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

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Annexes

SECTION A. General description of the project

A.1. Title of the project:

"Implementation of Energy Saving Measures at "Central Iron Ore Enrichment Works" Public Joint Stock Company".

Sectoral Scope[1]:
3 – Energy demand
8 – Mining/Mineral Production

Version: 2.0.

Date: November 23, 2012

A.2. Description of the project:

PJSC "Central Ore Mining and Processing Plant" is one of the largest enterprises in Ukraine producing iron ore for metallurgy industry of Ukraine and countries of Eastern Europe. Plant is located in Kryvyi Rih and is in exploitation from 1961. It is the part of group "Metinvest". Material basis of PJSC "Central Ore Mining and Processing Plant" is the deposits of iron quartzites Velyka Gleevatka (career #1), Petrovske (career #3), Artemivske (career #4) and deposit Pivdenna Magnetytova of ore field of the mine named after Ordzhanikidze. This deposits are worked out by the open way and has the maximal size of ore stone 400—1100 mm.

Plant includes three carriers and mine named after Ordzhanikidze with total capacity 14,2 mln tonnes of raw ore per year, breakage facility, concentrating plant with actual capacity of 5 mln tonnes of iron ore concentrate per year, pelletization plant with actual capacity more than 2,2 mln tonnes of pellets per year, supporting workshops.

PJSC "Central Ore Mining and Processing Plant" is the only enterprise in Ukraine, which conducts both open and underground ways of ore extraction.

Construction of the plant was started in 1954 on the basis of the deposit «Velyka Gleevatka».

PJSC "Central Ore Mining and Processing Plant" produces iron ore concentrate and pellets of high quality, the enterprise's products have become a winner of national competition «100 best goods in Ukraine».

In 2010 plant have significantly increased the amounts of production comparing to the previous periods, achieved the highest results in the concentrate production in the latest 20 years. The amount of concentrate production was increased for 21,3% up to 6 mln tonnes. Such results were shown before only in the time of the USSR existing.

The project history starts when on the technical meeting under the direction of the Pelletizing Plant and on the PJSC "Central Ore Mining and Processing Plant" scientific and technical board meeting the decisions on the beginning of the ore pellet and concentrate production modernization were taken.

The realization of the project of production modernization allowed to reduce specific consumption of electric power in the process of pellets and iron ore concentrate production, allowing to reduce its

[1] http://cdm.unfccc.int/DOE/scopes.html

consumption from UETG and to reduce natural gas specific consumption in the process of pellets production, leading to the natural gas consumption reduction. The reduction of energy consumption allows to reduce its consumption from UETG, leading to reduction in fuel consumption for the electric power production and, correspondingly, to the decrease in greenhouse emissions by power plants of Ukraine. Reduction in volumes of natural gas consumption during the pellets production will lead to decrease in greenhouse gas emissions. Reduction in fuel consumption during transportation of mining rock will result in the reduction in diesel fuel burnt by dump trucks which transport mining rock. In its turn, it will lead to greenhouse gases emission reduction.

JI project "Implementation of Energy Saving Measures at "Central Iron Ore Enrichment Works" Public Joint Stock Company" was initiated in 2003, taking into account the possibility of Kyoto mechanisms funds involvement.

Without joint implementation project activity, the baseline for PJSC "Central Ore Mining and Processing Plant" would be maintenance of the existing in the beginning of 2002 technological equipment and heavy dump trucks in a due condition, at the same time the power resources consumption for mining rock transportation and for iron ore concentrate and pellets production and, as the result, greenhouse gases emissions to the atmosphere would stay equal to consumptions and emissions in 2002.

Project activities are aimed at improvement in power efficiency of the plant by the implementation of 2 subprojects:

1. Modernization of iron ore concentrate production – aimed at establishing of high-efficient equipment and optimization of technological processes, which will allow reducing the consumption of electric energy during the production of iron ore concentrate. Reduction in electric energy consumption will allow to reduce energy consumption from UETG, which will result in decrease in fuel consumption for energy production and, correspondingly, reduction in greenhouse gas emissions at the power plants of Ukraine.

2. Modernization of pellets production – the aim of modernization is the establishment of high-efficient equipment and optimization of technological processes, which will allow to reduce consumption in electric power and natural gas during the pellets production. Reduction in electricity consumption will allow to reduce its consumption from UETG leading to reduction in fuel consumption for the electric power production and, correspondingly, to the decrease in greenhouse emissions by power plants of Ukraine. Reduction in volumes of natural gas consumption during the pellets production will lead to decrease in greenhouse gas emissions.

The fulfillment of scheduled activities on decrease in energy efficiency of the production at PJSC "Central Ore Mining and Processing Plant" will result in reduction in volumes of natural gas consumption for pellets, decrease in electric energy consumption in production of iron ore concentrate and pellets which will decrease green house gas emissions into the air.

A.3. Project participants:

Party involved*	Legal entity project participant (as applicable)	Please indicate if the Party involved wishes to be considered as project participant (Yes/No)
Ukraine (host Party)	"Central Ore Mining and Processing Plant"	No
The Netherlands	Metinvest International S.A.	No
*Please indicate if the Party involved is a host Party.		

PJSC "Central Ore Mining and Processing Plant" (ERDPOU code: 00190977) is one of the largest enterprises in Ukraine producing iron ore for metallurgy industry of Ukraine and countries of Eastern Europe. Plant is located in Kryvyi Rih and is in exploitation from 1961.
KVED types of economic activities:
13.10.0 Mining of iron ores;
51.90.0 Other types of wholesale trade;
45.21.1 Construction of buildings;
37.10.0 Recycling of metal waste and scrap;
80.22.0 Technical and vocational secondary education;
60.23.0 Other land passenger transport.

Metinvest International S.A. – metal trading company, established in 1997 in Switzerland, the member of group Metinvest. The company conducts export supplies of metal products to the markets of near abroad and far abroad countries. Metinvest International S.A. is the potential buyer of ERUs generated as a result of the proposed project.

A.4. Technical description of the project:

A.4.1. Location of the project:

The project is located on the territory of PJSC "Central Ore Mining and Processing Plant" in the Dnipropetrovsk region in Kryvyi Rih city. Geographic location of the project is indicated in the figure 1.

Fig.1 – Geographic location of the project

A.4.1.1. Host Party(ies):

Ukraine

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

Dnipropetrovsk region

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

Kryvyi Rih City

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

The project is located on the territory of PJSC "Central Ore Mining and Processing Plant".

PJSC "Central Ore Mining and Processing Plant" is located in the Dnipropetrovsk region in Kryvyi Rih city.

The population of Kryvyi Rih totals 659 090 people.

Geographical coordinates of PJSC "Northern Iron Ore Enrichment Works":
- 48°07'05" North latitude;
- 33°32'43" East longitude.

The area of PJSC "Central Ore Mining and Processing Plant" is shown on the figures 2, 3, 4 below.

Fig. 2 – Helyuvatskyi carrier of PJSC "Central Ore Mining and Processing Plant"

Fig. 3 – Petrovskiy carrier of PJSC "Central Ore Mining and Processing Plant"

Fig. 4 – Artemivskiy carrier of PJSC "Central Ore Mining and Processing Plant"

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

Reduction in greenhouse gas emissions may be achieved as a result of improvement in power efficiency of the plant by the implementation of 2 subprojects. The fulfillment of scheduled activities of decrease in energy efficiency of the production at PJSC "Northern Iron Ore Enrichment Works" will result in reduction in volumes of natural gas consumption for pellets, decrease in electric energy consumption in production of iron ore concentrate and pellets which will decrease green house gas emissions into the air.

The following technical and technological measures were undertaken in the framework of the proposed project:

2003:

1. Implementation of the systems of commercial energy resources metering: electric power, thermal power, natural gas, potable water.
2. Implementation of energy management system and system of control of keeping of specific use of energy resources by structural subdivisions and the company in general;
3. Reconstruction of the heat supply system of the objects of the enterprise central industrial area (construction of local systems of gas mini boiler houses of hot water supply and heat supply).

2004:

Implementation of Automated commercial electricity metering (ACEM).

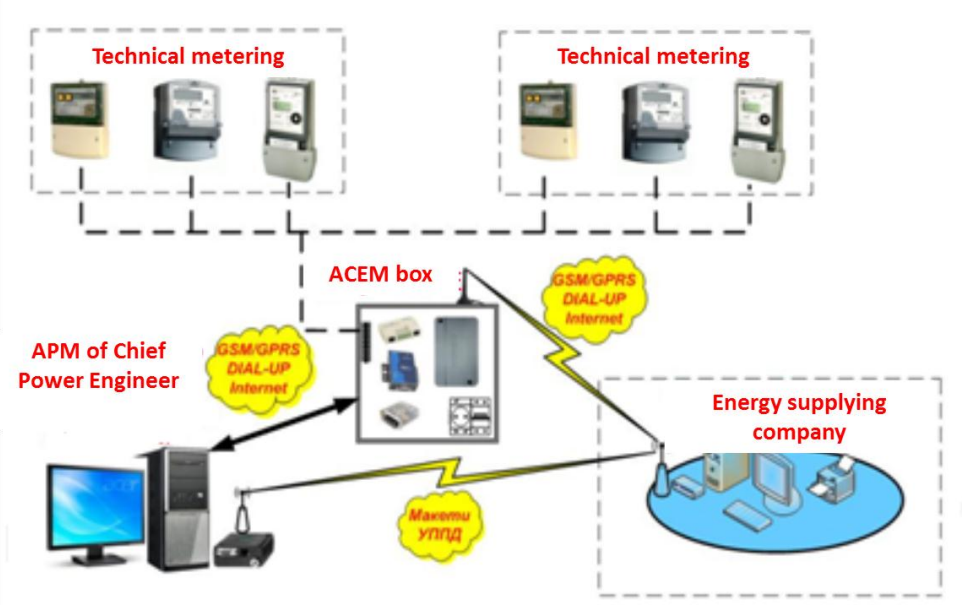

Figure 5 ACEM scheme

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2005:

1. Implementation of thrystor exciters with the system of automatic current regulation of synchronous engines excitation, smoke suckers drives and mills of the pelletizing plant.
2. Putting into operation the condensing units of substations #10 – 35/6 kV, for the purpose of reduction of nuclear power interchange in the technological grids of the plant.
3. Reconstruction of the inner lighting system of the wagon depot UZDT.

2006:

1. Gasification and construction of local systems of gas mini boiler houses of hot water supply and heat supply to the objects of industrial area "Prykaryerna".
2. Implementation of the thyristor exciter with the system of automatic current regulation of excitation of a synchronous engine of drive for a pumping unit of sludge pumping station of slurry management shop.
3. Technical re-equipment of the OK-324 indurating machine to reduce specific expenditure of electric power and natural gas to produce 1 t of pellets:

- Extension of vacuum chamber #11 of smoke sucker D 3-7 was made;

4. Zone of preheating and drying 1 of OK-324 indurating machine was united;
5. Overcut of the gas flue from collector to direct overflow in the drying 2 zone of OK-324 indurating machine was increased.

Figure 6 Indurating machine

2007:

1. Implementation of thyristor system of generator excitation of group G-D of man shaft hoisting unit of shaft "B-4" of mine "Hyhant-Hlyboka".
2. Reconstruction of the heating system of the premises APK and health building of GTC-1 by switching to gas autonomous mini boiler houses.
3. Technical re-equipment of OK-324 indurating machine that allowed reducing specific expenditure of electricity and natural gas to produce 1 tonne of pellets:

- Redistribution of useful areas between zones "drying-1" and "drying-2" of OK-324 indurating machine.

4. Reconstruction of outer lighting system of the plant motor roads, by changing lighters with incandescent lamps P=500W for lighters with HPS lamps P=250W.
5. Reconstruction of inner lighting system of locomotive depot #1 UZDT.
6. Auxiliary transformer 400 kVA was changed for 160 kVA at GPP-8 with the purpose of electricity expenditure reduction in technological elements of electricity supply scheme of the plant.

2008:

1. Reconstruction of compensating bank of capacitors 35 kW GPP-4 together with substitution of ecologically dangerous and outdated condensers for compensating unit with system of automatic power regulation.
2. Implementation of the system of premises heating at the area CRTO with the help of infrared gas radiators.
3. Technical re-equipment of OK-324 indurating machine that allowed reducing specific expenditure of electricity and gas to produce 1 tonne of pellets:

Expansion of the high-temperature burning zone by means of joining the vacuum chamber #17 of OK-324 indurating machine.

2009:

1. Automated system of compressed air metering was implemented at the pelletizing plant.
2. Technical re-equipment of OK-324 indurating machine that allowed reducing specific expenditure of electricity and gas to produce 1 tonne of pellets:
   - Joining the cap of preliminary heating and drying-1 zone in a common cap of OK-34 machine.
   - Supply of primary air with the temperature of 270 °C to the injection burners of the machine by means of selecting the necessary amount of air take-off from the gas flue of the smoke sucker D-1.
   - VDN-1 fan was taken out of the scheme of primary air supply to the injection burners of the machines due to supply of necessary amount of gas-air mixture from the smoke sucker D-1.
   - The distant work of the damper of apron between caps of drying 2 zones was renewed for the drying process intensification and moisture removal in green pellet.

3. Implementation of three three-sided exciters with the system of automatic current regulation of exciting synchronous engines of driver of pumping unit of sludge pump station of slurry pumping installation and pumping unit of recycling water supply of technical power supply shop.
4. Replacement of thyristor converter TPE by SBSh-250M #15, and electric engine of constant current of rotator D-808 by electric engine of alternating current AMURU280 with frequency converter.
5. Reconstruction of outer lighting system on the territory of the transport shop of the plant by changing lighters with incandescent lamps P=500W for lighters with HPS lamps P=250W.
6. Replacement of transformer 160 kWA in KTP #2 of lighting of overload of Petrovskyi open pit to transformer 160 kVA with the purpose of reduction of electricity losses in technological elements of the scheme of electricity supply to the plant.

2010:

1. Replacement of electric machine converters of synchronous engines exciters and general excitation of management chains and drivers of constant current of excavating machines ESh-6.5/45 #9 of Hleyuvatskyi open pit and EKG #16 of Artemivsk open pit by static converters.

Figure. 7 Excavating machine EGK.

2. Optimization of excitation current of synchronous engines of pumping units #5, #6 of pumping station of slurry pumping installation shop by introduction of thyristor exciters with automated system of regulation of excitation current of synchronous engine was implemented.
3. Change of a drive of vacuum filters #41, #42, #43 of the filtration area of beneficiation plant from constant current to alternating current was done. Asynchronous engines with capacity of 7.5 kW with frequency converters were implemented.
4. Modernization of the scheme of hydro compression supply of pumping unit of pumping station # 4 of the slurry pumping installation shop by means of taking pump D 2500-63/2 with driving engine with capacity of P = 500 kW out the scheme and implementation of pump D 315/70 with driving engine with capacity of P = 75 kW.

5. Implementation of the system of regulation of natural gas supply to gas boiler KOLVI depending on the environmental temperature in the automobile column #1, by means of implementation of outer temperature sensor.
6. During the work of underground crushing complex of Hleyuvatskyi pit banks of capacitors are implemented at substation # 10 – 35/6 kW with capacity of 1388 kVAr with I and II sections of bus bars, which reduce reactive electric power interchange and losses of active electric power in the elements of electricity supply to the plant.
7. Replacement of transformer TP-250 kVA by NOM-6 10 kVA of electricity supply of lighting of the shooting post of Artemivsk open pit with the purpose of reduction of electricity consumption in the elements of scheme of electricity supply to the plant.

2011:
1. Replacement of hydro compression pump at pumping station # 5 of slurry pumping installation shop of type D200 with driving electric engine with capacity of P = 132 kW by the pump of type K-100 with driving electric engine with capacity of 45 kW.
2. Reconstruction of the heating system of the shaft of the mine named after Ordzhonikidze by means of installation of electric heaters with general capacity of 306 kW with output to the calorific unit reservoir.
3. Implementation of autonomous heat supply to the premises of GTC-1 using saving heaters of UFO-1800 type in amount of 30 pieces.
4. Replacement of HID lamps with capacity of P = 700 W in amount of 30 pieces by compact fluorescent lamps with capacity of P = 105 W in amount of 60 pieces for overhead illumination in the concentrate stock of beneficiation plant.
5. Replacement of electric machine converters of synchronous engines exciters and general excitation of management chains and drives of constant current of excavating machines EKG-8I #40 of Hleyuvatskyi open pit and ESh-10/70 #5 of Hleyuvatsky open pit by static converters.

Figure 8 Works at Helyuvatskyi open pit.

6. Replacement of lighters with incandescent lamps P = 750 by sodium high pressure HPS lamps with capacity of P = 250 in amount 148 pieces for overhead illumination in the shop floors of the pelletizing plant.
7. Implementation of thyristor converter to group G-D of skip lifting unit of brand TEP-320-115 coming with transformer instead of machine exciter at mine named after Ordzhonikidze.
8. Optimization of excitation current of synchronous engines of pumping units #7, #8 of pumping station of the slurry pumping installation shop and pumping units of recycling water supply of the shop of technical electricity supply by means of implementation of thyristor exciters with digital system of automatic regulation of excitation current of synchronous engine.
9. Implementation of condenser compensating installation 6 kW with capacity of 4.25 MVAr at substation 35/6 kW "Hyhant-Hlyboka" of mine "Hyhant-Hlyboka".

The result of the implemented complex of energy saving measures was significant reduction of energy resources consumption for manufacturing of production at "Central Ore Mining and Processing Plant" PJSC and relevant greenhouse emissions reduction. The effects from the biggest realized measures are presented below:

- Modernization of OK-324 indurating machine (step-wise from 2005) allowed achieving specific natural gas consumption reduction during production of iron ore pellets in specific indicators from 15.0 m^3/t to 11.4 m^3/t;
- Implementation of condenser compensating installations allowed realizing and automatizing the process of compensation of reactive energy overflow and reduce enterprise's expenses by 12-17%;
- Usage of effective system of electric drives management on the basis of scheme "thyristor converter – engine" allowed reducing exploitation as well as energy costs.

Measures for the further years are to be agreed with the enterprise's management. All the information concerning JI project is provided in this document.

Table 1.Implementation schedule for the measures foreseen in the framework of JI project.

Year	Content of implemented measures
2003	• Implementation of the systems of commercial energy resources metering • Implementation of energy management system and system of control of keeping of specific use of energy resources by structural subdivisions and the company in general • Reconstruction of the heat supply system of the objects of the enterprise central industrial area
2004	• Implementation of Automated commercial electricity metering (ACEM).
2005	• Implementation of thrystor exciters with the system of automatic current regulation of synchronous engines excitation, smoke suckers drives and mills of the pelletizing plant • Putting into operation the condensing units of substations #10 – 35/6 kV, for the purpose of reduction of nuclear power interchange in the technological grids of the plant • Reconstruction of the inner lighting system of the wagon depot UZDT
2006	• Gasification and construction of local systems of gas mini boiler houses of hot water supply and heat supply • Implementation of the thyristor exciter with the system of automatic current regulation of excitation of a synchronous engine of drive for a pumping unit of sludge pumping station of slurry management shop • Technical re-equipment of the OK-324
2007	• Implementation of thyristor system of generator excitation of group G-D of man shaft hoisting unit of shaft “B-4” of mine “Hyhant-Hlyboka”. • Reconstruction of the heating system of the premises APK and health building of GTC-1 by switching to gas autonomous mini boiler houses. • Technical re-equipment of the OK-324 • Reconstruction of outer lighting system of the plant motor roads • Reconstruction of inner lighting system of locomotive depot #1 UZDT • Auxiliary transformer 400 kVA was changed for 160 kVA at GPP-8 with the purpose of electricity expenditure reduction in technological elements of electricity supply scheme of the plant
2008	• Reconstruction of compensating bank of capacitors 35 kW GPP-4 • Implementation of the system of premises heating at the area CRTO with the help of infrared gas radiators • Technical re-equipment of the OK-324
2009	• Automated system of compressed air metering was implemented at the pelletizing plant • Technical re-equipment of the OK-324 • Implementation of three three-sided exciters with the system of

	automatic current regulation of exciting synchronous engines of driver of pumping unit of sludge pump station of slurry pumping installation and pumping unit of recycling water supply of technical power supply shop • Replacement of thyristor converter TPE by SBSh-250M #15, and electric engine of constant current of rotator D-808 by electric engine of alternating current AMURU280 with frequency converter • Reconstruction of outer lighting system on the territory of the transport shop of the plant • Replacement of transformer 160 kWA in KTP #2 of lighting of overload of Petrovskyi open pit to transformer 160 kVA
2010	• Replacement of electric machine converters of synchronous engines exciters and general excitation of management chains and drivers of constant current of excavating machines ESh-6.5/45 #9 of Hleyuvatskyi open pit and EKG #16 of Artemivsk open pit by static converters • Optimization of excitation current of synchronous engines of pumping units #5, #6 of pumping station of slurry pumping installation shop by introduction of thyristor exciters with automated system of regulation of excitation current of synchronous engine was implemented • Change of a drive of vacuum filters #41, #42, #43 of the filtration area of beneficiation plant from constant current to alternating current was done • Modernization of the scheme of hydro compression supply of pumping unit of pumping station # 4 of the slurry pumping installation shop • Implementation of the system of regulation of natural gas supply to gas boiler KOLVI depending on the environmental temperature in the automobile column #1 • During the work of underground crushing complex of Hleyuvatskyi pit banks of capacitors are implemented at substation # 10 – 35/6 kW with capacity of 1388 kVAr with I and II sections of bus bars • Replacement of transformer TP-250 kVA by NOM-6 10 kVA of electricity supply of lighting of the shooting post of Artemivsk open pit with the purpose of reduction of electricity consumption in the elements of scheme of electricity supply to the plant
2011	• Replacement of hydro compression pump at pumping station # 5 of slurry pumping installation shop of type D200 with driving electric engine with capacity of P = 132 kW by the pump of type K-100 with driving electric engine with capacity of 45 kW • Reconstruction of the heating system of the shaft of the mine named after Ordzhonikidze by means of installation of electric heaters with general capacity of 306 kW with output to the calorific unit reservoir • Implementation of autonomous heat supply to the premises of GTC-1 using saving heaters of UFO-1800 type • Replacement of HID lamps with capacity of P = 700 W in amount of 30 pieces by compact fluorescent lamps with capacity of P = 105 W

	• Replacement of electric machine converters of synchronous engines exciters and general excitation of management chains and drives of constant current of excavating machines EKG-8I #40 of Hleyuvatskyi open pit and ESh-10/70 #5 of Hleyuvatsky open pit by static converters • Replacement of lighters with incandescent lamps P = 750 by sodium high pressure HPS lamps with capacity of P = 250 in amount 148 pieces for overhead illumination in the shop floors of the pelletizing plant • Implementation of thyristor converter to group G-D of skip lifting unit of brand TEP-320-115 coming with transformer instead of machine exciter at mine named after Ordzhonikidze • Optimization of excitation current of synchronous engines of pumping units #7, #8 of pumping station of the slurry pumping installation shop and pumping units of recycling water supply of the shop of technical electricity supply by means of implementation of thyristor exciters with digital system of automatic regulation of excitation current of synchronous engine • Implementation of condenser compensating installation 6 kW with capacity of 4.25 MVAr at substation 35/6 kW "Hyhant-Hlyboka" of mine "Hyhant-Hlyboka"

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 major activity of PJSC "Central Ore Mining and Processing Plant" is a production of crude ore concentrate and pellets. The company provides a full technological cycle starting with iron ore mining and ending up with production of iron ore pellets.

The emissions reduction will occur due to the implementation of 2 subprojects:

1. Modernization of iron ore concentrate production

The proposed subproject will allow to reduce the specific consumption of electric energy per ton of produced iron ore concentrate. Energy consumption reduction will allow to decrease the amount of energy consumption out of UETG, this will allow to reduce the fossil fuel combustion needed for energy production at Ukrainian energy enterprises.

2. Modernization of pellets production

The proposed subproject will allow to reduce the specific consumption of electric energy and specific consumption of natural gas per ton of produced pellets. Energy consumption reduction will allow to decrease the amount of energy consumption out of UETG, this will lead to the reduction of fuel consumption needed for energy production thus causing the GHG emissions reduction at Ukrainian energy enterprises. The decrease in quantity of natural gas combustion needed for pellets production will let to reduce the GHG emissions.

Environmental legislation is not yet perfect in Ukraine, so far it is not fully adapted to the current requirements of international environmental bodies and European Union standards. There is no targeted state policy in Ukraine requiring to reduce greenhouse emissions by the mining industry enterprises.

Significant financial resources are required for implementation of all activities scheduled according to the project. Project-related costs are planned to be partly compensated at the expense of reduction in energy recourses and thus, leading to the decrease of production cost. However this mechanism of investments reimbursement does not allow to fulfill all the measures within the enterprise modernization project framework.

To implement the planned energy-saving measures in full, both own funds of the Company and credit resources are used. The latter source has being disadvantageous because of high interest rates. The possibility to attract investments using mechanism of joint implementation allows the Company management to perform measures which could not be implemented without funds that PJSC “Central Ore Mining and Processing Plant” plans to receive from selling emission reduction units.

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

Beginning of crediting period starts in 2004. From the beginning of crediting period till the end of 2007, the assigned amount units (AAUs) will be generated.

Table 2. Estimated GHG emission reduction for the period 2004-2007

	Years
Duration of the crediting period	4
Year	Number of the assigned amount units, t $CO_{2\,e}$
2004	10192
2005	17280
2006	46935
2007	72094
Total emission reduction during the crediting period (t $CO_{2\,e}$)	**146501**
Average annual emission reduction during the crediting period (t $CO_{2\,e}$)	36625

The first commitment period under the Kyoto Protocol is from 2008 till 2012.

Table 3. Estimated GHG emission reduction for the period 2008-2012

	Years
Duration of the crediting period	5
Year	Number of the emission reduction units, t $CO_{2\,e}$
2008	107541
2009	92049
2010	117988
2011	118883
2012	118883
Total emission reduction during the crediting period (t $CO_{2\,e}$)	**555344**
Average annual emission reduction during the crediting period (t $CO_{2\,e}$)	111069

In case if after the first commitment period under the Kyoto Protocol, it will be prolonged, the crediting period may be extended till the finalization of expected project operational lifetime.

Table 4. Estimated GHG emission reduction for the period 2013-2020

	Years
Duration of the crediting period	8
Year	Number of the emission reduction units, t $CO_{2\,e}$
2013	118883
2014	118883
2015	118883
2016	118883
2017	118883
2018	118883
2019	118883
2020	118883
Total emission reduction during the crediting period (t $CO_{2\,e}$)	**951064**
Average annual emission reduction during the crediting period (t $CO_{2\,e}$)	118883

A.5. Project approval by the Parties involved:

Justification materials for the potential joint implementation project, intending to obtain a letter of endorsement by the owner of the source, were sent to the State Environmental Investment Agency of Ukraine. The State Environmental Investment Agency of Ukraine issued for this purpose a Letter of Endorsement #3581/23/7 dated 22/11/2012.

After the procedure of project determination, the final version of documentation and the determination report will be submitted to the State Environmental Investment Agency of Ukraine in order to obtain a Letter of Approval.

The procedure of the issuance of Letter of Approval from the Netherlands was started from the moment of issuance of Letter of Endorsement from Ukraine. For the present moment Letter of Approval from the Netherlands is at the stage of preparation and will be issued after the determination passing.

SECTION B. Baseline

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

The baseline for this project was chosen according to "Guidance on criteria for baseline setting and monitoring" (version 03)[2]. Correspondingly to the document, the selection of the baseline can be stated on a certain approach that is used only for a specific JI project, or on a standard approach with the use of methodologies including small-scaled that are approved by the Joint Implementation Supervisory Committee.

Since this project consists of several subprojects that are aimed at different key factors allowing to reduce greenhouse gas emission, the baseline was identified on the basis of certain approach. According to "Guidance on criteria for baseline setting and monitoring" (version 03) for such projects, based on the certain approach, specific methodological parts can be included into the baseline setting, that are approved by the Joint Implementation Supervisory Committee. The methodological tool "Combined tool to identify the baseline scenario and demonstrate additionality" (version 03.0.0)[3] was chosen for the project baseline setting.

Baseline setting based on identification of the most plausible among the alternative scenarios, that are able to secure output production quality, without reducing the volume of production, and meet the requirements of the acting legislation in Ukraine.

GHG emission reduction is not obligatory according to the active legislation of Ukraine. Law #2707-XII of Ukraine "On air protection"[4] dated 16/10/1992 regulates the national policy of Ukraine on hazardous emissions into the air. This Law doesn't include any requirements concerning GHG emissions by the industry. Requirements concerning permissible air pollution are envisaged by the Order #309 dated 27/06/2006 on "On approving the maximum permissible dose of stationary sources pollutants"[5].

Baseline of this project was selected by the following steps:
1. Identification of realistic and effective alternatives;
2. Rejection of alternatives that do not comply with active legislations and regulations;
3. Rejection of alternatives that include barriers for their achievement.

Step 1. Identification of realistic and effective alternatives

To determine the baseline, two the most probable alternatives were selected for the project activity.

Alternative 1.1	Continuation of current situation at the plant without activities improving power efficiency
Alternative 1.2	Performance of project activities without joint implementation mechanisms

[2] http://ji.unfccc.int/Ref/Documents/Baseline_setting_and_monitoring.pdf
[3] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-02-v3.0.0.pdf
[4] http://zakon1.rada.gov.ua/cgi-bin/laws/main.cgi?nreg=2707-12
[5] http://zakon.rada.gov.ua/cgi-bin/laws/main.cgi?nreg=z0912-06

1.1 Continuation of current situation at the plant without activities improving power efficiency

According to this alternative, the enterprise will not implement any modernization of enterprise production capacity and technological vehicles.

1.2 Performance of project activities without joint implementation mechanisms

This alternative presumes to implement all the modernization activities at the plant, without using joint implementation mechanisms.

Step 2. Rejection of alternatives that do not comply with active legislations and regulations

All the above mentioned alternatives comply with the active legislation requests and corresponding regulations.

Step 3. Rejection of alternatives that include barriers for their achievement

Substep 3a. Financial barriers

Alternative 1.1 does not include significant financial issues, the plant does not require modernizations and can continue to purchase the natural gas and electric power for production and heating needs of the plant.

Alternative 1.2 is not financially attractive without engaging the joint implementation mechanisms. Introduction of this alternative requires significant plant modernization and financial investments that are possible to obtain by joint implementation project implementation.

Attracting funding in required amount from external sources has been and remains improbable.

It should be noted. that when making investment decisions (2003) the economic situation in Ukraine was extremely difficult. The continuous downward trend in GDP throughout the previous decade[6] did the prospect of the project activity improbable.

The chances of attracting funds from abroad have been and are relatively low. As in 2001, Ukraine was considered to be a high risk for business and investment. Overall entrepreneurial sector in Ukraine was very weak. Inappropriate accounting standards prevented the assessment of creditworthiness. Corporate governance has been recognized outside of transparency and open to abuse.

This can be illustrated by the fact that in 2000 Ukraine has managed to attract only 792.2 million dollars of direct foreign investment. In the same year residents seized assets worth 189.6 million dollars. As of 01.01.2001, the total foreign investment in the country was 3 865.5 million, corresponding indicator only $ 78 dollars per capita[7]. This indicator clearly shows that the Ukrainian market was unattractive to investors at the beginning of the project.

Another factor which has further undermined the Ukrainian financial market during this period was a sovereign default on Eurobonds denominated German mark in February 2000 and defaulted on bonds denominated in U.S. dollars in January 2000. Ukrainian government had to

[6] http://ukrstat.gov.ua/operativ/operativ2005/vvp/vvp_ric/vvp_e.htm
[7] Ukrstat.gov.ua

offer to exchange bonds with a longer term and lower purchasing power. Appeal was taken by a majority of bondholders, but massive withdrawal of Western investors in the country began[8].

There were actually no funds, whether in the form of equity investments or loans that are available on domestic markets to implement medium- and long-term projects. Any capital that was available had very high cost. Ukraine had the very high price of credit, which was (and is often still is) much higher than elsewhere in the region.

The legal framework which existed at that time and continue to exist at present, widely regarded as inappropriate, and largely prevent the development of a transparent market economy in Ukraine. Frequent and unpredictable changes to the laws of conflicting and inconsistent codes do not allow the distribution of transparent and stable legal environment of business. This is perceived as a great source of uncertainty for international companies that make prediction of future achievement of business goals and strategies with a high degree of risk.

Registration of JI project will allow to receive partial refund with funds from the sale of emission reduction units, and give the project the status of environmentally oriented and will make getting loans easier. The factors listed above are key factors when deciding on the project realization.

Substep 3b. Technological barriers

Alternative 1.1 does not include technological barriers, the plant does not require modernization and can continue to use its production facilities and technological vehicles, following the corresponding exploitation instructions and planned maintenance and repair works.

Alternative 1.2 requires significant plant modernization. The project presumes the installation of a new, technically complicated, equipment which demands high level of qualification from maintenance staff in order to reach the estimated energy efficiency figures.

Complexity of production process and proposed measures, changing in the prices of energy resources in Ukraine do not allow to predict energy and economical results from the realization of measures in the framework of proposed project. Uncertanity of results leads to additional risks for the project owner.

Selection of baseline

After the fulfilling the three steps, only one realistic scenario was chosen, i.e. continuation of the current situation at the plant without modernization envisaged by the project (alternative 1.1), and, thus, it is the baseline of the joint implementation project. The alternative 1.2 was set aside at step 3, as there are too many barriers (technical and financial) for its implementation.

In tables below parameters determined at the stage of determination and are consistent throughout the crediting period and parameters that should be monitored during the crediting period are provided.

Table 5. Parameters that are determined at the stage of determination and are consistent throughout the crediting period

	Indication	*Parameter*

[8] http://www.moodys.com/sites/products/DefaultResearch/2007100000482445.pdf page7

1.	$SFC_{pellets,NG,BC}$	Specific consumption of natural gas while pellets production in baseline scenario
2.	$SEC_{iron\ ore}$	Specific consumption of electricity while iron ore production in baseline scenario
3.	$SEC_{pellets,elec,BC}$	Specific consumption of electricity while pellets production in baseline scenario

Table 6. Parameters that should be monitored during the crediting period

	Indication	*Parameter*
1.	$EF_{co2,elec,y}$	Emission factor for UESU
2.	$NCV_{NG,BC,y}$	Net calorific value for natural gas in baseline scenario
3.	$OXID_{NG,y}$	Carbon emission factor while natural gas consumption
4.	$W_{NG,y}$	Carbon content in natural gas

The key parameters for setting the baseline are presented in the tables below.

Data/Parameter	$SEC_{iron\ ore}$
Data unit	kWh/t
Description	Baseline specific electric energy consumption during iron ore concentrate production
Time of determination/monitoring	Fixed data. It must be stored during the whole crediting period and 2 years after the last transfer of emission reduction units
Source of data (to be) used	The fixed value for this parameter is based on the chronological data on iron ore concentrate production within 1 year before subproject activity implementation
Value of data applied (for ex ante calculations/determinations)	Values for this parameter is given in the Excel calculation file attached to this PDD
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Fixed data
QA/QC procedures (to be) applied	-
Any comment	-

Data/Parameter	$EF_{co2,elec}$
Data unit	t $CO_{2\ e}$/MWh
Description	Emission factor for UETG
Time of determination/monitoring	Annually. Data must be stored during the whole crediting period and 2 years after the last transfer of emission reduction units
Source of data (to be) used	2004-2005 – "Operational Guidelines for Project Design Documents of Joint Implementation Projects. Volume 1: General guidelines" (Version 2.3)[9]; 2006-2007– Study "Standardized emission factors for the Ukrainian electricity grid" (Version 5)[10]; 2008 – The order #62 dated 15/04/2011, issued by the National Environmental Investment Agency of Ukraine[11]; 2009 – The order #63 dated 15/04/2011, issued by the National Environmental Investment Agency of Ukraine[12]; 2010 –The order #43 dated 28/03/2011, issued by the National Environmental Investment Agency of Ukraine[13]; 2011-2020 – The order #75dated 12/05/2011, issued by the National Environmental Investment Agency of Ukraine[14]
Value of data applied (for ex ante calculations/determinations)	0,916 – year 2004; 0,896 – years 2005-2007; 1,082 – year 2008; 1,096 – year 2009; 1,093 – year 2010; 1,090 – 2011-2020
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Studies to determine this factor for 2004-2005 was held by the Ministry of Economic Affairs of the Netherlands, for 2006-2007 was held by the Global Carbon B.V. company and determined by the TUEV SUED company, the further research was held under the control of the National Environmental Investment Agency of Ukraine
QA/QC procedures (to be) applied	-
Any comment	-

[9] ji.unfccc.int/CallForInputs/BaselineSettingMonitoring/ERUPT/GuidVol1.doc
[10] http://ji.unfccc.int/UserManagement/FileStorage/46JW2KL36KM0GEMI0PHDTQF6DVI514
[11] http://www.neia.gov.ua/nature/doccatalog/document?id=127171
[12] http://www.neia.gov.ua/nature/doccatalog/document?id=127172
[13] http://www.neia.gov.ua/nature/doccatalog/document?id=126006
[14] http://www.neia.gov.ua/nature/doccatalog/document?id=127498

Data/Parameter	$SFC_{pellets,NG,BC}$
Data unit	m^3/t
Description	Natural gas specific consumption during baseline pellets production
Time of determination/monitoring	Fixed data. It must be stored during the whole crediting period and 2 years after the last transfer of emission reduction units
Source of data (to be) used	The fixed value for this parameter is based on the chronological data on pellets production
Value of data applied (for ex ante calculations/determinations)	Values for this parameter is given in the Excel calculation file attached to this PDD
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Fixed data
QA/QC procedures (to be) applied	-
Any comment	-

Data/Parameter	$SEC_{pellets,elec,BC}$
Data unit	kWh/t
Description	Electric energy specific consumption during baseline pellets production
Time of determination/monitoring	Fixed data. It must be stored during the whole crediting period and 2 years after the last transfer of emission reduction units
Source of data (to be) used	The fixed value for this parameter is based on the chronological data on pellets production
Value of data applied (for ex ante calculations/determinations)	Values for this parameter is given in the Excel calculation file attached to this PDD
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Fixed data
QA/QC procedures (to be) applied	-
Any comment	-

Data/Parameter	$NCV_{NG,BC,y}$
Data unit	Gcal/mln. m^3
Description	Net calorific value for natural gas in baseline scenario
Time of determination/monitoring	Annually. Data must be stored during the whole crediting period and 2 years after the last transfer of emission reduction units
Source of data (to be) used	National Inventory Report of Ukraine 1990-2010[15]
Value of data applied (for ex ante calculations/determinations)	Values for this parameter is given in the Excel calculation file attached to this PDD
Justification of the choice of data or description of measurement methods and procedures (to be) applied	The National Inventory of Ukraine is subject to periodic revision and submission of relevant corrective data
QA/QC procedures (to be) applied	-
Any comment	-

Data/Parameter	$OXID_{NG}$
Data unit	mass or volume unit
Description	Factor of carbon oxidation during natural gas combustion
Time of determination/monitoring	Annually. Data must be stored during the whole crediting period and 2 years after the last transfer of emission reduction units
Source of data (to be) used	National Inventory Report of Ukraine 1990-2010[16]
Value of data applied (for ex ante calculations/determinations)	0,995
Justification of the choice of data or description of measurement methods and procedures (to be) applied	The National Inventory of Ukraine is subject to periodic revision and submission of relevant corrective data
QA/QC procedures (to be) applied	-
Any comment	-

[15] http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/6598.php
[16] http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/6598.php

Data/Parameter	W_{NG}
Data unit	t C/TJ
Description	Carbon content in natural gas
Time of determination/monitoring	Annually. Data must be stored during the whole crediting period and 2 years after the last transfer of emission reduction units
Source of data (to be) used	National Inventory Report of Ukraine 1990-2010[17]
Value of data applied (for ex ante calculations/determinations)	

Рік	т С/ТДж
2004	15,13
2005	15,14
2006	15,18
2007	15,11
2008	15,12
2009	15,11
2010	15,11
2011	15,11
2012	15,11
2013	15,11
2014	15,11
2015	15,11
2016	15,11
2017	15,11
2018	15,11
2019	15,11
2020	15,11

Justification of the choice of data or description of measurement methods and procedures (to be) applied	The National Inventory of Ukraine is subject to periodic revision and submission of relevant corrective data
QA/QC procedures (to be) applied	-
Any comment	-

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:

Emission sources of this project were determined separately for each subproject. Sources of greenhouse gases emissions are:

1. Modernization of iron ore concentrate production – the baseline and project emission sources caused by energy consumption from Ukrainian Electricity Transmission Grid are energy enterprises which generate energy for UETG. Emissions reduction will be achieved by the reduction in the specific consumption of electric energy needed for iron ore concentrate production. Energy consumption reduction will allow to decrease the amount of energy consumption out of UETG, this will allow to reduce the fuel consumption needed for energy production and, thus, GHG emission reduction at Ukrainian energy enterprises.

[17] http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/6598.php

2. Modernization of pellets production – the baseline and project emission sources caused by natural gas consumption are technological equipment of the pellets production, and emissions caused by energy consumption from Ukrainian Electricity Transmission Grid are energy enterprises which generate energy for UETG. The reduction in the specific consumption of electric energy and specific consumption of natural gas during pellets production will lead to the reduction of GHG emissions into the atmosphere. Energy consumption reduction will allow to decrease the amount of energy consumption out of UETG, this will lead to the reduction of fuel consumption needed for energy production thus causing the GHG emissions reduction at Ukrainian energy enterprises.

It is important to note that the implementation of measures mentioned above will allow to reduce greenhouse gas emissions into the atmosphere, that cannot be achieved if this project will not be introduced. PJSC "Central Ore Mining and Processing Plant" has no financial benefits from the reduction of greenhouse emissions into the atmosphere. Therefore any reduction of harmful emissions to the atmosphere achieved within the range of joint implementation project will be additional.

The additionality of proposed joint implementation project was estimated according to the "Tool for the demonstration and assessment of additionality" (version 06.0.0)[18]. This tool presumes a step-by-step estimation of project additionality.

Step 1. Identification of alternative activities within the project that comply with Ukrainian active legislation

Sub-step 1a. Determination of alternative activities within the project:

As mentioned in section B.1, two more activities were determined besides the joint implementation project:
1 To continue current situation without implementation of energy-saving measures;
2 Implementation of project activities without joint implementation mechanisms.

Sub-step 1b. Conformity to the active legislation:

All the alternatives mentioned above conform the active legislation and relevant regulations.

According to the Ukrainian law in force the reduction of GHG emissions into the atmosphere is not obligatory. The national policy concerning this subject is determined by the Ukrainian law "On the air protection" #2707-XII dated 16/10/1992. This law does not implement exact requirements concerning industrial emissions of greenhouse gases. The requirements concerning permitted emissions into the atmosphere are regulated by the Order #309 dated 27/06/2006 "On adoption of standards for permitted stationary sources air pollutants", issued by the Ministry of Environmental Protection of Ukraine.

Step 2.Investment analysis

In accordance with the Tool for the assessment of additionality.

Step 3. Barrier analysis

Sub-step 3a. Identification of barriers impeding the realization of joint implementation project.

1. Financial barriers

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

The project activities are not financially attractive without application of joint implementation mechanisms. The realization of this project requires considerable modernization of the plant and financial investments, which can be obtained only through the realization of the joint implementation project.

Project activity under the proposed projectis is leng-termed complex action foreseen for the period 2003 -2020. Project foresees the significant amount of investments from 2003 to 2011 (1 002 millions UAH) for the period 2012-2025 additional investments are planned (389 millions UAH). General amount of project investments should be equal to 1 392 millions UAH.

This amount is too high for PJSC "Northern Iron Ore Enrichment Works". This level of income does not allow the company to finance a program of activities at their own expense.

Attracting funding in required amount from external sources has been and remains improbable.

It should be noted. that when making investment decisions (2002) the economic situation in Ukraine was extremely difficult. The continuous downward trend in GDP throughout the previous decade[19] did the prospect of the project activity improbable.

The chances of attracting funds from abroad have been and are relatively low. As in 2001, Ukraine was considered to be a high risk for business and investment. Overall entrepreneurial sector in Ukraine was very weak. Inappropriate accounting standards prevented the assessment of creditworthiness. Corporate governance has been recognized outside of transparency and open to abuse.

This can be illustrated by the fact that in 2000 Ukraine has managed to attract only 792.2 million dollars of direct foreign investment. In the same year residents seized assets worth 189.6 million dollars. As of 01.01.2001, the total foreign investment in the country was 3 865.5 million, corresponding indicator only $ 78 dollars per capita[20]. This figure clearly shows that the Ukrainian market was unattractive to investors at the beginning of the project.

How unattractive investment climate was in Ukraine can be seen especially in comparison with neighboring countries. For example, geographically much smaller Czech Republic at the end of 2000 attracted 21.6 billion U.S. dollars, Poland managed to attract 34.2 billion U.S. dollars of foreign direct investment[21].

2. Technological barriers

The project activities require considerable modernization of the plant. The project presumes the installation of new, technically complex equipment having which, in order to achieve planned goals on power efficiency, requires the high qualification of maintenance personnel.

Complexity of the production process and the suggested measures, constant fluctuations of the cost of energy resources in Ukraine do not allow to predict energy and economic results of the implementation of measures within the framework of this project. The uncertainity of results leads to additional risks for the project owner.

[19] http://ukrstat.gov.ua/operativ/operativ2005/vvp/vvp_ric/vvp_e.htm
[20] Ukrstat.gov.ua
[21] http://unctadstat.unctad.org/TableViewer/tableView.aspx

Sub-step 3b. Inquiring if revealed barriers will not prevent the implementation of any scenarios (except the proposed project)

Neither financial nor technological barriers will prevent the baseline. PJSC "Central Ore Mining and Processing Plant" will not need investments for modernization, it can continue to buy natural gas and electric power from the state for production needs. According to the baseline the plant does not need modernization and can continue to use its technical equipment following operational instructions and maintenance processes.

Joint implementation mechanisms allow to obtain funds for planned project modernization, which allows to eliminate the financial restrictions for the proposed project. Many high-qualified specialists from leading foreign and Ukrainian companies are involved in the realization of the project. It allows to minimize technological barriers mentioned.

Step 4. Common practice analysis

Sub-step 4a.Analysis of other projects similar to the proposed joint implementation project.

On such enterprises as PJSC "Poltava Iron Ore Enrichment Works", PJSC "Central Iron Ore Enrichment Works", PJSC "Eastern Iron Ore Enrichment Works" were implemented the complexes of similar measures. All the mentioned enterprises considered JI mechanism as the decisive factor in the implementation of the complex of measures. Similar projects without the JI mechanism were not implemented in Ukraine.

Sub-step 4b. Discussion of other similar active projects

Other similar projects are not being realized without JI mechanism.

Conclusion: the realization of the project will allow to reduce greenhouse gas emissions into the atmosphere, that cannot be achieved otherwise. Any reduction of harmful emissions into the atmosphere achieved within the range of joint implementation project will be additional

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

The project boundary was defined for each subproject separately.

1. Modernization of iron ore concentrate production

These subproject boundaries within the project and baseline encompass emissions that refer to electric energy consumption from UETG.

2. Modernization of pellets production

These subproject boundaries within the project and baseline encompass:

- emissions that refer to natural gas combustion by technological equipment during pellets production;
- emissions that refer to electric energy consumption from UETG.

Geographical boundaries of the project encompass physical (geographic) location of the emissions source. Project boundaries coincide with the physical boundaries of PJSC "Central Ore Mining and Processing Plant" and energy enterprise that generates electric energy for PJSC "Central Ore Mining and Processing Plant" production needs.

Technological vehicles and production equipment of PJSC "Central Ore Mining and Processing Plant" are emission sources of this JI project, this means that all the emission sources are under the control of project participants.

GHG emissions are connected with fossil fuel combustion for production needs of the enterprise. The main emissions caused by fossil fuel combustion are CO_2 emissions; CH_4 and N_2O emissions are insufficient and are not included.

Table 7. Project boundary for each subproject

	Source	Gas	Included?	Justification/Explanation
Subproject "Modernization of iron ore concentrate production"				
Baseline	Electric energy consumption during iron ore concentrate production	CO_2	Yes	Main source of emissions
		CH_4	No	Insufficient emissions
		N_2O	No	Insufficient emissions
Subproject "Modernization of pellets production"				
Baseline	Natural gas consumption during pellets production	CO_2	Yes	Main source of emissions
		CH_4	No	Insufficient emissions
		N_2O	No	Insufficient emissions
	Electric energy consumption during pellets production	CO_2	Yes	Main source of emissions
		CH_4	No	Insufficient emissions
		N_2O	No	Insufficient emissions
Subproject "Modernization of iron ore concentrate production"				
Project scenario	Electric energy consumption during iron ore production	CO_2	Yes	Main source of emissions
		CH_4	No	Insufficient emissions
		N_2O	No	Insufficient emissions
Subproject "Modernization of pellets production"				
Project scenario	Natural gas consumption during pellets production	CO_2	Yes	Main source of emissions
		CH_4	No	Insufficient emissions
		N_2O	No	Insufficient emissions
	Electric energy consumption during pellets production	CO_2	Yes	Main source of emissions
		CH_4	No	Insufficient emissions
		N_2O	No	Insufficient emissions

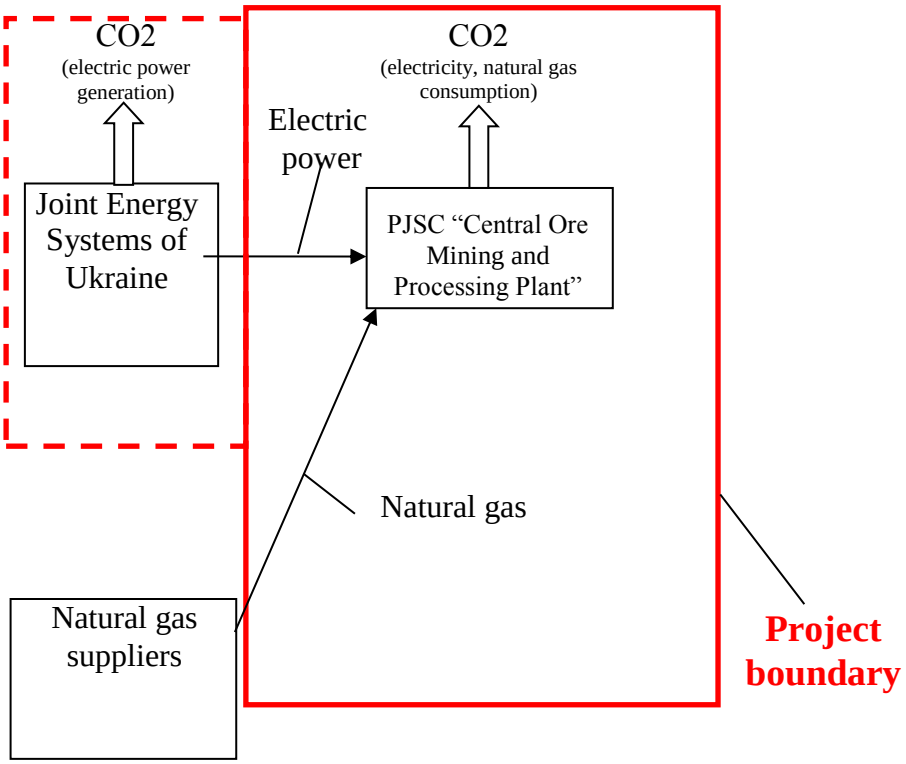

Fig. 9 Project boundary for baseline scenario

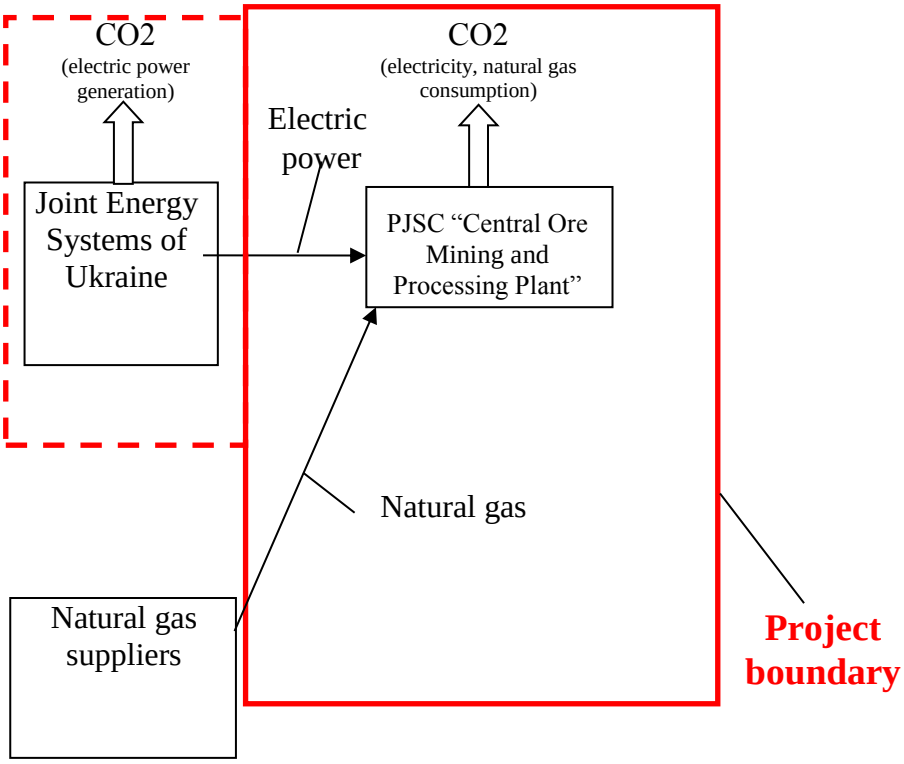

Fig. 10 Project boundary for project scenario

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

Date of baseline setting: 11/09/2012.

Persons setting the baseline:

Name of company:	PJSC “Central Ore Mining and Processing Plant” - project participant
Address:	Ukraine, 50066, Dnipropetrovsk region, Kryvyi Rih city
City:	Kryvyi Rih
Country:	Ukraine
Telephone:	+38 (0564)-06-83-01
Fax:	+38 (0564) 06-85-25
e-mail:	cgok@cgok.dp.ua

SECTION C. Duration of the project / crediting period

C.1. Starting date of the project:

The proposed joint implementation project consists of 2 subprojects, every subproject includes several stages.

Starting date of the joint implementation project is 01 January 2003.

The period which goes after the first commitment period is 8 years (96 months) from January 1 2013 to December 31 2020

C.2. Expected operational lifetime of the project:

Expected operational lifetime of the project is at least 19 years (228 months).

C.3. Length of the crediting period:

17 (seventeen) years, that is 204 (two hundred and four) months.

Beginning of the crediting period is 01 January 2004. During the period from 01 January 2004 till 31 December 2007 the assigned amount units (AAUs) will be generated, the duration of the period is 4 years (48 months).

Emission reduction units (ERU) are referred to the first commitment period under Kyoto Protocol that is 5 years (60 months), from 01 January 2008 till 31 December 2012

In case if after the first commitment period under Kyoto Protocol it will be prolonged, the crediting period may be extended till the finalization of expected project operational lifetime.

SECTION D. Monitoring plan

D.1. Description of monitoring plan chosen:

In accordance with annex 1 to the JI guidelines and following the guidance on criteria for baseline setting and monitoring[22] version 3, the monitoring plan is described below, using the following step-wise approach. However, the monitoring plan, is totally based on the JI specific approach , which was listed as a JI specific approach.

Step 1 Indication and description of the approach chosen regarding monitoring

There is no approved CDM baseline and monitoring methodology which is applicable – without revisions being applied – to abandoned mines. Therefore, a JI specific approach (a) is applied.

JI specific approach

In accordance with the guidance the monitoring plan shall provide for:
(i) The collection and archiving of all relevant data necessary for estimating or measuring anthropogenic emissions of GHGs occurring within the project boundary during the crediting period;
(ii) The collection and archiving of all relevant data necessary for determining the baseline of anthropogenic emissions of GHGs within the project boundary during the crediting period;
(iii) The identification of all potential sources of, and the collection and archiving of data on increased anthropogenic emissions of GHGs outside the project boundary that are significant and reasonably attributable to the project during the crediting period. The project boundary shall encompass all anthropogenic emissions of GHGs under the control of the project participants that are significant and reasonably attributable to the JI project;
(iv) The collection and archiving of information on environmental impacts, in accordance with procedures as required by the host Party, where applicable;
(v) Quality assurance and control procedures for the monitoring process;
(vi) Procedures for the periodic calculation of the reductions of anthropogenic emissions by the proposed JI project, and for leakage effects, if any. Leakage is defined as the net change of anthropogenic emissions of GHGs which occurs outside the project boundary, and that is measurable

[22] *Guidance on criteria for baseline setting and monitoring, version 03 (JISC 26).*

and attributable to the JI project;
(vii) Documentation of all steps involved in the calculations referred to above.

Step 2 Application of the approach chosen

The monitoring plan for this project was chosen according to the"Guidance on criteria for baseline setting and monitoring" (version 03). In accordance with the requirements of this document, the choice of the monitoring plan was based on the specific approach, applied only for this particular joint implementation project, as it consists of several subprojects aimed at different key factors allowing greenhouse emissions reduction.

The monitoring plan, accepted for this joint implementation project, is aimed to ensure all data necessary for the determination of emission level according to the baseline and project scenario, and corresponding to the scope of emissions reduction due to this joint implementation project. The information about this project is set above.

The following documentations were used to establish the monitoring plan and emission level according to the baseline and project scenario:
- subproject "Modernization of iron ore concentrate production" – "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" (version 01)[23];
- subproject "Modernization of pellets production" – "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion" (version 02), concerning the part on reduction of natural gas specific consumption during the pellets production, and "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" (version 01), concerning the part on reduction of electric energy specific consumption during the pellets production.

Measuring equipment listed in the Ukrainian State Register of Measuring Equipment is used for the monitoring of the data that are needed to be measured. This equipment is subject to the periodic calibration.

[23] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-05-v1.pdf

D.1.1. Option 1 – Monitoring of the emissions in the project scenario and the baseline scenario:

D.1.1.1. Data to be collected in order to monitor emissions from the project, and how these data will be archived:

ID number *(Please use numbers to ease cross-referencing to D.2.)*	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e)	Recording frequency	Portion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
1. $EC_{iron\ ore,PC,y}$	the amount of electric energy consumption in the process of iron ore concentrate production during the year	Report on energy consumption	MWh	m	monthly	1	electronic/paper	Data should be archieved and stored for two years after the last ERUs transaction
2. $EF_{co2,elec}$	emission factor for UETG	Study "Standardized emission factors for the Ukrainian electricity grid" (Version 5) and the orders issued by the National Environmental Investment Agency of Ukraine	t CO_{2e}/ MWh	e	annually	1	electronic/paper	The same
3. $FC_{NG,PC,y}$	quantity of natural gas combustion in the process of pellets production during the year	Report on natural gas consumption	mil. m^3	m	monthly	1	electronic/paper	The same
4. $NCV_{NG,y}$	natural gas net	Certificate on natural	Tcal/mil. m^3	c	monthly	1	electronic/paper	The same

	calorific value in the project scenario	gas quality physical and chemical characteristics						
5. $OXID_{NG}$	factor of carbon oxidation during natural gas combustion	The National Inventory of Ukraine	mass or volume unit	e	annually	1	electronic/paper	The same
6. W_{NG}	the amount of carbon in natural gas	The National Inventory of Ukraine	t /TJ	e	annually	1	electronic/paper	The same
7. $EC_{pellets,PC,y}$	quantity of electric energy consumption used for pellets production during the year	Report on energy consumption	MWh	m	monthly	1	electronic/paper	The same

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

The project scenario emissions will be estimated according to the following formula:

$$PE_y = PE_{iron\ ore,y} + PE_{pellets,y}, \quad (1)$$

where:
PE_y – total emission levels during a year according to the project scenario, t CO_{2e};
$PE_{iron\ ore,y}$ – emissions, caused by the energy consumption in the process of iron ore concentrate production (subproject "Modernization of iron ore concentrate production"), t CO_{2e};
$PE_{pellets,y}$ – emissions, caused by the natural gas consumption in the process of pellets production (subproject "Modernization of pellets production"), t CO_{2e}.

Emissions will be calculated separately for each proposed subproject.

The formulas provided in the "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" (version 01) are used for calculation of the project emissions under the subproject "Modernization of iron ore concentrate production".

$$PE_{iron\ ore,y} = EC_{iron\ ore,PC,y} \cdot EF_{co2,elec}, \quad (1.1)$$

where:

$PE_{iron\ ore,y}$ – CO_2 emissions from energy consumption in process of iron ore concentrate production, t CO_{2e};
$EC_{iron\ ore,PC,y}$ – quantity of electricity consumed in process of iron ore concentrate production per year, MWh;
$EF_{co2,elec}$ – emission factor for UETG, t CO_{2e}/MWh.

Concerning natural gas combustion in process of pellets production the formulas provided in the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion" (version 02) are used for calculation of the project emissions under the subproject "Modernization of pellets production". In some parts of the calculations concerning electricity consumption in process of pellets production the formulas provided in the "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" (version 01) are used.

$$PE_{pellets,y} = PE_{pellets,NG} + PE_{pellets,elec}, \quad (1.2)$$

where:
$PE_{pellets,y}$ – CO_2 emissions from natural gas combustion and electricity consumption in process of pellets production, t CO_{2e};
$PE_{pellets,NG}$ – CO_2 emissions from natural gas combustion in process of pellets production, t CO_{2e};
$PE_{pellets,elec}$ – CO_2 emissions from electricity consumption in process of pellets production, t CO_{2e}.

$$PE_{pellets,NG} = FC_{NG,PC,y} \cdot 4{,}1868 \cdot NCV_{NG,y} \cdot EF_{co2,NG}, \quad (1.2.1)$$

where:
$FC_{NG,PC,y}$ – quantity of natural gas consumed in process of pellets production during the year, mil.m^3;
$NCV_{NG,y}$ – natural gas net calorific value in the project scenario, Tcal/mil.m^3;
$EF_{co2,NG}$ – emission factor from natural gas combustion, t CO_{2e}/TJ;
4,1868 – standardized coefficient for Tcal recalculation into TJ, TJ/Tcal.

$$EF_{co2,NG} = OXID_{NG} \cdot W_{NG} \cdot 44/12, \quad (1.2.1.1)$$

where:
$OXID_{NG}$ – factor of carbon oxidation during natural gas combustion, mass or volume unit;
W_{NG} – average mass fraction of carbon in natural gas, t/TJ;
44/12 – stechiometric ratio between molecular weight of CO_2 and carbon.

$$PE_{pellets,elec} = EC_{pellets,PC,y} \cdot EF_{co2,elec}, \quad (1.2.2)$$

where:
$EC_{pellets,PC,y}$ – quantity of electricity consumed in process of pellets production per year, MWh;
$EF_{co2,elec}$ – emission factor for UETG, t CO_{2e}/MWh.

1 t of CO_2 in all cases is equal to 1t of CO_2e.

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	Portion of data to be monitored	How will the data be archived? (electronic / paper)	Comment
8. $EF_{co2,elec}$	emission factor for UETG	"Operational Guidelines for Project Design Documents of Joint Implementation Projects. Volume 1: General guidelines" (Version 2.3), Study "Standardized emission factors for the Ukrainian electricity grid" (Version 5) and the orders issued by the National Environmental Investment Agency of Ukraine	t CO2 e/MWh	e	annually	1	electronic/paper	Data should be archieved and stored for two years after the last ERUs transaction
9. $SEC_{iron\ ore}$	specific electric energy consumption during iron ore concentrate production	fixed value based on the chronological data	MWh/t	c	fixed data	1	electronic/paper	The same
10. $P_{iron\ ore,\ y}$	the amount of iron	fact sheet on	t	c	monthly	1	electronic/paper	The same

	ore concentrate produced for the year *y*	goods turnover						
11. $NCV_{NG, BC}$	natural gas net calorific value in baseline	fixed value based on the chronological data	Tcal/mil. m^3	c	fixed data	1	electronic/paper	The same
12. $SFC_{pellets,NG,BC}$	natural gas baseline specific consumption during pellets production	fixed value based on the chronological data	mil. m^3/t	c	fixed data	1	electronic/paper	The same
13. $P_{pellets,y}$	amount of pellets produced for the year *y* in project scenario	fact sheet on goods turnover	t	c	monthly	1	electronic/paper	The same
14. $OXID_{NG}$	factor of carbon oxidation during natural gas combustion	The National Inventory of Ukraine	mass or volume unit	e	annually	1	electronic/paper	The same
15. W_{NG}	the amount of carbon in natural gas	The National Inventory of Ukraine	t /TJ	e	annually	1	electronic/paper	The same
16. $SEC_{pellets,elec,BC}$	electric energy specific consumption during baseline pellets production	fixed value based on the chronological data	MWh/t	c	fixed data	1	electronic/paper	The same

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

Baseline emissions will be estimated according the following formula:

$$BE_y = BE_{iron\ ore,y} + BE_{pellets,y}, \quad (2)$$

where:
BE_y – total emission levels during a year according to the baseline scenario, t CO_{2e};
$BE_{iron\ ore,y}$ – emissions, caused by the energy consumption in the process of iron ore concentrate production (subproject "Modernization of iron ore concentrate production"), t CO_{2e};
$BE_{pellets,y}$ – emissions, caused by the natural gas consumption in the process of pellets production (subproject "Modernization of pellets production"), t CO_{2e}.

Emissions will be calculated separately for each proposed subproject.

Concerning natural gas combustion in process of pellets production the formulas provided in the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion" (version 02) are used for calculation of the baseline emissions under the subproject "Modernization of pellets production". In some parts of the calculations concerning electricity consumption in process of pellets production the formulas provided in the "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" (version 01) are used.

$$BE_{pellets,y} = BE_{pellets,NG,y} + BE_{pellets,elec,y}, \quad (2.1)$$

where:
$BE_{pellets,y}$ – CO_2 emissions from natural gas combustion and electricity consumption in process of pellets production, t CO_{2e};
$BE_{pellets,NG,y}$ – CO_2 emissions from natural gas combustion in process of pellets production, t CO_{2e};
$BE_{pellets,elec,y}$ – CO_2 emissions from electricity consumption in process of pellets production, t CO_{2e}.

$$BE_{pellets,NG,y} = FC_{NG,BC,y} \cdot 4{,}1868 \cdot NCV_{NG,BC,y} \cdot EF_{co2,NG,y}, \quad (2.1.1)$$

where:
$FC_{NG,BC,y}$ – quantity of natural gas consumed in process of pellets production during the year, mil.m^3;
$NCV_{NG,BC,y}$ – natural gas net calorific value in baseline, Tcal/mil.m^3;
$EF_{co2,NG,y}$ – emission factor from natural gas combustion, t CO_{2e}/TJ;
4,1868 – standardized coefficient for Tcal recalculation into TJ, TJ/Tcal.

$$FC_{NG,BC,y} = SFC_{pellets,NG,BC} \cdot P_{pellets,y}, \quad (2.1.1.1)$$

where:
$SFC_{pellets,NG,BC}$ – natural gas baseline specific consumption during pellets production, mil. m^3/t;

$P_{pellets,y}$ – amount of pellets produced for the year *y* in project scenario, t.

$EF_{co2,NG,y} = OXID_{NG,y} \cdot W_{NG,y} \cdot 44/12$, (2.1.1.2)

where:
$OXID_{NG,y}$ – factor of carbon oxidation during natural gas combustion, mass or volume unit;
$W_{NG,y}$ – average mass fraction of carbon in natural gas, t/TJ;
44/12 – stechiometric ratio between molecular weight of CO_2 and carbon.

$BE_{pellets,elec,y} = EC_{pellets,BC,y} \cdot EF_{co2,elec,y}$, (2.2.2)

where:
$EC_{pellets,BC,y}$ – quantity of electricity consumed in process of pellets production in baseline, MWh
$EF_{co2,elec,y}$ – emission factor for UETG, t CO_{2e}/MWh.

$EC_{pellets,BC,y} = SEC_{pellets,elec,BC} \cdot P_{pellets,y}$, (2.2.2.1)

where:
$SEC_{pellets,elec,BC}$ – electric energy specific consumption during baseline pellets production, MWh/t;
$P_{pellets,y}$ – amount of pellets produced for the year *y* in project scenario, t.

1 t of CO_2 in all cases is equal to 1t of CO_2e.

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

D.1.2.1. Data to be collected in order to monitor emission reductions from the project, and how these data will be archived:								
ID number *(Please use numbers to ease cross-referencing to D.2)*	Data variable	Source of data	Data indicating unit	Measured (m), calculated (c), estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/paper)	Comment

Not applied to this project.

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):

Not applied to this project.

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

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

Not applied to this project. No leakage is expected since energy sources consumption is decreasing under the project activities, according to the baseline. The leakage from gas-transport system of Ukraine is expected to reduce during the implementation of the project. According to the requirements of the "Guidance on criteria for baseline setting and monitoring" (version 03) conservative approach is used for this project, where the leakage reduction is not applied for emission calculation.

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

Not applied to this project.

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

Annual emission reduction for the project will be estimated according to the following formula:

$$ER_y = BE_y – PE_y, \quad (3)$$

where:
ER_y – emissions reduction during a year due to project activities, t $CO_{2\,e}$;
PE_y – emissions during a year according to the project scenario, t $CO_{2\,e}$;
BE_y – emissions during a year according to the baseline, t $CO_{2\,e}$.

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:

This project will facilitate the reduction of energy sources consumption for PJSC "Central Ore Mining and Processing Plant" production, namely: diesel fuel during mining rock transportation, natural gas for pellets production, electric energy for iron ore concentrate and pellets production. The scheme of energy resources, fuel and oil materials at different technological stages envisaged by the project is presented at picture 7. The decrease in energy sources consumption will allow to reduce greenhouse gas emissions. Thus general environmental impact of the project is positive. According to the requirements of relevant state services, the PJSC "Central Ore Mining and Processing Plant" reports on ecological characteristics on periodic basis. It reports on NOx, SOx and dust emissions.

The development of documents, where amounts of emissions are justified, is made by institutions, organizations and agencies granted for such work and registered in relevant list of Ministry of Environmental Protection of Ukraine.

The relevant documentation and permits on pollutant emissions are archived and stored in the Environmental safety department of PJSC "Central Ore Mining and Processing Plant"; the copies of this documentation are archived and stored at monitoring team.

The monitoring data will be kept for two years after the last ERUs transaction connected with the project.

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.
$EC_{iron\ ore,PC,y}$	low	Quantity of electric energy consumption in the process of iron ore concentrate production during the

(D.1.1.1 – 5)		year is identified by the means of direct measurement, made by the electricity metering units. The electricity metering units used for measurements are a subject to the periodic calibration. Data are registered in the "Report on electricity consumption".
$EF_{co2,elec}$ (D.1.1.1 – 6, D.1.1.3 – 6)	low	Emission factor for UETG is identified according to the "Operational Guidelines for Project Design Documents of Joint Implementation Projects. Volume 1: General guidelines" (Version 2.3), study "Standardized emission factors for the Ukrainian electricity grid" (Version 5) and relevant orders, issued by the National Environmental Investment Agency of Ukraine. The research on defining the factor is held every year and the results are finalized in the corresponding orders.
$FC_{NG,PC,y}$ (D.1.1.1 – 7)	low	Quantity of natural gas combustion in the process of pellets production during the year is identified by the means of direct measurement, made by the gas metering units. The gas metering units used for measurements are a subject to the periodic calibration. Data are registered in the "Report on natural gas consumption".
$NCV_{NG,y}$ (D.1.1.1 – 8, D.1.1.3 – 9)	low	Natural gas net calorific value in the project scenario is identified according to the data presented in National Inventory Report of Ukraine. This document is the subject of the periodical review
$OXID_{NG}$ (D.1.1.1 – 9, D.1.1.3 – 12)	low	Factor of carbon oxidation during natural gas combustion is identified according to the National Inventory of Ukraine data. This document is subject to periodic revision and relevant corrective data amendments.
W_{NG} (D.1.1.1 – 10, D.1.1.3 – 13)	low	The amount of carbon in natural gas is identified according to the National Inventory of Ukraine data. This document is subject to periodic revision and relevant corrective data amendments.
$EC_{pellets,PC,y}$ (D.1.1.1 – 11)	low	Quantity of electric energy consumption in the process of pellets production during the year is identified by the means of direct measurement, made by the electricity metering units. The electricity metering units used for measurements are a subject to the periodic calibration. Data are registered in the "Report on electricity consumption".
$SFC_{diesel,BC}$ (D.1.1.3 – 2)	low	The quantity of diesel fuel combustion in mining rock transportation in baseline is a fixed value and is based on the chronological data on mining rock transportation during 3 years before the subproject implementation
$SEC_{iron\ ore}$ (D.1.1.3 – 7)	low	Baseline specific electric energy consumption during iron ore concentrate production is a fixed value and is based on the chronological data on iron ore concentrate production during 3 years before the subproject implementation
$P_{iron\ ore,\ y}$ (D.1.1.3 – 8)	low	The amount of baseline iron ore concentrate produced for the year y, The calculation of the produced iron ore concentrate amount is made according to the "Instructions on compiling the average monthly goods turnover balance of the metal in the mining and iron ore processing processes". The data are registered in the "Fact sheet on goods turnover"
$SFC_{pellets,NG,BC}$ (D.1.1.3 – 10)	low	Natural gas specific consumption during baseline pellets production in the baseline is a fixed value and is based on the chronological data on pellets production during 3 years before the subproject implementation.

$P_{pellets,y}$ (D.1.1.3 – 11)	low	The amount of pellets produced for the year y in the project scenario is identified by the means of direct measurement, made by the relevant measuring equipment. The measuring equipment used for measurements of produced pellets amount are a subject to the periodic calibration. The data are registered in the "Fact sheet on finished products turnover".
$SEC_{pellets,elec,BC}$ (D.1.1.3 – 14)	low	Electric energy specific consumption during baseline pellets production is a fixed value and is based on the chronological data on pellets production during 3 years before the subproject implementation.

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

The monitoring of data determined in the previous section will be performed within the framework of general operation of the project on energy-saving measures at the PJSC "Central Ore Mining and Processing Plant".

Technical personnel read the monitored data which are subject to measurements from metering units of particular energy source and make relevant notes in the technological registers; the monitoring data are registered automatically in electric form, where the automatic means of registration available. General data on energy resources consumption during a month is given in monthly reports according to the section D. 2 ("Report on materials consumption standard performance", "Report on electricity consumption", "Report on natural gas consumption", "Certificates on natural gas quality physical and chemical characteristics", "Fact sheet on finished products turnover") which are the documents of official accounting. Monthly reports are archived in electronic and paper forms at thereof monitoring group.

The Chairman of the Board of PJSC "Central Ore Mining and Processing Plant" appoints personnel responsible for operation and maintenance of technical equipment needed for the project. Their responsibilities also include registration of all data necessary for monitoring. The head of the monitoring group will be engineer of technical department of PJSC "Central Ore Mining and Processing Plant". The monitoring will be conducted in close collaboration with technical personnel and will include the monitoring itself and also analysis and archiving of all data indicated in the previous section. The responsibilities of the monitoring group will also include work coordination to estimate emissions reduction level. Under the order of the Head of the monitoring group, estimation of emission reduction shall be performed by the developer of Joint implementation project. Periodic data on energy resources consumption will be compared with relevant registered data taken from the technical personnel to approve data credibility. In case of inconsistency of these data the cause of its appearance must be found in collaboration with the technical personnel. If the discrepancy of monitoring data is found, monitoring system of relevant data must be corrected.

All information about monitoring and corrective measures must be archived for future verification of emissions reduction level. The head of the monitoring group is responsible for preparation and archiving of monitoring reports. The Chairman of the Board analyses general monitoring data and relevant documentation on periodic basis. The developer of the joint implementation project will assist in organization of the monitoring if the need arises.

The PJSC "Northern Iron Ore Enrichment Works" chief metrologist is responsible for acceptance of measurement equipment devices (energy resources metering units) in working condition and for their timely repair and calibration.

While main measuring equipment being repaired, monitoring data are taken by additional (back-up) measuring devices. The risk of needed for calculation monitoring data absence can be eliminated due to additional (back-up) measuring devices.

The monitoring management structure is shown in figure 8.

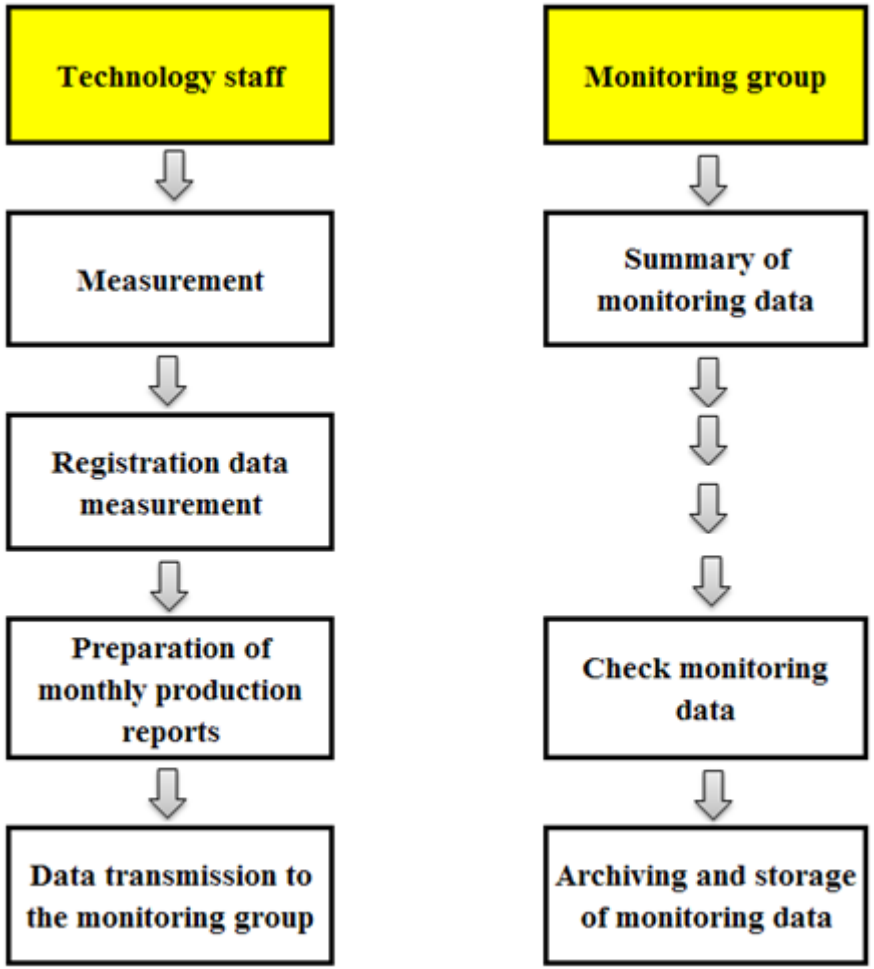

Fig. 11 – The monitoring management structure

The results measuring and archiving are responsibility of the technical personnel. Technical personnel submit the results of measurements to the monitoring group for work coordination to estimate greenhouse gases emissions reduction. Under the order of the Head of the monitoring group, estimation of emission reduction shall be performed by the developer of Joint implementation project. The functions of the monitoring group also include collection of non-measured data which are also subject to the monitoring. The monitoring group must make back-up copy of monitoring data which should be stored apart from the main data to avoid their loss in case of force majeure.

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

Persons setting the baseline:

Name of company:	PJSC "Central Ore Mining and Processing Plant" - project participant
Address:	Ukraine, 50066, Dnipropetrovsk region, Kryvyi Rih city
City:	Kryvyi Rih
Country:	Ukraine
Telephone:	+38 (0564)-06-83-01
Fax:	+38 (0564) 06-85-25
e-mail:	cgok@cgok.dp.ua

SECTION E. Estimation of greenhouse gas emissions reduction

E.1. Estimated project emissions:

Project emissions are estimated according to the formula described in D.1.1.2.

Table 8. Estimated project emissions for the period preceding the first commitment period (January 1, 2004– December 31, 2007)

Year	Estimated project emissions ($t CO_{2 e}$)
2004	155527
2005	150018
2006	787392
2007	807972
Total	1900909

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

Year	Estimated project emissions ($t CO_{2 e}$)
2008	885664
2009	833160
2010	957855
2011	970618
2012	970618
Total	4617915

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

Year	Estimated project emissions ($t CO_{2 e}$)
2013	970618
2014	970618
2015	970618
2016	970618
2017	970618
2018	970618
2019	970618
2020	970618
Total	7764944

E.2. Estimated leakage:

Not applied to this project.

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

The sum of E.1. and E.2. is equal to E.1.

E.4. Estimated baseline emissions:

Baseline emissions are estimated according to the formula described in D.1.1.4.

Table 11. Estimated baseline emissions for the period preceding the first commitment period (January 1, 2004– December 31, 2007)

Year	Estimated baseline emissions ($t CO_{2 e}$)
2004	165719
2005	167298
2006	834327
2007	880066
Total	2047410

Table 12. Estimated baseline emissions during the first commitment period (January 1, 2008 – December 31, 2012)

Year	Estimated project emissions ($t CO_{2 e}$)
2008	993205
2009	925209
2010	1075843
2011	1089501
2012	1089501
Total	5173259

Table 13. Estimated project emissions for the period following the first commitment period (January 1, 2013. – December 31, 2020)

Year	Estimated project emissions ($t CO_{2 e}$)
2013	1089501
2014	1089501
2015	1089501
2016	1089501
2017	1089501
2018	1089501
2019	1089501
2020	1089501
Total	8716008

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

Table 14. Estimated emission reductions for the period, preceding the first commitment period (January1, 2004– December 31, 2007)

Year	Estimated emission reductions ($t CO_{2 e}$)
2004	10192
2005	17280
2006	46935
2007	72094
Total	146501

Table 15. Estimated emission reductionsduring the first commitment period (January1, 2008– December 31, 2012)

Year	Estimated project emissions ($t CO_{2 e}$)
2008	107541
2009	92049
2010	117988
2011	118883
2012	118883
Total	555344

Table 16. Estimated emission reductionsfor the period, after the first commitment period (January 1, 2013 - December 31, 2020)

Year	Estimated project emissions ($t CO_{2 e}$)
2013	118883
2014	118883
2015	118883
2016	118883
2017	118883
2018	118883
2019	118883
2020	118883
Total	951064

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

Table. 17. Table, containing results of emission reductions estimations for the period, preceding the first commitment period (January1, 2004– December 31, 2007)

Year	Estimated project emissions ($t CO_{2 e}$)	Estimated leakage ($t CO_{2 e}$)	Estimated baseline emissions ($t CO_{2 e}$)	Estimated emission reductions ($t CO_{2 e}$)
2004	155527	0	165719	10192
2005	150018	0	167298	17280
2006	787392	0	834327	46935
2007	807972	0	880066	72094
Total	1900909	0	2047410	146501

Table 18. Table, containing results of emission reductions estimations during the first commitment period (January1, 2008– December 31, 2012)

Year	Estimated project emissions (t $CO_{2\,e}$)	Estimated leakage (t $CO_{2\,e}$)	Estimated baseline emissions (t $CO_{2\,e}$)	Estimated emission reductions (t $CO_{2\,e}$)
2008	885664	0	993205	107541
2009	833160	0	925209	92049
2010	957855	0	1075843	117988
2011	970618	0	1089501	118883
2012	970618	0	1089501	118883
Total	4617915	0	5173259	555344

Table 19. Table, containing results of emission reductions estimations for the period, after the first commitment period (January 1, 2013 - December 31, 2020)

Year	Estimated project emissions (t $CO_{2\,e}$)	Estimated leakage (t $CO_{2\,e}$)	Estimated baseline emissions (t $CO_{2\,e}$)	Estimated emission reductions (t $CO_{2\,e}$)
2013	970618	0	1089501	118883
2014	970618	0	1089501	118883
2015	970618	0	1089501	118883
2016	970618	0	1089501	118883
2017	970618	0	1089501	118883
2018	970618	0	1089501	118883
2019	970618	0	1089501	118883
2020	970618	0	1089501	118883
Total (t $CO_{2\,e}$)	7764944	0	8716008	951064

SECTION F. Environmental impact

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

The proposed JI project will make positive environmental impact due to the reduction of energy resources consumption for the production needs of PJSC "Central Ore Mining and Processing Plant" which will result in the decrease of greenhouse emissions into the atmosphere.

Emissions reduction will take place due to this project realization, namely:

- subproject "Modernization of iron ore concentrate production" will allow to reduce the electricity consumption needed for ton of iron ore concentrate production. Energy specific consumption reduction will allow to decrease the amount of energy consumption out of UETG, this will allow to reduce the fossil fuel combustion needed for energy production at Ukrainian energy enterprises;
- subproject "Modernization of pellets production" will allow to reduce the specific consumption of electric energy and specific consumption of natural gas per ton of produced pellets. The decrease in quantity of natural gas combustion needed for pellets production will let to reduce the GHG emissions. Energy consumption reduction will allow to decrease the amount of energy consumption out of UETG, this will lead to the reduction of fuel consumption needed for energy production thus causing the GHG emissions reduction at Ukrainian energy enterprises.

Emissions reduction achieved due to this project implementation will have an impact on the environment of Ukraine but does not influence greenhouse gases emissions abroad.

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

The realization of this project has facilitated the reduction of pollutant emissions from stationary sources. According to the issued permit of the Administration of ecological resources in Dnipropetrovsk region the environmental impact is not sufficient, but generally positive.

According to the requirements of the Ukrainian legislation in force, namely the law of Ukraine "On environmental protection" #1264-XII[24] dated 25.06.1991 and SCN (DBN in ukrainian transcription) A.2.2-1[25], the implementation of this project does not demand ecological assessment.

[24] http://zakon1.rada.gov.ua/cgi-bin/laws/main.cgi?page=1&nreg=1264-12
[25] ДБН А.2.2-1-2003 "Structure and contents of the environmental impact assessment (EIA) materials during design and construction of enterprises, buildings and facilities"

SECTION G. Stakeholders' comments

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

The host Party does not require consultations with stakeholders for joint implementation projects.

Stakeholders' comments will be collected during publishing of the project within the determination procedure.

Annex 1

CONTACT INFORMATION ON THE PROJECT PARTICIPANTS

Organisation:	PJSC “Central Ore Mining and Processing Plant” - project participant
Street/P.O.Box:	-
Building:	-
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State/Region:	Dnipropetrovsk region
Postal code:	50066
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Fax:	+38 (0564) 06-85-25
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Salutation:	
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Middle name:	Genadiyovych
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Organisation:	Metinvest International SA
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State/Region:	
Postal code:	1201
Country:	Switzerland
Phone:	+41 22 906 18 28
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E-mail:	info@metinvestholding.com
URL:	http://sales.metinvestholding.com/en/contacts/misa
Represented by:	
Title:	General director
Salutation:	Mr.
Last Name:	Maksymovych
Middle Name:	
First Name:	Marian
Department:	
Phone (direct):	+41 22 906 18 28
Fax (direct):	+41 22 906 18 29
Mobile:	
Personal e-mail:	info@metinvestholding.com

Annex 2

BASELINE INFORMATION

The baseline for this project was chosen according to the "Guidance on criteria for baseline setting and monitoring" (version 03), the choice of the baseline was founded on the specific approach, applied only for this particular joint implementation project. The description and justification of the baseline scenario are given in the section B.1 of this document.

The current situation at PJSC "Northern Iron Ore Enrichment Works" was taken as the baseline without any modernization activity according to the project.

Main baseline emissions are CO_2 emissions, resulting from:

- electric power consumption from UETG for pellets and iron ore concentrate production;
- natural gas consumption for pellets production.

Under the baseline chosen, emissions were calculated according to the formula, given in the section D.1.1.4 of this document.

Annex 3

MONITORING PLAN

The monitoring plan for this project was chosen according to the "Guidance on criteria for baseline setting and monitoring" (version 03). The choice of the monitoring plan was based on the specific approach, applied only for this particular joint implementation project.

The monitoring plan is determined in the section D of this document.