JOINT IMPLEMENTATION PROJECT

"Modernization and technical reequipment of PJSC" Centrenergo TPP "

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

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PS

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

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PJSC "Centrenergo" (signature) **O.M. Chmyrenko**

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PS

Kiev – 2012

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

CONTENTS

A. General description of the project.

B. Baseline

C. Duration of the project / crediting period

D. Monitoring plan

E. Estimation of greenhouse gas emission reductions

F. Environmental impacts

G. Stakeholders' comments

Annexes

Annex 1: Contact information on project participants

Annex 2: Baseline information

Annex 3: Monitoring plan

SECTION A. General description of the project

A.1. Title of the project:

Modernization and technical reequipment of PJSC "Centrenergo" TPP

Sectoral scope:
Sector 1 - Energy industry (renewable / nonrenewable energy resources)

PDD Version: 02.
Date: 08/10/2012.

A.2. Description of the project:

The main goals of project activity

The main purpose of the Joint Implementation Project (hereinafter - JIP) entitled "Modernization and technical reequipment of PJSC "Centrenergo" TPP" is reduction of greenhouse gas emissions by modernization of technological equipment used in the course of electricity generation at TPP.

Historical details of PJSC "Centrenergo" development and description.

Public Joint Stock Company "Centrenergo" is the legal successor of Open Joint Stock Company "State Energy Generating Company "Centrenergo" created from State Joint Stock energy generation company "Centrenergo", according to the General Meeting of shareholders on July 23, 1998, created by corporatization, according to the order of the Ministry of Energy and Electrification of Ukraine on August 31, 1995 № 174 and the Presidential Decree on April 4, 1995 № 282/95.

In 2011 Open Joint Stock Company "State Energy Generating Company "Centrenergo" was renamed into Public Joint Stock Company "Centrenergo".

Code in the Unified State Register of Enterprises and Organizations of Ukraine – 22927045

Name of activities under the Foreign-Economic Activities Code:

40.11.0 - Electricity generation
40.30.0 - Steam and hot water supply

The situation existing prior to the project activity

Prior to the proposed project PJSC "Centrenergo" implemented only measures aimed at maintaining the main technological equipment in working order. Factors that hindered the modernization work:

1. Limited financing of existing system modernization work.
2. Underdeveloped regulatory base, which was unable to regulate the functionality for implementation of energy-efficient measures in the system of heat and electricity generation.

The baseline scenario.

The scenario is based on the assumption that the company will continue to use existing equipment conducting routine repair work without significant capital investment. Based on this assumption, the unit cost of fossil fuels for electricity production will remain constant, resulting in the release of greenhouse gases at a level prior to the project years. Justification of the baseline scenario is described in Section B.

Project scenario.

The project provides for the modernization of technological equipment based on the use of more efficient production technologies and equipment. As a result the project implementation will increase fuel consumption efficiency and will reduce greenhouse gas emissions compared to baseline scenario.

Historical details of the development of the JIP

13/03/2000 – date when PJSC "Centrenergo" started implementation of project measures in introducing of modernization of technological equipment and improvement of its efficiency, reliability and safety rates.
03/04/2000 – Project design document development for the project activities.
01/10/2012 – The State Environmental Investment Agency of Ukraine issued a Letter of Endorsement № 2812/23/7.

The project design document of the project "Modernization and technical reequipment of PJSC "Centrenergo" TPP" is developed by CEP Carbon Emissions Partners S.A. according to JI projects based on requirements to JI projects according to paragraph 9 (a) of "Guidance on criteria for baseline setting and monitoring" (Version 03) based on:

- Data presented by PJSC "Centrenergo";
- Data of the UN Framework Convention on Climate Change;
- Data of the National Bank of Ukraine;
- Data of "National inventory report of anthropogenic greenhouse gas emissions by sources and removals by sinks in Ukraine in 1990-2010"

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)	• PJSC "Centrenergo"	No
Switzerland	• CEP Carbon Emissions Partners S.A.	No
* Please indicate if the Party involved is a host Party.		

Contact information on project participants and parties involved is provided in Annex 1.

A.4. Technical description of the project:

A.4.1. Location of the project:

The structure of PJSC "Centrenergo" includes: Trypilska TPP, Vuglegirska TPP, Zmyivska TPP.

Figure 1. Location of TPP PJSC "Centrenergo" on the map of Ukraine

A.4.1.1. Host Party(ies):

The project is located in Ukraine.
Ukraine is an Eastern European country that ratified the Kyoto Protocol to the UN Framework Convention on Climate Change on February 4, 2004[1]. It is listed in the Annex B of the Kyoto Protocol to the UN Framework Convention on Climate Change[2].

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

Trypilska TPP – Kyiv reion;
Vuglegirska TPP – Donetsk region;
Zmyivska TPP – Kharkiv region.

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

Trypilska TPP – Ukrainka city;
Vuglegirska TPP – Svitlodarsk city;
Zmyivska TPP – Komsomolske township.

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

The project is implemented in the territory of Kyiv, Kharkiv and Donetsk regions.
1. Trypilska TPP located in Ukrainka city, Kyiv regoin.Coordinates of Trypilska HES: 50 ° 09 '00" N, 30 ° 45' 07" E.
2. Vuglegirska TPP located in Svitlodarsk city, Donetsk region. Coordinates of Vuglegirska HES: 48 ° 26 '07" N, 38 ° 13' 15" E.

[1] http://zakon.rada.gov.ua/cgi-bin/laws/main.cgi?nreg=1430-15
[2] http://zakon.rada.gov.ua/cgi-bin/laws/main.cgi?page=1&nreg=995_801

3. Zmyivska TPP located in Komsomolske township, Kharkiv region. Coordinates of Zmyivska HES: 49 ° 35 '35" N, 36 ° 31' 26" E.

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

The main milestones of modernization of technological equipment for electricity generation are shown below; full list of measures will be presented during the monitoring report of JIP.

The project provides for the reduction of fossil fuel consumption by modernization of technological equipment used in the course of electricity generation at TPP.

1. Improvement of turbine rotor blades.

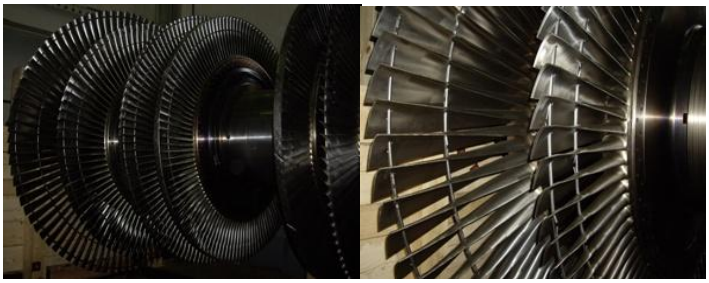


Figure 2. Rotor blades.

Rotor blades are an integral part of the rotor used to convert the kinetic and potential energy of the gas flow into mechanical work.

Improvement of turbine rotor blades leads to an increase in the capacity of electricity production, by increasing the efficiency of the equipment. Increase of the efficiency of the equipment will increase the efficiency of fossil fuel that will reduce GHG emissions.

Technology of recovery of rotor blades consists of the following operations:

1. Detection - is non-destructive control methods (ultrasonic, eddy current, capillary, etc.).
2. Technological operations:
   - applying of modernized diaphragms with high profiles of guide vanes and improved meridional contours;;
   - • applying of improved rotor blades with whole milling shroud flange and the ring ligation;
   - • optimization of the meridional contours of rotor blades;
   - • reduction of losses in the levels by using the optimal value of the axial gap formed shroud flange, thereby increasing efficiency and reducing the aerodynamic forces acting on the rotor blades
   - introduction of throttle axial radially over radial seals that maintain high efficiency during operation and eliminates lateral aerodynamic forces.

3. Quality control of the restored blade non-destructive methods of control.

2. Modernization of the high-pressure pump using repair kit, which includes new liquid end (impellers, guide vanes, shafts).

The project provides for the modernization of high-pressure pump repair kit with European manufacturers and their counterparts of domestic production, the technical characteristics of which are shown at the manufacturers website[3].

[3] http://www.remhidromash.com.ua/

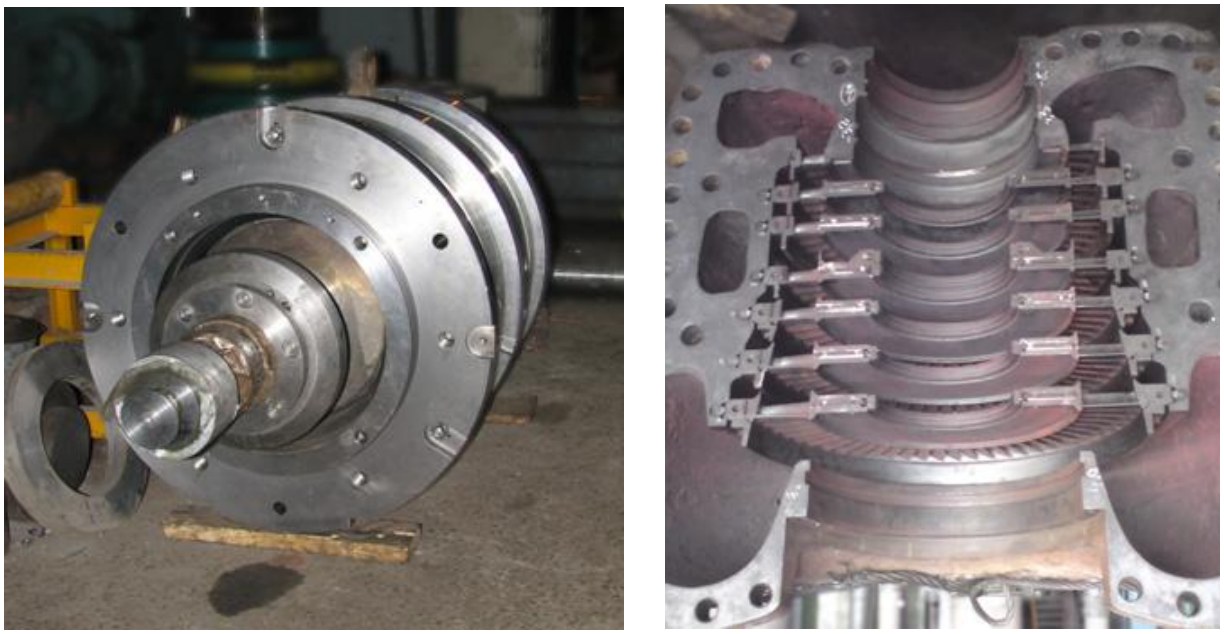


Figure 3. Left to right: upgraded liquid end before high-pressure pumps with triggering devices; overhaul repair of drive turbine of feed pumps.

Replacement of flow path leads to a significant increase in pump efficiency and thus reduces specific energy consumption of devices, which in turn leads to a reduction of greenhouse gas emissions.

3. Optimization of the network and the circulation pumps, blower fans and smoke exhauster.

This group of measures includes:

- The use of soft starters.
- Expansion of the working area of the equipment by removing restrictions on closing the throttle operation.
- Reduction of the load on the equipment in idle mode by going into a deep throttling.
- Increase the overall efficiency of equipment through the introduction of group pressure control and performance.
- Reduction of consumption of cooling water.
- Identification of reserves through the analysis of the process.
- Reduction of losses from downtime due to advanced diagnostic tools, etc.

One of the effective measures is the introduction of soft starters based on electric start engine[4]. Electric start system designed for electric start of equipment according to the timeline, which is implemented by the control unit for electric starter control signals from the automatic control system.

The main steps of the project

Table 1. Schedule of project implementations.

Steps	Year												
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
1*													
2													
3													

* names of the steps of the project are listed below

1. Modernization of technological equipment for electricity generation;

[4] http://www.aviamotor.ru/projects/detail.php?ID=1130

2. Generation of AAUs;
3. Generation of ERUs.

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

The project activities provides for modernization of technological equipment for electricity generation. Implementation of the project activities will increase the efficiency of fossil fuel consumption, which in turn will reduce GHG emissions.

GHG emission reduction will not take plase without the project activity because no national or sectoral policy does not specify the implementation of this kind of measures in heat and electricity generation system, aimed at GHG emission reduction. According to this, it is unlikely that without the implementation of the project the company will implement measures to reduce GHG emissions, and will continue "business as usual" in accordance with national, sectoral policies.

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

Table 2. Estimated amount of emission reductions for the period preceding the first commitment period

	Years
Length of the crediting period	4
Year	Estimate of annual emission reductions in tones of CO_2 equivalent
2004	345 478
2005	432 520
2006	830 936
2007	1 513 463
Total estimated emission reductions for the period preceding the first commitment period (tonnes of CO_2 equivalent)	**3 122 397**
Annual average of estimated emission reductions for the period preceding the first commitment period (tonnes of CO_2 equivalent)	780 599

Table 3. Estimated amount of emission reductions over the first commitment period

	Years
Length of the crediting period	5
Year	Estimate of annual emission reductions in tonnes of CO_2 equivalent
2008	1 421 680
2009	1 589 374
2010	1 845 764
2011	2 125 952
2012	2 125 952
Total estimated emission reductions over the first	**9 108 722**

commitment period (tonnes of CO2 equivalent)	
Annual average of estimated emission reductions over the first commitment period (tonnes of CO2 equivalent)	1 821 744

Table 4. Estimated amount of emission reductions for the period following the first commitment period

	Years
Length of the crediting period	5
Year	Estimate of annual emission reductions in tonnes of CO_2 equivalent
2013	2 125 952
2014	2 125 952
2015	2 125 952
2016	2 125 952
2017	2 125 952
Total estimated emission reductions for the period following the first commitment period (tonnes of CO2 equivalent)	**10 629 760**
Annual average of estimated emission reductions for the period following the first commitment period (tonnes of CO2 equivalent)	2 125 952

More detailed information is provided in the Supporting Document 1.

Description of formulas used to estimate emission reduction units is given in Section D and in the Supporting Document 1.

Accredited Independent Entity was provided with Supporting Document 1 (Excel file) to pass determination.

A.5. Project approval by the Parties involved:

A Letter of Endorsement № 2812/23/7 dated 01/10/2012 of the JI project "Modernization and technical reequipment of PJSC "Centrenergo" TPP" was issued by the State Environmental Investment Agency of Ukraine.
After analysis of the project, the PDD and Determination report will be submitted to the State Environmental Investment Agency of Ukraine for receiving a Letter of Approval.

SECTION B. Baseline

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

Stepwise approach was used to justify the baseline scenario:
The following steps were applied to determine the most plausible baseline scenario:
1. Determination of the plausible alternatives that could be the baseline scenario.
2. Justification of ruling out the alternatives that are improbable from technical and (or) economic perspectives.

Step 1. Identification and description of the approach chosen to establish the baseline scenario.

Among the approved CDM methodologies similar to the proposed project are the following methodologies:

- the consolidated baseline and monitoring methodology ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources"[5].
- the consolidated baseline and monitoring methodology ACM 0011 "Consolidated baseline methodology for fuel switching from coal and/or petroleum fuels to natural gas in existing power plants for electricity generation"[6].
- the baseline and monitoring methodology ACM 0061 "Methodology for rehabilitation and/or energy efficiency improvement in existing power plants"[7]

However these methodologies are directed at the use of renewable energy sources (ACM0002) and at switch from the more carbon intensive fuel to the less carbon intensive fuel (ACM0011), that does not correspond to the project activity. The closest methodology to the proposed project is baseline and monitoring methodology ACM 0061"Methodology for rehabilitation and/or energy efficiency improvement in existing power plants".
This methodology is applicable to project activities that implement rehabilitation and/or energy efficiency improvement measures for electricity generation. Investments in joint implementation project in the context of this methodology include energy efficiency measures of working TPP and / or rehabilitation to improve power units without adding new generating capacity.
However, this methodology also does not completely respond to the conditions of the project activity:

- In accordance with methodology ACM 0061 emission reductions within the frames of project activity take place on condition that emission factor of the power grid is higher, than emission factor of the power plant. Otherwise, the additional to the average history level production of electric power does not lead to emission reductions.
- The methodology ACM 0061 does not deal with GHG emission reduction in conditions of increase of fuel carbon intensity.

Thus, among the approved baseline and monitoring methodologies there is no suitable for the proposed project.
The proposed project uses the specific approach to JI projects based on requirements to JI projects according to paragraph 9 (a) of "Guidance on criteria for baseline setting and monitoring" (Version 03[8]).
The specific approach chosen for proposed project is based on:

- Historical data for the period since 1993 to 1999 using the least squares method.

[5] http://cdm.unfccc.int/UserManagement/FileStorage/DYPFI935XBG274NWH6O8CM1KEZR0VU

[6] http://cdm.unfccc.int/UserManagement/FileStorage/1WS8W1641K25AZ8E9L80V1RS3TAVWK

[7] http://cdm.unfccc.int/UserManagement/FileStorage/9K6GRQITX27OVG3CAS2MVDN1IWXJX1

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

- Data "National inventory report of anthropogenic greenhouse gas emissions by sources and removals by sinks in Ukraine in 1990-2010"[9]. At present 80% of the units of thermal power generation in Ukraine worked out (200 thousand hours). Half of the Ukrainian power is far beyond the permissible limits (block № 1 Zmyivska TPP at 1 January 2009 has worked 297 thousand hours), even young power in Ukraine Zuevskaya TPP (28) has workeded about 150 thousand hours.
- Data of the Ministry of Energy and Coal Industry of Ukraine[10]. Specific fuel for electricity generation at TPP (in Ukraine as a whole) compared with 1991 increased by approximately 17%.

According to the data above the linear increase in specific fuel consumption, which was based on historical data using the method of least squares on the methodology of PDD developer, will stop to grow, based on the principle of conservatism, the worst performance in achieving specific fuel consumption in the industry, as it values most clearly meets the baseline without introducing measures to improve maintenance of generating equipment.

Step 2. Application of the approach chosen

Sub-step 2a. Identification and listing of plausible alternative baseline scenarios.

The choice of the plausible baseline scenario is based on assessment of alternative gas pipeline repair of NJSC "Chornomornaftogaz" that potentially could have taken place as of the beginning of the project. To identify all realistic and plausible alternatives all the options that meet the applicable laws and regulations were taken into account. These options are the following alternatives:
Alternative 1.1: Continuation of the current situation, without the JI project implementation.
Alternative 1.2: The proposed project activity without the use of the Joint Implementation mechanism.

Sub-step 2b. Assessment of alternative scenarios
Alternative 1.1
Continuation of existing practices with minimum repairs to maintain performance of power units at the same level on the background of total degradation of TPP. Alternative 1.1, is the most plausible baseline scenario, as :
• No investment in new technological equipment and personnel training needed to work with new devices and systems of collection, accounting and storage of information is needed;
• No technological barriers, so that the equipment operated by skilled personnel, and additional retraining is not required;
- This scenario reflects customary practice in Ukraine.
Accordingly, *Alternative 1.1* can be viewed as the most plausible baseline scenario.

Alternative 1.2
The project activities without the use of joint implementation mechanism. In this case there are two barriers: investment barrier (see more details in Section B2) because this scenario requires additional substantial

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

[10] http://mpe.kmu.gov.ua/fuel/control/uk/publish/article;jsessionid=866C6FFC7148AF417483DD005778768C?art_id=93895&cat_id=35082

investment and has a very long payback period and high risks, so it is unattractive for investors. Thus, this alternative is the least plausible baseline scenario as there is a need to invest and it is characterized by lack of qualified personnel, therefore, *Alternative 2.1* can not be regarded as the plausible baseline scenario.

Outcome of step 2.

Analysis of the alternatives described above shows that *Alternative 1.1* is the most plausible, and *Alternative 1.2* is the least plausible.

Key information for baseline scenario setting is stated in the tables given below.

Data/Parameter	$EF^{y}_{p,tpp,i,c}$
Unit of measurement	t C/TJ
Description	Coefficient of carbon content in fuel "i" in monitoring period «y» project scenario
Periodicity of determination/monitoring	Once in monitoring period
Source of data (to be) used	"National inventory report of anthropogenic greenhouse gas emissions by sources and removals by sinks in Ukraine in 1990-2010"[11]
Value of data applied (for ex ante calculations/determinations)	N/A
Justification of the choice of data or description of measurement methods and procedures (to be) applied	N/A
QA/QC procedures (to be) applied	"National Inventory of anthropogenic GHG emissions by sources and removals by sinks in Ukraine" [12] is the official report submitted to the secretariat of the UN Framework Convention on Climate Change (UNFCCC)
Any comment	Minimum value is used according to the principles of conservatism

Data/Parameter	$OXID^{y}_{p,tpp,i}$
Unit of measurement	Relative units
Description	Carbon oxidation factor in the course of fuel "i" combustion in monitoring period «y» project scenario
Periodicity of determination/monitoring	Once in monitoring period
Source of data (to be) used	"National inventory report of anthropogenic greenhouse gas emissions by sources and removals by sinks in Ukraine in 1990-2010"[13]
Value of data applied (for ex ante calculations/determinations)	N/A

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

Justification of the choice of data or description of measurement methods and procedures (to be) applied	N/A
QA/QC procedures (to be) applied	"National Inventory of anthropogenic GHG emissions by sources and removals by sinks in Ukraine" [14] is the official report submitted to the secretariat of the UN Framework Convention on Climate Change (UNFCCC)
Any comment	Minimum value is used according to the principles of conservatism

Data/Parameter	$NCV^{y}_{p,tpp,i}$
Unit of measurement	GJ/(ths m^3 or t)
Description	Net calorific value of fuel "i" in monitoring period «y» project scenario
Periodicity of determination/monitoring	Once in monitoring period
Source of data (to be) used	Form №3-tech-TPP. The Ministry of Fuel and Energy of Ukraine "Technical and economic work indicators of equipment"
Value of data applied (for ex ante calculations/determinations)	N/A
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Data of measuring equipment is used for compilation of Form №3-tech-TPP. The Ministry of Fuel and Energy of Ukraine "Technical and economic work indicators of equipment"
QA/QC procedures (to be) applied	Measuring equipment is regularly calibrated in accordance with the procedures of quality management, the Law of Ukraine "On metrology and metrological activity."[15]
Any comment	N/A

Data/Parameter	$W^{y}_{p,tpp,i}$
Unit of measurement	%
Description	Percentage of fuel "i" from consumption of reference fuel in monitoring period «y» project scenario
Periodicity of determination/monitoring	Once in monitoring period
Source of data (to be) used	Form №3-tech-TPP. The Ministry of Fuel and Energy of Ukraine "Technical and economic work indicators of equipment"
Value of data applied (for ex ante calculations/determinations)	N/A

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

[15] http://www.ucrf.gov.ua/uk/doc/laws/1099563058/

Justification of the choice of data or description of measurement methods and procedures (to be) applied	Data of measuring equipment is used for compilation of Form №3-tech-TPP. The Ministry of Fuel and Energy of Ukraine "Technical and economic work indicators of equipment"
QA/QC procedures (to be) applied	Measuring equipment is regularly calibrated in accordance with the procedures of quality management, the Law of Ukraine "On metrology and metrological activity."[16]
Any comment	Measuring equipment is used to define the quantity of fossil fuel combusted than transfer it in reference fuel and determine the percentage of fuel «i» from consumed fuel

Data/Parameter	$EG^{y}_{p,tpp,i,rf}$
Unit of measurement	ths kW*h
Description	Total amount of supplied electricity in monitoring period *«y»* project scenario
Periodicity of determination/monitoring	Once in monitoring period
Source of data (to be) used	Form №3-tech-TPP. The Ministry of Fuel and Energy of Ukraine "Technical and economic work indicators of equipment"
Value of data applied (for ex ante calculations/determinations)	N/A
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Data of measuring equipment is used for compilation of Form №3-tech-TPP. The Ministry of Fuel and Energy of Ukraine "Technical and economic work indicators of equipment"
QA/QC procedures (to be) applied	Measuring equipment is regularly calibrated in accordance with the procedures of quality management, the Law of Ukraine "On metrology and metrological activity."[17]
Any comment	N/A

Data/Parameter	$FC^{j}_{b,tpp,i,rf}$
Unit of measurement	trf (tones of reference fuel)
Description	Total amount of reference fuel combustion in historical period *«j»* baseline scenario
Periodicity of determination/monitoring	Once in monitoring period
Source of data (to be) used	Form №3-tech-TPP. The Ministry of Fuel and Energy of Ukraine "Technical and economic work indicators of equipment"
Value of data applied (for ex ante calculations/determinations)	N/A

[16] http://www.ucrf.gov.ua/uk/doc/laws/1099563058/

[17] http://www.ucrf.gov.ua/uk/doc/laws/1099563058/

Justification of the choice of data or description of measurement methods and procedures (to be) applied	Data of measuring equipment is used for compilation of Form №3-tech-TPP. The Ministry of Fuel and Energy of Ukraine "Technical and economic work indicators of equipment"
QA/QC procedures (to be) applied	Measuring equipment is regularly calibrated in accordance with the procedures of quality management, the Law of Ukraine "On metrology and metrological activity."[18]
Any comment	Measuring equipment is used to define the quantity of fossil fuel combusted than transfer it in reference fuel

Data/Parameter	$EG^{j}_{b,tpp,i,rf}$
Unit of measurement	ths kW*h
Description	Total amount of supplied electricity in historical period «*j*», baseline scenario
Periodicity of determination/monitoring	Once in monitoring period
Source of data (to be) used	Form №3-tech-TPP. The Ministry of Fuel and Energy of Ukraine "Technical and economic work indicators of equipment"
Value of data applied (for ex ante calculations/determinations)	N/A
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Data of measuring equipment is used for compilation of Form №3-tech-TPP. The Ministry of Fuel and Energy of Ukraine "Technical and economic work indicators of equipment"
QA/QC procedures (to be) applied	Measuring equipment is regularly calibrated in accordance with the procedures of quality management, the Law of Ukraine "On metrology and metrological activity."[19]
Any comment	N/A

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:

Additionality of the project

The additionality of the project activity is demonstrated and assessed by using the "Tool for the demonstration and assessment of additionality" (Version 06.0.0[20]). This manual was elaborated in original for CDM projects, but it may be also applied to JI projects.

Step 1. Identification of alternatives to the project activity and their consistency with current laws and regulations

Sub-step 1a. Definition of alternatives to the project activity

[18] http://www.ucrf.gov.ua/uk/doc/laws/1099563058/

[19] http://www.ucrf.gov.ua/uk/doc/laws/1099563058/

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

There are three alternatives to this project. (that were described in Section B1)

Alternative 1.1: Continuation of the current situation, without the JI project implementation.

Alternative 1.2: The proposed project activity without the use of the Joint Implementation mechanism.

Outcome of sub-step 1a. Two realistic alternative scenarios to the project activity are identified

Sub-step 1b. Consistency with mandatory laws and regulations

Alternative 1.1 and *Alternative 1.2* are consistent with:
Law of Ukraine "On Electricity"[21] as of 16/10/1997 № 575/97-VR;
Law of Ukraine "On Energy Saving"[22];
Decree of the Cabinet of Ministers of Ukraine as of November 19, 2008 № 1446-r "On Approval of the Concept of the State Target Economic Program of energy efficiency for 2010-2015 "[23].
Outcome of sub-step 1b. Under such circumstances one may conclude that all scenarios are consistent with current laws and regulatory acts. Therefore Step 1. is satisfied.
According to the " Tool for the demonstration and assessment of additionality " (Version 06.0.0) further justification of additionality shall be performed by means of barrier analysis, so Step 2. Investment Analysis is not applicable.

Step 3: Barrier Analysis
Sub-step 3a: Identify barriers that would prevent the implementation of the proposed project activity

1. Organizational barriers

There is no management experience in implementation of JIP, including: leading international negotiations, determination, verification, registration, monitoring, etc..

2. Barriers due to prevailing practice

According to the rules established by the National Commission, which provides state regulation in the energy sector and SE " Energorynok" the company in the case of the introduction of measures to improve the technological equipment the company provides investment component in the electricity tariff. So the company updates its technology base and all losses rely on the end users, so PJSC "Centrenergo" have no incentive to implement JI project, it is more appropriate to continue the common practice of "business as usual".

Outcome of Sub-step 3a: Realistic barriers that may prevent the implementation of project activities were identified.

Sub-step 3b: Shows that the identified barriers would not prevent the implementation of at least one of the alternatives (except the proposed project activity)

[21] http://zakon2.rada.gov.ua/laws/show/575/97-%D0%B2%D1%80/page

[22] http://zakon2.rada.gov.ua/laws/show/74/94-%D0%B2%D1%80

[23] http://zakon3.rada.gov.ua/laws/show/1446-2008-%D1%80

Alternative 1.1: Continuation of the current situation, without the JI project implementation.

One of the alternatives (Alternative 1.1) is a continuation of the current practice, without JI project. Barriers identified above, in no way can interfere with this alternative, but rather stimulate the company to continue the common practice of "business as usual."

Outcome of Sub-step 3b: Thus, the identified barriers would prevent the implementation of the proposed project, but does not prevent at least one of the other alternatives - continuation of existing practices without JI project. Therefore Step 3 is satisfied.

Step 3: Common practice analysis

Sub-step 4a. Analysis of other activities similar to the proposed project activity

Analysis of other activities similar to the proposed project activity has shown that similar JIP was implemented within the territory of Ukraine:

- "Rehabilitation and technical re-equipment of Starobeshivska thermal power plant of the OJSC "Donbasenergo"[24]

but according to the "Tool for the demonstration and assessment of additionality" (Version 06.0) there is no need to conduct analysis of similar project activity as these projects are implemented under JI project according to the Kyoto Protocol to the UN Framework Convention on Climate Change.

Outcome of Step 4: There is no need to conduct analysis of similar project activity.

According to the "Tool for the demonstration and assessment of additionality" (Version 06.0) all steps are satisfied.

Conclusion

Based on the above analysis we can conclude that the project is additional.

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

The project boundary includes technological equipment used in the production of electricity, a list of the equipment listed in "The register of basic technological equipment of PJSC "Centrenergo" TPP for 01/07/2012 included in JI Project boundary".*Table 5. An overview of all sources of emissions in the baseline scenario*

Source	Gas	Included / Excluded	Substantiation / explanation
Baseline emissions			
Fossil fuel	CO_2	Included	GHG emissions in the course of electricity generation

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

[24] http://www.neia.gov.ua/nature/doccatalog/document?id=122629

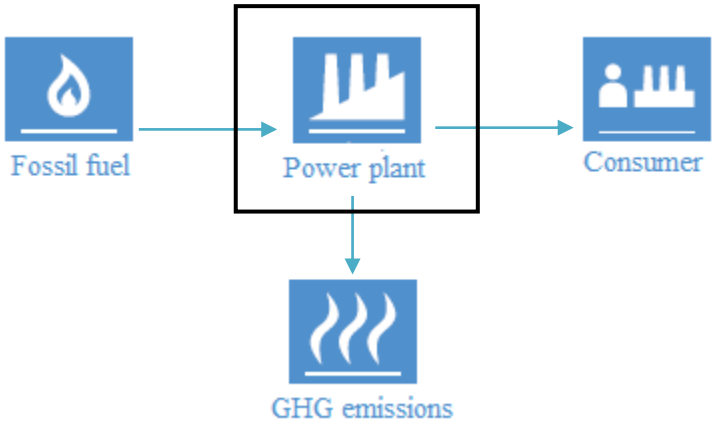


Figure 4. Boundary and GHG emissions sources in the baseline scenario

Greenhouse gas sources and boundary of the project scenario.

Table 6. An overview of all sources of emissions in the project scenario

Source	Gas	Included / Excluded	Substantiation / explanation
Project emissions			
Fossil fuel	CO_2	Included	GHG emissions in the course of electricity generation

Indirect irrelevand leaks of CO_2, CH_4, N_2O were excluded. The leaks are not under the control of the project developer (it is impossible to estimate the volume of leaks), that is why they were excluded.
Project boundary for the project scenario is presented in a black rectangle below.

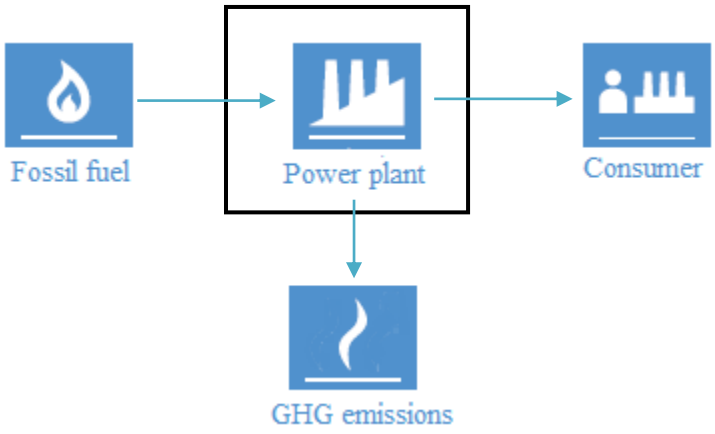


Figure 5. Boundary and GHG emissions sources in the project scenario

Note: TPP refers to Vuglegirska TPP, Zmyivska TPP, Trypilska TPP

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

Baseline formation date: 14/09/2012
The baseline has been set by CEP Carbon Emissions Partners S.A. and PJSC "Centrenergo".

PJSC "Centrenergo"
Chmyrenko Olexandr Mikolayovich
Director General
Telephone: +(380 44) 364-02-20
Fax: +(380 44) 364-02-66
e-mail: kanc@centrenergo.com
PJSC "Centrenergo" is the project participant (stated in Annex 1).

CEP Carbon Emissions Partners S.A.:
Route de Thonon 45, Geneva, Switzerland.
Fabian Knodel,
Director.
Telephone: +41 (76) 3461157
Fax: +41 (76) 3461157
E-mail: 0709bp@gmail.com
CEP Carbon Emissions Partners S.A. is the project participant (stated in Annex 1).

SECTION C. Duration of the project / crediting period

C.1. Starting date of the project:

13/03/2000 - when PJSC "Centrenergo" started implementation of the project activities aimed at improving of the technological equipment and improving indexes of its efficiency, reliability and security.

C.2. Expected operational lifetime of the project:

Ukraine ratified the Kyoto Protocol to the UN Framework Convention on Climate Change in 2004[25], based on this the starting date of the operational lifetime of the project 01/01/2004.

Operational lifetime of the project from 01/01/2004 to 31/12/2017 (14 years and 0 months or 168 months) taking into account the maintained equipment.

C.3. Length of the crediting period:

01/01/2008- 31/12/2012 (5 years or 60 months), continuation 01/01/2013- 31/12/2017 (5 years or 60 months).

The project provides that the first assigned amount units are expected to be generated from 01/01/2004 p. to 31/12/2007. Generation of ERUs relates to the first commitment period of 5 years (January 1, 2008 - December 31, 2012). Prolongation of the crediting period after 2012 is subject to approval by the host Party and calculations of emission reductions are presented separately for the period before 2012 and for the period after 2012.

[25] http://zakon.rada.gov.ua/cgi-bin/laws/main.cgi?nreg=1430-15

SECTION D. Monitoring plan

D.1. Description of monitoring plan chosen:

The proposed project uses the specific approach to JI projects based on requirements to JI projects according to paragraph 9 (a) of "Guidance on criteria for baseline setting and monitoring" (Version 03).

All relevant data related to the calculation of GHG emission reductions are stored in an electronic database. Each monitoring report will include all necessary information from this database.
The primary monitoring data necessary for calculating GHG emission reductions will be stored in separate sections of the company during the crediting period and at least two years since the last transfer of ERUs in the project.

The table of parameters that will be included in the process of monitoring and verification for ERUs calculation, presented in Sections **D.1.1.1** and **D.1.1.3.**
Detailed monitoring plan is presented in Annex 3.
Data and parameters not monitored throughout the whole crediting period, but determined only once, which are available at the stage of PDD development:

$NCV^{y}_{p,tpp,i,rf}$	Net caloric value of reference fuel in monitoring period *«y»* project scenario, is 29,3 GJ/trf
$FC^{j}_{b,tpp,i,rf}$	Total amount of reference fuel combustion in historical period *«j»* baseline scenario, trf
$EG^{j}_{b,tpp,i,rf}$	Total amount of supplied electricity in historical period *«j»*, baseline scenario, ths kW*h

Data and parameters that are not monitored during the crediting period but are identified only once and are not available at the PDD development stage: none

Data and parameters that are monitored during the whole crediting period:

$EF^{y}_{p,tpp,i,c}$	Coefficient of the carbon content in fuel "i" in monitoring period *«y»* baseline scenario, t C/TJ
$OXID^{y}_{p,tpp,i}$	Carbon oxidation factor in the course of fuel "i" combustion in monitoring period *«y»* project scenario, relative units
$NCV^{y}_{p,tpp,i}$	Net calorific value of fuel "i" in monitoring period *«y»* project scenario, GJ/(ths m^3 or t)
$W^{y}_{p,tpp,i}$	Percentage of fuel "i" from consumption of reference fuel in monitoring period *«y»* project scenario, %

$EG^{y}_{p,tpp,i,rf}$	Total amount of supplied electricity in monitoring period «y» project scenario, ths kW*h
$FC^{y}_{p,tpp,i,rf}$	Total amount of reference fuel in monitoring period «y» baseline scenario, trf

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

The monitoring plan is described in details in Appendix 3.

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

Data/Parameter	$EF^{y}_{p,tpp,i,c}$
Unit of measurement	t C/TJ
Description	Coefficient of carbon content in fuel "i" in monitoring period «y» project scenario
Periodicity of determination/monitoring	Once in monitoring period
Source of data (to be) used	"National inventory report of anthropogenic greenhouse gas emissions by sources and removals by sinks in Ukraine in 1990-2010"[26]
Value of data applied (for ex ante calculations/determinations)	N/A
Justification of the choice of data or description of measurement methods and procedures (to be) applied	N/A
QA/QC procedures (to be) applied	"National Inventory of anthropogenic GHG emissions by sources and removals by sinks in Ukraine" [27] is the official report submitted to the secretariat of the UN Framework Convention on Climate Change (UNFCCC)
Any comment	Minimum value is used according to the principles of conservatism

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

Data/Parameter	$OXID^{y}_{p,tpp,i}$
Unit of measurement	Relative units
Description	Carbon oxidation factor in the course of fuel "i" combustion in monitoring period *«y»* project scenario
Periodicity of determination/monitoring	Once in monitoring period
Source of data (to be) used	"National inventory report of anthropogenic greenhouse gas emissions by sources and removals by sinks in Ukraine in 1990-2010"[28]
Value of data applied (for ex ante calculations/determinations)	N/A
Justification of the choice of data or description of measurement methods and procedures (to be) applied	N/A
QA/QC procedures (to be) applied	"National Inventory of anthropogenic GHG emissions by sources and removals by sinks in Ukraine" [29] is the official report submitted to the secretariat of the UN Framework Convention on Climate Change (UNFCCC)
Any comment	Minimum value is used according to the principles of conservatism

Data/Parameter	$NCV^{y}_{p,tpp,i}$
Unit of measurement	GJ/(ths m^3 or t)
Description	Net calorific value of fuel "i" in monitoring period *«y»* project scenario
Periodicity of determination/monitoring	Once in monitoring period

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

Source of data (to be) used	Form №3-tech-TPP. The Ministry of Fuel and Energy of Ukraine "Technical and economic work indicators of equipment"
Value of data applied (for ex ante calculations/determinations)	N/A
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Data of measuring equipment is used for compilation of Form №3-tech-TPP. The Ministry of Fuel and Energy of Ukraine "Technical and economic work indicators of equipment"
QA/QC procedures (to be) applied	Measuring equipment is regularly calibrated in accordance with the procedures of quality management, the Law of Ukraine "On metrology and metrological activity."[30]
Any comment	N/A

Data/Parameter	$W^{y}_{p,tpp,i}$
Unit of measurement	%
Description	Percentage of fuel "i" from consumption of reference fuel in monitoring period *«y»* project scenario
Periodicity of determination/monitoring	Once in monitoring period
Source of data (to be) used	Form №3-tech-TPP. The Ministry of Fuel and Energy of Ukraine "Technical and economic work indicators of equipment"
Value of data applied (for ex ante calculations/determinations)	N/A
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Data of measuring equipment is used for compilation of Form №3-tech-TPP. The Ministry of Fuel and Energy of Ukraine "Technical and economic work indicators of equipment"
QA/QC procedures (to be) applied	Measuring equipment is regularly calibrated in accordance with the procedures of quality management, the Law of Ukraine "On metrology

[30] http://www.ucrf.gov.ua/uk/doc/laws/1099563058/

	and metrological activity."[31]
Any comment	Measuring equipment is used to define the quantity of fossil fuel combusted than transfer it in reference fuel and determine the percentage of fuel «i» from consumed fuel

Data/Parameter	$EG^{y}_{p,tpp,i,rf}$
Unit of measurement	ths kW*h
Description	Total amount of supplied electricity in monitoring period *«y»* project scenario
Periodicity of determination/monitoring	Once in monitoring period
Source of data (to be) used	Form №3-tech-TPP. The Ministry of Fuel and Energy of Ukraine "Technical and economic work indicators of equipment"
Value of data applied (for ex ante calculations/determinations)	N/A
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Data of measuring equipment is used for compilation of Form №3-tech-TPP. The Ministry of Fuel and Energy of Ukraine "Technical and economic work indicators of equipment"
QA/QC procedures (to be) applied	Measuring equipment is regularly calibrated in accordance with the procedures of quality management, the Law of Ukraine "On metrology and metrological activity."[32]
Any comment	N/A

Data/Parameter	$FC^{j}_{b,tpp,i,rf}$
Unit of measurement	trf (tones of reference fuel)

[31] http://www.ucrf.gov.ua/uk/doc/laws/1099563058/

[32] http://www.ucrf.gov.ua/uk/doc/laws/1099563058/

Description	Total amount of reference fuel combustion in historical period *«j»* baseline scenario
Periodicity of determination/monitoring	Once in monitoring period
Source of data (to be) used	Form №3-tech-TPP. The Ministry of Fuel and Energy of Ukraine "Technical and economic work indicators of equipment"
Value of data applied (for ex ante calculations/determinations)	N/A
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Data of measuring equipment is used for compilation of Form №3-tech-TPP. The Ministry of Fuel and Energy of Ukraine "Technical and economic work indicators of equipment"
QA/QC procedures (to be) applied	Measuring equipment is regularly calibrated in accordance with the procedures of quality management, the Law of Ukraine "On metrology and metrological activity."[33]
Any comment	Measuring equipment is used to define the quantity of fossil fuel combusted than transfer it in reference fuel

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

$$PE_p^y = \sum_{n=1}^{3} PE_{p,tpp}^y \quad ; \qquad (1)$$

PE_p^y - total estimated GHG emission reduction in monitoring period *«y»* project scenario, t CO_2eq;

$PE_{p,tpp}^y$ - total estimated TPP GHG emission reduction in monitoring period *«y»* project scenario, t CO_2eq;

$$PE_{p,tpp}^y = \sum_{n=1}^{3} PE_{p,tpp,i}^y \; ; \qquad (2)$$

$PE_{p,tpp,i}^y$ - total estimated TPP GHG emission reduction from fuel "i" in monitoring period *«y»* project scenario, t CO_2eq;

[33] http://www.ucrf.gov.ua/uk/doc/laws/1099563058/

$$PE^{y}_{p,tpp,i} = FC^{y}_{p,tpp,i} \cdot EF^{y}_{p,tpp,i}; \quad (3)$$

$FC^{y}_{p,tpp,i}$ - total amount of fuel "i" combustion in monitoring period *«y»* project scenario, ths m^3 or t;

$EF^{y}_{p,tpp,i}$ - default CO_2 emission factor for stationary combustion of fuel "i" in monitoring period *y*, in the project scenario, t CO_2/TJ;

$$EF^{y}_{p,tpp,i} = EF^{y}_{p,tpp,i,c} \cdot OXID^{y}_{p,tpp,i} \cdot NCV^{y}_{p,tpp,i} \cdot \frac{44}{12} \cdot 10^{-3}; \quad (4)$$

$EF^{y}_{p,tpp,i,c}$ - coefficient of the carbon content in fuel "i" in monitoring period *«y»* project scenario, t C/TJ;

$OXID^{y}_{p,tpp,i}$ - carbon oxidation factor in the course of fuel "i" combustion in monitoring period *«y»* project scenario, relative units;

$NCV^{y}_{p,tpp,i}$ - net calorific value of fuel "i" in monitoring period *«y»* project scenario, GJ/(ths m^3 or t);

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

10^{-3} - transfer coefficient from GJ to TJ;

$$FC^{y}_{p,tpp,i} = \frac{FC^{y}_{p,tpp,i,rf} \cdot W^{y}_{p,tpp,i} \cdot NCV^{y}_{p,tpp,i,rf}}{NCV^{y}_{p,tpp,i}}; \quad (5)$$

$FC^{y}_{p,tpp,i,rf}$ - total amount of reference fuel in monitoring period *«y»* project scenario, trf;

$W^{y}_{p,tpp,i}$ - percentage of fuel "i" from consumption of reference fuel in monitoring period *«y»* project scenario, %;

$NCV^{y}_{p,tpp,i,rf}$ - net caloric value of reference fuel in monitoring period *«y»* project scenario, is 29,3 GJ/trf;

$NCV^{y}_{p,tpp,i}$ - net calorific value of fuel "i" in monitoring period *«y»* project scenario, GJ/(ths m^3 or t);

[p] - index corresponding to project scenario;
[y] - index corresponding to monitoring period;
[tpp] - index related to TPP;
[i] - index corresponding to fuel combustion;
[rf] – index related to reference fuel.

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:

Data/Parameter	$EF^{y}_{p,tpp,i,c}$
Unit of measurement	t C/TJ
Description	Coefficient of carbon content in fuel "i" in monitoring period «y» project scenario
Periodicity of determination/monitoring	Once in monitoring period
Source of data (to be) used	"National inventory report of anthropogenic greenhouse gas emissions by sources and removals by sinks in Ukraine in 1990-2010"[34]
Value of data applied (for ex ante calculations/determinations)	N/A
Justification of the choice of data or description of measurement methods and procedures (to be) applied	N/A
QA/QC procedures (to be) applied	"National Inventory of anthropogenic GHG emissions by sources and removals by sinks in Ukraine" [35] is the official report submitted to the secretariat of the UN Framework Convention on Climate Change (UNFCCC)
Any comment	Minimum value is used according to the principles of conservatism

Data/Parameter	$OXID^{y}_{p,tpp,i}$
Unit of measurement	Relative units
Description	Carbon oxidation factor in the course of fuel "i" combustion in

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

	monitoring period «y» project scenario
Periodicity of determination/monitoring	Once in monitoring period
Source of data (to be) used	"National inventory report of anthropogenic greenhouse gas emissions by sources and removals by sinks in Ukraine in 1990-2010"[36]
Value of data applied (for ex ante calculations/determinations)	N/A
Justification of the choice of data or description of measurement methods and procedures (to be) applied	N/A
QA/QC procedures (to be) applied	"National Inventory of anthropogenic GHG emissions by sources and removals by sinks in Ukraine" [37] is the official report submitted to the secretariat of the UN Framework Convention on Climate Change (UNFCCC)
Any comment	Minimum value is used according to the principles of conservatism

Data/Parameter	$NCV^{y}_{p,tpp,i}$
Unit of measurement	GJ/(ths m^3 or t)
Description	Net calorific value of fuel "i" in monitoring period «y» project scenario
Periodicity of determination/monitoring	Once in monitoring period
Source of data (to be) used	Form №3-tech-TPP. The Ministry of Fuel and Energy of Ukraine "Technical and economic work indicators of equipment"
Value of data applied (for ex ante calculations/determinations)	N/A

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

Justification of the choice of data or description of measurement methods and procedures (to be) applied	Data of measuring equipment is used for compilation of Form №3-tech-TPP. The Ministry of Fuel and Energy of Ukraine "Technical and economic work indicators of equipment"
QA/QC procedures (to be) applied	Measuring equipment is regularly calibrated in accordance with the procedures of quality management, the Law of Ukraine "On metrology and metrological activity."[38]
Any comment	N/A

Data/Parameter	$W^{y}_{p,tpp,i}$
Unit of measurement	%
Description	Percentage of fuel "i" from consumption of reference fuel in monitoring period *«y»* project scenario
Periodicity of determination/monitoring	Once in monitoring period
Source of data (to be) used	Form №3-tech-TPP. The Ministry of Fuel and Energy of Ukraine "Technical and economic work indicators of equipment"
Value of data applied (for ex ante calculations/determinations)	N/A
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Data of measuring equipment is used for compilation of Form №3-tech-TPP. The Ministry of Fuel and Energy of Ukraine "Technical and economic work indicators of equipment"
QA/QC procedures (to be) applied	Measuring equipment is regularly calibrated in accordance with the procedures of quality management, the Law of Ukraine "On metrology and metrological activity."[39]

[38] http://www.ucrf.gov.ua/uk/doc/laws/1099563058/

[39] http://www.ucrf.gov.ua/uk/doc/laws/1099563058/

Any comment	Measuring equipment is used to define the quantity of fossil fuel combusted than transfer it in reference fuel and determine the percentage of fuel «i» from consumed fuel

Data/Parameter	$EG^{y}_{p,tpp,i,rf}$
Unit of measurement	ths kW*h
Description	Total amount of supplied electricity in monitoring period *«y»* project scenario
Periodicity of determination/monitoring	Once in monitoring period
Source of data (to be) used	Form №3-tech-TPP. The Ministry of Fuel and Energy of Ukraine "Technical and economic work indicators of equipment"
Value of data applied (for ex ante calculations/determinations)	N/A
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Data of measuring equipment is used for compilation of Form №3-tech-TPP. The Ministry of Fuel and Energy of Ukraine "Technical and economic work indicators of equipment"
QA/QC procedures (to be) applied	Measuring equipment is regularly calibrated in accordance with the procedures of quality management, the Law of Ukraine "On metrology and metrological activity."[40]
Any comment	N/A

Data/Parameter	$FC^{j}_{b,tpp,i,rf}$
Unit of measurement	trf (tones of reference fuel)
Description	Total amount of reference fuel combustion in historical period *«j»* baseline scenario

[40] http://www.ucrf.gov.ua/uk/doc/laws/1099563058/

Periodicity of determination/monitoring	Once in monitoring period
Source of data (to be) used	Form №3-tech-TPP. The Ministry of Fuel and Energy of Ukraine "Technical and economic work indicators of equipment"
Value of data applied (for ex ante calculations/determinations)	N/A
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Data of measuring equipment is used for compilation of Form №3-tech-TPP. The Ministry of Fuel and Energy of Ukraine "Technical and economic work indicators of equipment"
QA/QC procedures (to be) applied	Measuring equipment is regularly calibrated in accordance with the procedures of quality management, the Law of Ukraine "On metrology and metrological activity."[41]
Any comment	Measuring equipment is used to define the quantity of fossil fuel combusted than transfer it in reference fuel

Data/Parameter	$EG^{j}_{b,tpp,i,rf}$
Unit of measurement	ths kW*h
Description	Total amount of supplied electricity in historical period *«j»*, baseline scenario
Periodicity of determination/monitoring	Once in monitoring period
Source of data (to be) used	Form №3-tech-TPP. The Ministry of Fuel and Energy of Ukraine "Technical and economic work indicators of equipment"
Value of data applied (for ex ante calculations/determinations)	N/A
Justification of the choice of data or description of measurement methods and	Data of measuring equipment is used for compilation of Form №3-tech-TPP. The Ministry of Fuel and Energy of Ukraine "Technical and economic work indicators of equipment"

[41] http://www.ucrf.gov.ua/uk/doc/laws/1099563058/

procedures (to be) applied	
QA/QC procedures (to be) applied	Measuring equipment is regularly calibrated in accordance with the procedures of quality management, the Law of Ukraine "On metrology and metrological activity."[42]
Any comment	N/A

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

$$BE_b^y = \sum_{n=1}^{3} BE_{b,tpp}^y \quad ; \tag{6}$$

BE_b^y - total estimated GHG emission reduction in monitoring period *«y»* baseline scenario, t CO_2eq;

$BE_{b,tpp}^y$ - total estimated TPP GHG emission reduction in monitoring period *«y»* baseline scenario, t CO_2eq;

$$BE_{b,tpp}^y = \sum_{n=1}^{3} BE_{b,tpp,i}^y \; ; \tag{7}$$

$BE_{b,tpp,i}^y$ - total estimated TPP GHG emission reduction from fuel "i" in monitoring period *«y»* baseline scenario, t CO_2eq;

$$BE_{b,tpp,i}^y = FC_{b,tpp,i}^y \cdot EF_{p,tpp,i}^y \quad ; \tag{8}$$

$FC_{b,tpp,i}^y$ - total amount of fuel "i" combustion in monitoring period *«y»* baseline scenario, ths m^3 or t;

$EF_{p,tpp,i}^y$ - default CO_2 emission factor for stationary combustion of fuel "i" in monitoring period *y*, in the project scenario, t CO_2/TJ;

$$EF_{p,tpp,i}^y = EF_{p,tpp,i,c}^y \cdot OXID_{p,tpp,i}^y \cdot NCV_{p,tpp,i}^y \cdot \frac{44}{12} \cdot 10^{-3} \quad ; \tag{9}$$

$EF_{p,tpp,i,c}^y$ - coefficient of the carbon content in fuel "i" in monitoring period *«y»* baseline scenario, t C/TJ;

$OXID_{p,tpp,i}^y$ - carbon oxidation factor in the course of fuel "i" combustion in monitoring period *«y»* project scenario, relative units;

[42] http://www.ucrf.gov.ua/uk/doc/laws/1099563058/

$NCV^{y}_{p,tpp,i}$ - net calorific value of fuel "i" in monitoring period *«y»* project scenario, GJ/(ths m^3 or t);

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

10^{-3} - transfer coefficient from GJ to TJ;

$$FC^{y}_{b,tpp,i} = \frac{FC^{y}_{b,tpp,i,rf} \cdot W^{y}_{p,tpp,i} \cdot NCV^{y}_{p,tpp,i,rf}}{NCV^{y}_{p,tpp,i}} \quad ;$$

(10)

$FC^{y}_{b,tpp,i,rf}$ - total amount of reference fuel in monitoring period *«y»* baseline scenario, trf;

$W^{y}_{p,tpp,i}$ - percentage of fuel "i" from consumption of reference fuel in monitoring period *«y»* project scenario, %;

$NCV^{y}_{p,tpp,i,rf}$ - net caloric value of reference fuel in monitoring period *«y»* project scenario, is 29,3 GJ/trf;

$NCV^{y}_{p,tpp,i}$ - net calorific value of fuel "i" in monitoring period *«y»* project scenario, GJ/(ths m^3 or t);

$$FC^{y}_{b,tpp,i,rf} = BPER^{y}_{b,tpp,i,rf} \cdot EG^{y}_{p,tpp,i,rf} \quad ; \qquad (11)$$

$BPER^{y}_{b,tpp,i,rf}$ - specific reference fuel consumption in monitoring period *«y»* baseline scenario, trf/ ths.kW*h;

$EG^{y}_{p,tpp,i,rf}$ - total amount of supplied electricity in monitoring period *«y»* project scenario, ths.kW*h;

Calculation of specific reference fuel consumption in monitoring period *«y»* baseline scenario is based on the assumption of its linear growth with time. This linear dependence is based on historical data (historical period) from 1993 to 1999 using the method of least squares.

$$BPER^{y}_{b,tpp,i,rf} = a \cdot y - b \qquad (12)$$

$$a = \frac{j\sum_{j} BPER^{j}_{b,tpp,i,rf} - \sum_{j} BPER^{j}_{b,tpp,i,rf} \cdot \sum_{j} j}{j\sum_{j} j^2 - (\sum_{j} j)^2} \qquad (13)$$

$$b = \frac{\sum_j BPER^j_{b,tpp,i,rf} - a \cdot \sum_j j}{j} \quad (14)$$

$$BPER^j_{b,tpp,i,rf} = \frac{FC^j_{b,tpp,i,rf}}{EG^j_{b,tpp,i,rf}} \quad (15)$$

$FC^j_{b,tpp,i,rf}$ - total amount of reference fuel combustion in historical period *«j»* baseline scenario, trf;

$EG^j_{b,tpp,i,rf}$ - total amount of supplied electricity in historical period *«j»*, baseline scenario, ths.kW*h;

a - coefficient of linear dependence;
b - coefficient of linear dependence;
[b] - index corresponding to baseline scenario;
[p] - index corresponding to project scenario;
[y] - index corresponding to monitoring period;
[j] - index corresponding to historical period;
[tpp] - index related to TPP;
[i] - index corresponding to fuel combustion;
[rf] - index related to reference fuel.

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

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

N/A

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

N/A

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

Increase in GHG emissions outside the project boundary which might be caused by the project are not expected..

D.1.3.1. If applicable, please describe the data and information that will be collected in order to monitor leakage effects of the project:

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

N/A

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

N/A

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):

Calculation of emission reductions achieved as a result of the project activity (calculated in accordance with a specific approach to JI projects):

$$ER^y = BE_b^y - PE_p^y \quad (16)$$

ER^y - emission reductions achieved as a result of the project activity, in period «*y*», (t CO_2e);
PE_p^y - total estimated GHG emissions, in monitoring period «*y*», project scenario (t CO_2e);
BE_b^y - total estimated GHG emissions, in monitoring period «*y*», baseline scenario (t CO_2e);
$[y]$ - index corresponding to monitoring period;
$[b]$ - index corresponding to baseline scenario;
$[p]$ - index corresponding to project scenario.

The Supporting document 1 (Excel file) contains the calculation of baseline and project emissions as well as emission reductions of the project during the monitoring period.

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

The main legislative acts of Ukraine relating to the monitoring of the environmental impact of business entities are:

- Law of Ukraine № 1264-XII "On environmental protection"[43] dated 25/06/1991
- Law of Ukraine № 2707-XII "On atmospheric air protection"[44] dated 16/10/1992.
- Current rules on emission limitation: «Norms of maximum permissible emissions of pollutants from permanent sources» – approved by the Ministry of Environmental Protection of Ukraine dated 27/06/2006, №309 and registered in the Ministry of Justice of Ukraine dated 01/09/2006, №912/12786.

The main areas of environmental protection activities of PJSC "Centrenergo" are:

• Protection of air basin.

• Land protection and waste management.

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.
$FC^{j}_{b,tpp,i,rf}$	Low	Data of measuring equipment is used for compilation of Form №3-tech-TPP. The Ministry of Fuel and Energy of Ukraine "Technical and economic work indicators of equipment". Measuring equipment is regularly calibrated in accordance with the procedures of quality management, the Law of Ukraine "On metrology and metrological activity."[45]

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

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

[45] http://www.ucrf.gov.ua/uk/doc/laws/1099563058/

$EG^{j}_{b,tpp,i,rf}$	Low	Data of measuring equipment is used for compilation of Form №3-tech-TPP. The Ministry of Fuel and Energy of Ukraine "Technical and economic work indicators of equipment". Measuring equipment is regularly calibrated in accordance with the procedures of quality management, the Law of Ukraine "On metrology and metrological activity."[46]
$EF^{y}_{p,tpp,i,c}$	Low	"National Inventory of anthropogenic GHG emissions by sources and removals by sinks in Ukraine" [47] is the official report submitted to the secretariat of the UN Framework Convention on Climate Change (UNFCCC)
$OXID^{y}_{p,tpp,i}$	Low	"National Inventory of anthropogenic GHG emissions by sources and removals by sinks in Ukraine" [48] is the official report submitted to the secretariat of the UN Framework Convention on Climate Change (UNFCCC)
$NCV^{y}_{p,tpp,i}$	Low	Data of measuring equipment is used for compilation of Form №3-tech-TPP. The Ministry of Fuel and Energy of Ukraine "Technical and economic work indicators of equipment". Measuring equipment is regularly calibrated in accordance with the procedures of quality management, the Law of Ukraine "On metrology and metrological activity."[49]
$W^{y}_{p,tpp,i}$	Low	Data of measuring equipment is used for compilation of Form №3-tech-TPP. The Ministry of Fuel and Energy of Ukraine "Technical and economic work indicators of equipment". Measuring equipment is regularly calibrated in accordance with the procedures of quality management, the Law of Ukraine "On metrology and metrological activity."[50] Measuring equipment is used to define the quantity of fossil fuel combusted than transfer it in reference fuel and determine the percentage of fuel «i» from consumed fuel
$EG^{y}_{p,tpp,i,rf}$	Low	Data of measuring equipment is used for compilation of Form №3-tech-TPP. The Ministry of Fuel and Energy of Ukraine "Technical and economic work indicators of equipment". Measuring equipment is regularly calibrated in accordance with the procedures of quality management, the Law of Ukraine "On metrology and metrological activity."[51]

[46] http://www.ucrf.gov.ua/uk/doc/laws/1099563058/
[47] http://unfccc.int/files/national_reports/annex_i_ghg_inventories/national_inventories_submissions/application/zip/ukr-2012-nir-13apr.zip
[48] http://unfccc.int/files/national_reports/annex_i_ghg_inventories/national_inventories_submissions/application/zip/ukr-2012-nir-13apr.zip
[49] http://www.ucrf.gov.ua/uk/doc/laws/1099563058/
[50] http://www.ucrf.gov.ua/uk/doc/laws/1099563058/
[51] http://www.ucrf.gov.ua/uk/doc/laws/1099563058/

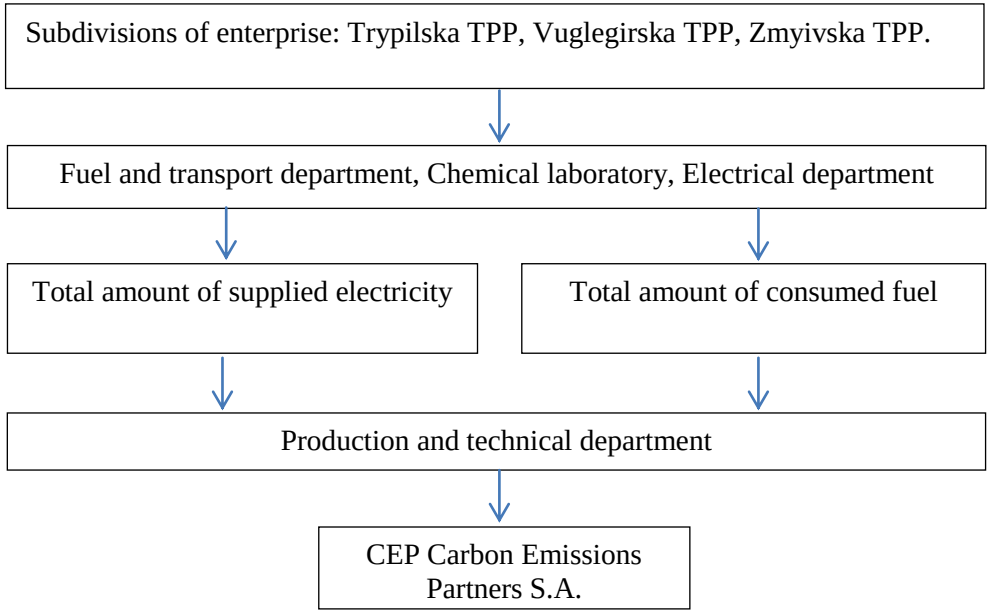
$FC^{y}_{p,tpp,i,rf}$	Low	Data of measuring equipment is used for compilation of Form №3-tech-TPP. The Ministry of Fuel and Energy of Ukraine "Technical and economic work indicators of equipment". Measuring equipment is regularly calibrated in accordance with the procedures of quality management, the Law of Ukraine "On metrology and metrological activity."[52] Measuring equipment is used to define the quantity of fossil fuel combusted than transfer it in reference fuel

To ensure conservativeness of the parameters of medium and high level of uncertainty will be carry out permanent regular calibration of metering equipment and use the latest editions of the normative and technical documentation. In the absence of recent editions of the normative and technical documentation their predecessors will be used.

[52] http://www.ucrf.gov.ua/uk/doc/laws/1099563058/

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

The operational and management structure that is used in implementation of the project is shown below.



The main source of data necessary for the operator to monitor and calculation GHG emission reductions to the project activity is a form Form №3-tech-TPP. The Ministry of Fuel and Energy of Ukraine "Technical and economic work indicators of equipment"
Therefore operational and management structure, which is used to implement the project will be integrated into the data collection according to the practice, established at the enterprise that allows to gather source data consolidate and cross-check, without involving any additional measures and changes in practice, established at the enterprise.

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

The monitoring plan and the baseline are set by CEP Carbon Emissions Partners S.A. and PJSC "Centrenergo".

PJSC "Centrenergo"
Chmyrenko Olexandr Mikolayovich
Director General
Telephone: +(380 44) 364-02-20
Fax: +(380 44) 364-02-66
e-mail: kanc@centrenergo.com
PJSC "Centrenergo" is the project participant (stated in Annex 1).

CEP Carbon Emissions Partners S.A.:
Route de Thonon 45, Geneva, Switzerland.
Fabian Knodel,
Director.
Telephone: +41 (76) 3461157
Fax: +41 (76) 3461157
E-mail: 0709bp@gmail.com
CEP Carbon Emissions Partners S.A. is the project participant (stated in Annex 1).

SECTION E. Estimation of greenhouse gas emission reductions

E.1. Estimated project emissions:

Project emissions were estimated in accordance with the formulae given in Section D.1.1.2. To estimate emissions for the monitoring period existing data were used.

Results of calculation are provided in the tables below. The calculations are stated in Excel file Supporting document 1 annexed to the PDD.

Table 7. Estimated project emissions for the period January 1, 2004– December 31, 2007

Year	Estimated project emissions (tons of CO_2 equivalent)
2004	11 840 950
2005	11 589 588
2006	13 606 209
2007	13 743 817
Total estimated project emissions over the period from 2004 to 2007 (tons of CO_2 equivalent)	**50 780 564**

Table 8. Estimated project emissions for the period January 1, 2008 – December 31, 2012

Year	Estimated project emissions (tons of CO_2 equivalent)
2008	15 105 641
2009	13 484 982
2010	14 438 583
2011	14 733 878
2012	14 733 878
Total estimated project emissions over the period from 2008 to 2012 (tons of CO_2 equivalent)	**72 496 962**

Table 9. Estimated project emissions for the period January 1, 2013 - December 31, 2017

Year	Estimated project emissions (tons of CO_2 equivalent)
2013	14 733 878
2014	14 733 878
2015	14 733 878
2016	14 733 878
2017	14 733 878
Total estimated project emissions over the period from 2013 to 2017 (tons of CO_2 equivalent)	**73 669 390**

E.2. Estimated leakage:

Leakages don't take place.

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

Since no leakages are expected the sum of emissions from leakages and from the project activity is equal to the emissions from the project activity. The results are provided in tables below.

Table 10 Table containing sum of emissions from leakages and project activities for the period January 1, 2004– December 31, 2007

Year	Estimated project emissions (tons of CO_2 equivalent)	Estimated leakages (tons of CO_2 equivalent)	Total estimated emissions and leakage (tons of CO_2 equivalent)
2004	11 840 950	0	11 840 950
2005	11 589 588	0	11 589 588
2006	13 606 209	0	13 606 209
2007	13 743 817	0	13 743 817
Total emissions (tons of CO_2 equivalent)	**50 780 564**	**0**	**50 780 564**

Table 11. Table containing sum of emissions from leakages and project activities for the period January 1, 2008 – December 31, 2012

Year	Estimated project emissions (tons of CO_2 equivalent)	Estimated leakages (tons of CO_2 equivalent)	Total estimated emissions and leakage (tons of CO_2 equivalent)
2008	15 105 641	0	15 105 641
2009	13 484 982	0	13 484 982
2010	14 438 583	0	14 438 583
2011	14 733 878	0	14 733 878
2012	14 733 878	0	14 733 878
Total emissions (tons of CO_2 equivalent)	**72 496 962**	**0**	**72 496 962**

Table 12. Table containing sum of emissions from leakages and project activities for the period January 1, 2013 - December 31, 2017

Year	Estimated project emissions (tons of CO_2 equivalent)	Estimated leakages (tons of CO_2 equivalent)	Total estimated emissions and leakage (tons of CO_2 equivalent)
2013	14 733 878	0	14 733 878
2014	14 733 878	0	14 733 878
2015	14 733 878	0	14 733 878
2016	14 733 878	0	14 733 878
2017	14 733 878	0	14 733 878
Total emissions (tons of CO_2 equivalent)	**73 669 390**	**0**	**73 669 390**

E.4. Estimated baseline emissions:

Estimated baseline scenario emissions were calculated in accordance with the formulae specified in section D.1.1.4.

Results are provided in the tables below. Calculations are provided in the Excel file Supporting document 1, attached to the PDD.

Table 13. Estimated baseline emissions for the period January 1, 2004– December 31, 2007

Year	Estimated baseline emissions (tons of CO_2 equivalent)
2004	12 186 428
2005	12 022 108
2006	14 437 145
2007	15 257 280
Total estimated baseline emissions over the period from 2004 to 2007 (tons of CO_2 equivalent)	**53 902 961**

Table 14. Estimated baseline emissions for the period January 1, 2008 – December 31, 2012

Year	Estimated baseline emissions (tons of CO_2 equivalent)
2008	16 527 321
2009	15 074 356
2010	16 284 347
2011	16 859 830
2012	16 859 830
Total estimated baseline emissions over the period from 2008 to 2012 (tons of CO_2 equivalent)	**81 605 684**

Table 15. Estimated baseline emissions for the period January 1, 2013 - December 31, 2017

Year	Estimated baseline emissions (tons of CO_2 equivalent)
2013	16 859 830
2014	16 859 830
2015	16 859 830
2016	16 859 830
2017	16 859 830
Total estimated baseline emissions over the period from 2013 to 2017 (tons of CO_2 equivalent)	**84 299 150**

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

Emission reductions are calculated according to formula described in section D.1.4. Results are provided in the tables below. Calculations are provided in the Excel file Supporting document 1, attached to the PDD.

Table 16. Estimated emission reduction for the period from January 1, 2004– December 31, 2007

Year	Estimated emission reduction (tones of CO_2 equivalent)
2004	345 478
2005	432 520
2006	830 936
2007	1 513 463
Total estimated emission reduction over the period from 2004 to 2007 (tons of CO_2 equivalent)	**3 122 397**

Table 17. Estimated emission reduction for the period from January 1, 2008 – December 31, 2012

Year	Estimated emission reduction (tones of CO_2 equivalent)
2008	1 421 680
2009	1 589 374
2010	1 845 764
2011	2 125 952
2012	2 125 952
Total estimated emission reduction over the period from 2008 to 2012 (tons of CO_2 equivalent)	**9 108 722**

Table 18. Estimated emission reduction for the period January 1, 2013 - December 31, 2017

Year	Estimated emission reduction (tones of CO_2 equivalent)
2013	2 125 952
2014	2 125 952
2015	2 125 952
2016	2 125 952
2017	2 125 952
Total estimated emission reduction over the period from 2013 to 2017 (tons of CO_2 equivalent)	**10 629 760**

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

Table 19. Table containing results of estimation of emission reduction for the period from January 1, 2004 to December 31, 2007.

Year	Estimated project emissions (tones of CO_2 equivalent)	Estimated leakages (tones of CO_2 equivalent)	Estimated baseline emissions (tones of CO_2 equivalent)	Estimated emission reduction (tones of CO_2 equivalent)
2004	11 840 950	0	12 186 428	345 478
2005	11 589 588	0	12 022 108	432 520
2006	13 606 209	0	14 437 145	830 936

2007	13 743 817	0	15 257 280	1 513 463
Total estimated (tones of CO_2 equivalent)	**50 780 564**	**0**	**53 902 961**	**3 122 397**

Table 20. Table containing results of estimation of emission reduction for the period from January 1, 2008 to December 31, 2012

Year	Estimated project emissions (tones of CO_2 equivalent)	Estimated leakages (tones of CO_2 equivalent)	Estimated baseline emissions (tones of CO_2 equivalent)	Estimated emission reduction (tones of CO_2 equivalent)
2008	15 105 641	0	16 527 321	1 421 680
2009	13 484 982	0	15 074 356	1 589 374
2010	14 438 583	0	16 284 347	1 845 764
2011	14 733 878	0	16 859 830	2 125 952
2012	14 733 878	0	16 859 830	2 125 952
Total estimated (tones of CO_2 equivalent)	**72 496 962**	**0**	**81 605 684**	**9 108 722**

Table 21. Table containing results of estimation of emission reduction for the period from January 1, 2013 to December 31, 2017

Year	Estimated project emissions (tones of CO_2 equivalent)	Estimated leakages (tones of CO_2 equivalent)	Estimated baseline emissions (tones of CO_2 equivalent)	Estimated emission reduction (tones of CO_2 equivalent)
2013	14 733 878	0	16 859 830	2 125 952
2014	14 733 878	0	16 859 830	2 125 952
2015	14 733 878	0	16 859 830	2 125 952
2016	14 733 878	0	16 859 830	2 125 952
2017	14 733 878	0	16 859 830	2 125 952
Total estimated (tones of CO_2 equivalent)	**73 669 390**	**0**	**84 299 150**	**10 629 760**

SECTION F. Environmental impacts

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

Transboundary impacts of project activities according to their definitions in the text ratified by Ukraine "Convention on transboundary pollution at a great distance" will not take place. Project implementation does not bring any harmful effects on the environment.

Impact on water

Impact on water resources will be the same as in the baseline scenario. The existing technology of heat generation run at the objects of PJSC "Centrenergo" foresees discharging of waste water to the sewage grid with obligatory chemical control in accordance to Water Code of Ukraine, State Standard 28.74-82 "Hygienic regulations and quality control", Building Standards and Rules 4630-92 on determining maximum concentration limits for internal water bodies.

Effects on ambient air

The project implementation will have positive effect on ambient air:

1) Reduction of GHG emissions through the implementation of measures to improve the production equipment for the production of electricity;
2) Reduction of fuel consumption for electricity production and power generation for own needs of power unit will lead to the air pollutants emissions reduction.

Effects on land use

There is no impact on the land/soil.

Relevant regulation is the sphere of land use is presented by the Land Code of Ukraine. National technological practice/standard: State Standard 17.4.1.02.-83 "Protection of Nature, Soils. Classification of chemical substances for pollution control".

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:

As noted above, in the environmental impact assessment, it is clear that the project does not create any adverse environmental impact, but rather has a positive impact on the environment.

SECTION G. Stakeholders' comments

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

Stakeholders' comments on the project are absent because PDD does not include the negative impact on the environment and the negative social effects that the discussion was not necessary.

Annex 1

CONTACT INFORMATION ON PROJECT PARTICIPANTS

Organisation:	Public Joint Stock Company "Centrenergo"
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URL:	
Represented by:	
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Salution	Mr
Last Name	Chmyrenko
Middle name:	Mikolayovich
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Salution	
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Annex 2

BASELINE INFORMATION

The proposed project uses the specific approach to JI projects based on requirements to JI projects according to paragraph 9 (a) of "Guidance on criteria for baseline setting and monitoring" (Version 03).

Key information for baseline setting is stated in the tables given below.

Data/Parameter	Unit of measurement	Description	Value of data applied
$EF^{y}_{p,tpp,i,c}$	t C/TJ	Coefficient of carbon content in fuel "i" in monitoring period *«y»* project scenario	Refer to Excel file Supporting document 1
$OXID^{y}_{p,tpp,i}$	relative units	Carbon oxidation factor in the course of fuel "i" combustion in monitoring period *«y»* project scenario	Refer to Excel file Supporting document 1
$NCV^{y}_{p,tpp,i}$	GJ/(ths m^3 or t)	Net calorific value of fuel "i" in monitoring period *«y»* project scenario	Refer to Excel file Supporting document 1
$W^{y}_{p,tpp,i}$	%	Percentage of fuel "i" from consumption of reference fuel in monitoring period *«y»* project scenario	Refer to Excel file Supporting document 1
$EG^{y}_{p,tpp,i,rf}$	ths kW*h	Total amount of supplied electricity in monitoring period *«y»* project scenario	Refer to Excel file Supporting document 1
$FC^{j}_{b,tpp,i,rf}$	trf (tones of reference fuel)	Total amount of reference fuel combustion in historical period *«j»* baseline scenario	Refer to Excel file Supporting document 1
$EG^{j}_{b,tpp,i,rf}$	ths kW*h	Total amount of supplied electricity in historical period *«j»*, baseline scenario	Refer to Excel file Supporting document 1

Detailed information about the baseline scenario is provided in section B.1.

Annex 3

MONITORING PLAN

The proposed project uses the specific approach to JI projects based on requirements to JI projects according to paragraph 9 (a) of "Guidance on criteria for baseline setting and monitoring" (Version 03).

Monitoring plan provides for the following measures:
1. Collection of information on GHG emissions reduction within the project during the crediting period.
2. Assessment of the project implementation schedule.
3. Collection of the information on measurement equipment, its calibration.
4. Collection and archiving information on the impact of project activities on the environment.
5. Data archiving.
6. Determination of the structure of responsibility for project monitoring.
7. Analysis of organization of personnel training.

$EF^{y}_{p,tpp,i,c}$	Coefficient of the carbon content in fuel "i" in monitoring period *«y»* baseline scenario, t C/TJ
$OXID^{y}_{p,tpp,i}$	Carbon oxidation factor in the course of fuel "i" combustion in monitoring period *«y»* project scenario, relative units
$NCV^{y}_{p,tpp,i}$	Net calorific value of fuel "i" in monitoring period *«y»* project scenario, GJ/(ths m^3 or t)
$W^{y}_{p,tpp,i}$	Percentage of fuel "i" from consumption of reference fuel in monitoring period *«y»* project scenario, %
$EG^{y}_{p,tpp,i,rf}$	Total amount of supplied electricity in monitoring period *«y»* project scenario, ths kW*h
$FC^{y}_{p,tpp,i,rf}$	Coefficient of the carbon content in fuel "i" in monitoring period *«y»* baseline scenario, t C/TJ