Красная Звезда» склонны к самовозгоранию.

Примечания:
1. Не разрешается снимать копии с протокола в целом или с его отдельных страниц без разрешения НИИГД «Респиратор»

Испытания проводил:

Инженер 1 категории ОБЭПШПО
НИИГД «Респиратор» А.М. Луганский