JOINT IMPLEMENTATION PROJECT

"Reduction of methane emissions on the gas equipment of gas distribution points, gas armature, flanged and threaded joints of gas distribution networks of PJSC "Poltavagaz"

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

Director, CEP Carbon Emissions Partners S.A.		Fabian Knodel
(position)	(signature)	(name and patronymic, last name)

PS

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

The Head of the Board		
PJSC «Poltavagaz»		Grynchak R.I.
(position)	(signature)	(name and patronymic, last name)

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

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Annexes

LIST OF ABBREVIATIONS PRESENTED IN PDD

CDM - Clean Development Mechanism
CGDP - Cabinet-type gas distribution point
GDP – Gas distribution point
JI – Joint Implementation
LDAR - Leak Detection and Repair
NCER – National Commission of Energy Regulation
PDD – Project Design Document
PJSC - Public joint-stock company
PETM – Purposeful Examination and Technical Maintenance
UGSSR – Ukrainian Gas Supply System Safety Rules

SECTION A. General description of the project

A.1. Title of the project:

Reduction of methane emissions on the gas equipment of gas distribution points, gas armature, flanged and threaded joints of gas distribution networks of PJSC "Poltavagaz"

Sectoral scope 10. Fugitive emissions from fuels (solid, oil and gas)

Version of Project Design Document: 03

Date: February15, 2012.

A.2. Description of the project:

The purpose of the project is reduction of the natural gas leaks at gas transportation and gas distribution infrastructure of PJSC "Poltavagaz". These leaks are the result of leaking gas equipment and gas fittings. The basic sources of leaks, included into the project boundary are:

- gas equipment (reducing gears, valves, filters, break switches, etc.), flanged and threaded joints located at gas distribution points (GDPs) and cabinet-type gas distribution points (CGDPs) of PJSC “Poltavagaz”;
- gas fittings (faucets, valve gates, screw valves, etc.), threaded and flanged joints located at gas pipelines of PJSC “Poltavagaz”.

The project boundary encompasses 642 GDPs, 1 852 CGDPs, and 5 047 gas fitting units at gas pipelines.

The main reason of natural gas leaks is failure of sealing elements of equipment caused by temperature fluctuations and moisture. Basic component of natural gas is methane (92 - 95%), which is greenhouse gas. Repair of natural gas leaks will result in a reduction of greenhouse gas emissions. Hereinafter, for determination of natural gas leaks the term “methane leaks” is used, since leak measurements refer to methane.

Situation existing prior to the start of the project

PJSC “Poltavagaz” is an enterprise that provides transportation and supply of natural gas to industrial enterprises (689), public-service facilities (4543), consumers and population (369 879 apartments and individual accomodation units) in the city of Poltava, towns and settlements of Poltava region, Ukraine.

The structure of existing tariffs for gas transportation regulated by the state does not take into account the amortization and investment needs of gas distribution enterprises. This leads to a lack of financing for repair works and modernization of gas networks, purchase of proper technological equipment and components, and, as a result, contributes to the increase of natural gas leaks at PJSC “Poltavagaz” facilities.

Before the launch of this project, an application of Joint Implementation Mechanism provided for by the Kyoto Protocol was planned. For this purpose, Moston Properties Limited and PJSC “Poltavagaz” signed Memorandum of understanding relating to the JI Project in February 2005.

Baseline scenario

Prior to the start of the Project (2005) PJSC "Poltavagaz" carried out only the detection of methane leaks by gas detectors in accordance with Ukrainian Gas Supply System Safety Rules[1]. The company detected methane leaks with the purpose of avoidance of emergency and explosive situations. Measurings of methane leak volumes, their registration and accounting were not conducted, and the proper measuring devices were absent. Theoretical calculations of methane leak volumes that were made on the basis of the conducted basic measurings of natural gas losses as a result of leakage of equipment, gas fittings, flanged and threaded joints of PJSC "Poltavagaz" gas pipelines amounted to about 75million m^3 per year.

Project scenario

Project activities consist in the reduction of methane leaks that occur as a result of faulty sealing of gas equipment of GDPs (CGDPs) and gas fittings of PJSC «Poltavagaz» gas pipelines.

Within the framework of the JI project in order to repair methane leaks at gas equipment and gas fittings three types of repairs are applied:

1. Complete replacement of old gas equipment and gas fittings with new units.
2. Repair of components of gas equipment and gas fittings.
3. Replacement of pressure-sealing elements with the use of modern sealing materials, changing the common practice of servicing and repair on the basis of paronite gaskets and sealing stuffing of cotton fibre with fatty impregnation and asbestos-graphite filler.

The existing practice of servicing and repair on the basis of paronite gaskets and sealing stuffing of cotton fibre with fatty impregnation and asbestos-graphite filler does not give a long-lasting effect of methane leak reductions.

As a result of JI project activities, in addition to methane leak reductions, technical losses of natural gas will decrease, a contribution will be made to the improvement of environmental situation, and the risk of accidents and explosions will be reduced.

Project activities will include:

- Implementation of Purposeful Examination and Technical Maintenance (PETM) of gas equipment of GDPs (CGDPs) and gas fittings, flanged and threaded joints. This is a modern and the most economically effective practice, which provides possibilities of not only detection of leak points but also determination of leak volume (i.e., potential gas leak reductions). This key information is required for substantiation of efficiency of repair works and priority choice of its objects, which is important under short financing for repair of all leaks. This activity will include the purchase and calibration of modern metering equipment, appropriate training of employees, monitoring of all gas equipment and fittings as well as flange and threaded joints, creation of leak data collection and storage system, and implementation of internal audit and quality assurance system for repair and accounting of methane leaks;
- Detection and measurement of methane leaks: leak monitoring system at all gas equipment of GDPs (CGDPs), gas fittings (gate valves, faucets, screw valves), flanged and threaded joints, including repaired methane leaks (repaired components of equipment). Monitoring will be carried out on a regular basis by specially trained staff. Detected leak points will be duly marked with individual numbers; methane leak volumes will be measured and registered in the database;
- Repair of all leaks detected: repairs of leaking gas equipment of GDPs (CGDPs) and gas pipeline fittings under this project will vary from replacement of sealing elements by using pressure-sealing or new materials to major overhauls and replacement of gas equipment and gas fittings by new modern equipment. The repaired components of GDP (CGDP) gas equipment

[1]The Order of The State Committee of Ukraine on supervision of a labor safety Nr. 254 on 01/10/1997, registered in the Ministry of Justice of Ukraine Nr. 318/2758 on 15/05/1998.

and gas pipeline fittings will be inspected regularly, as a part of standard monitoring activity, to make sure that they did not become the source of leaks again.

The project was initiated in February 2005:

In February 2005 an inspection of GDP (CGDP) gas equipment and gas fittings, flanged and threaded joints of gas pipelines of PJSC «Poltavagaz» and primary leak metering took place, the results of these measurements made the basis for setting the project baseline.

04/02/2005 – Moston Properties Limited (UK) and PJSC «Poltavagaz» signed the Memorandum of Understanding relating to the JI project. It was also stipulated in the contract, that Moston Properties Limited had to develop the emission monitoring programme and the JI Project Design Document (PDD).

07/02/2005 – a Working Team was created in order to ensure compliance with the JI project monitoring plan.

17/02/2005 – PJSC «Poltavagaz» approved the PDD (version 01), which included the programme of emission monitoring.

February 2005 – the start of inspection and repair works at GDP (CGDP) gas equipment and gas fittings, flanged and threaded joints of gas distribution networks of PJSC «Poltavagaz».

10/12/2010 – with the consent of PJSC «Poltavagaz», Moston Properties Limited assigned all its rights and obligations under the Memorandum of Understanding relating to the JI project to CEP Carbon Emissions Partners S.A. (Switzerland); on this ground CEP Carbon Emissions Partners S.A. and PJSC «Poltavagaz» signed an Emission Reductions Purchase Agreement relating to the JI project dated 14/07/2011.

10/11/2011 – due to changes in organizational structure, new line-up of the Working Team was approved.

13/12/2011 – obtaining of a Letter of Endorsement № 3602/23/7 from the State Environmental Investment Agency of Ukraine.

23/01/2012 – obtaining of a Letter of Approval № J294-0485 from the Federal Office for the Environment of Switzerland (FOEN).

The project has unlimited lifetime as programmes of PETM, monitoring and leak repair are aimed at becoming a part of PJSC «Poltavagaz» operational routine. Reduction of t CO_2 emissions is claimed for the period of 12 years and 11 months in accordance with modality and procedures of JI Mechanism.

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

A.4. Technical description of the project:

A.4.1. Location of the project:

The Project is located in the territory of Poltava city, towns and villages of Poltavskyi, Reshetylivskyi, Velyko-Bohachivskyi, Hlobinskyi, Dykanskyi, Zenkovskyi, Karlivskyi, Kobylyatskyi, Lokhvytskyi, Mashevskyi, Mirhorodskyi, Novo-Sanzharskyi, Chutovskyi districts of Poltava region, Ukraine. (Figure 1).

Figure 1. The map of Ukraine with indication of of Poltava region

A.4.1.1. Host Party(-ies):

The Project is located in the territory of Ukraine.

Ukraine is an Eastern European country that ratified the Kyoto Protocol to the UN Framework Convention on Climate Change on February 4, 2004. It is listed in Annex 1 and meets the requirements of participation in Joint Implementation projects.

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

The Project is located in the territory of Poltava city, towns and villages of Poltavskyi, Reshetylivskyi, Velyko-Bohachivskyi, Hlobinskyi, Dykanskyi, Zenkovskyi, Karlivskyi, Kobylyatskyi, Lokhvytskyi, Mashevskyi, Mirhorodskyi, Novo-Sanzharskyi, Chutovskyi districts of Poltava region, Ukraine.

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

Poltava city, 9 towns, 18 urban villages, 1015 villages of Poltava region, Ukraine.

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

The geographical coordinates of Poltava city are the following:
Latitude: 49° 36' NL
Longitude: 34° 33' EL
Time zone: GMT +2:00

Poltava Region is located in the middle part of the Left-Bank Ukraine. Most part of the region lies within the Dnieper lowland. It borders on Chernihiv and Sumy regions in the North, Kharkiv region - in the East, Dnipropetrovsk and Kirovohrad regions - in the South, Kiyv and Cherkassy regions in the West. The length of the territory from the North to the South is 213.5 km. The length of the territory from the West to the East is 245 km. Poltava region is located in the forest-steppe zone. Forests cover 8.5% of the territory; soil is mostly medium-humus black soils. 146 rivers flow in the territory of the region; their total length is 5101 km. Rivers of the region belong to the basin of the Dnieper river: left tributaries are the Sula river, the Psel river, the Vorskla river, the Oril river. The region is washed by water of Kremenchuh and Dniprodzerzhynsk water reservoirs in the South and South-West.

A complete list and addresses of gas distribution points (642 units), cabinet-type gas-distribution points (1852 units) and gas fittings (5047 unit), that are included in the project boundary, is provided in Supporting Document 1 - "Registry of gas distribution points, cabinet-type gas distribution points, gas fittings of gas distribution networks of the Joint Implementation Project"[2].

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

1. Development and introduction of methane leak measuring method

To measure methane leak volumes the proposed project applies a JI Specific Approach that is based on technology of "calibrated bag" described in the approved CDM methodology AM0023 "Leak detection and repair in gas production, processing, transmission, storage and distribution systems and in refinery facilities" version 4.0[3]. When using this methodology it is difficult to take into account the volume of fitting where the measurements are carried out and the initial volume of air when determining the gas volume that inlets into the bag.

The problem was solved by manufacturing of a special unit on the basis of a plastic tank of a known volume (0.11 m^3), a package, a plastic hose and a manometer. A photo of the unit for measurement of methane leaks is provided in Figure 2.

[2]Supporting document 1 to the PDD of the JI project "Reduction of methane emissions on the gas equipment of gas distribution points, gas armature, flanged and threaded joints of gas distribution networks of PJSC "Poltavagaz", "Registry of gas distribution points, cabinet-type gas distribution points, gas fittings of gas distribution networks of the Joint Implementation Project" is executed in an electronic form and submitted to the State Environmental Investment Agency of Ukraine and Bureau Veritas Certification Holding SAS – a company that verifies the project.

[3]3"Leak detection and repair in gas production, processing, transmission, storage and distribution systems and in refinery facilities", version 4.0 (http://cdm.unfccc.int/filestorage/L/V/8/LV8NU1GYWTK06COJPDIXQ35FR2MA47/EB63_repan14_AM0023_ver04.0.0.pdf?t=MHN8bHp1OXB3fDB0PGB8sMZWRjdI6i2XLvb6)

Figure 2. Photo of a device for quantitative measurement of methane leaks

Gas analyzer Variotec® 8-EX. In order to determine methane concentration in a sample a high-accuracy gas analyzer Variotec® 8-EX**.** is used. Its photo is provided in Figure 3.

Figure 3. Photo of gas analyzer Variotec® 8-EX.

The gas analyzer has the following characteristics:
- explosion-proof (CENELEC);
- calibration: Methane CH_4 /natural gas, propane C_3H_8;
- methane detection in the process of control of pipeline networks (ppm range);
- gas detection at the internal installations (ppm range);
- alarm when approaching the lower explosion limit (%UEG or Vol.%-range);
- measurement of concentration upon gas contamination and inertisation of lines (Vol.%-range);
- measurement of concentration in probe aperture (Vol.%-range).

Relative error makes 10%, which is in line with EN 50054/57 Standard[4].

After leak detection and measurement repair or replacement of GDP (CGDP) gas equipment and gas fittings of gas pipelines is carried out with the use of modern sealing materials (GOST 7338-90[5], GOST 5152-84[6] or GOST 10330-76[7]).

Detailed information on the measuring methods used in leak monitoring is provided in the Annex 3.

2. Introduction of modern sealants for leak repair.

Sealants (sealing agents) GOST 7338-90 are oil-and-petrol-resistant plates used for making of rubber-technical wares, that serve for the compression of immobile connections, prevention of friction between metallic surfaces, single shock load accommodation; the sealants are also used for making gaskets, flooring and other sealing wares.

Greasing of locking devices and compression of the threaded connections with flax fibres GOST 10330-76 and oil Plitol-M (TU U 25404313.004-2201)

[4]Electrical apparatus for the detection and measurement of combustible gases). General requirements and test methods.
[5] "Rubber and Rubber-fabric Planes"
[6] "Sealing Stuffing"
[7] "Dishevelled flax. Specifications"

Sealing stuffing GOST 5152-84. Asbestine wattled sealing stuffing is used for the compression of sealing of stuffing armature chambers, centrifugal and piston pumps, and also different devices at working temperatures from - 70 to 300˚C.

Wattled sealing stuffing is the most widespread type of sealing materials, used to seal stuffing armature chambers, centrifugal and piston pumps, different devices. This stuffing is used to complete more than 80% of armature. They differentiate both in materials they are made of and methods of making (by structure). Both factors substantially influence operating properties of stuffing. The important components of stuffing are different types of impregnations and fillers that give necessary properties to stuffing.

3. Replacement of shut-off and control valves.

Shut-off and control valves. Within the framework of the Project it is also planned to replace old GDP (CGDP) gas equipment as well as shut-off and control valves of the USSR production with the equipment and shut-off and control valves of European producers and their analogues of national production.

4. Installation of centralized natural gas leak accounting system.

During implementation of the Project producers of gas equipment that is used for prevention of methane leaks can be changed depending on the appearance of more modern and perfect technologies and equipment in the market.

The choice of equipment and materials will depend on the size, source of leaks and operating schedule of system component where this leak was detected by the use of modern PETM of gas distribution networks, including:

- studying of basic conditions – when using measuring devices described above;
- registration of the results and determination of priority in repair of leaks, which ensures the highest efficiency of this work upon scarcity of means for repair.
- data analysis and evaluation of reduction of natural gas leaks and volumes of emission reduction.
- development of plan of future inspections, and further monitoring of gas equipment of GDPs (CGDPs), gas fittings, threaded and flanged joints of PJSC "Poltavagaz" gas pipelines, inclined to leak, as well as monitoring of leaks that have already been repaired.

Implementation Schedule

1. Drawing of the primary registry of GDP (CGDP) gas equipment, gas fittings, threaded and flanged connections of gas pipelines. Inspection of GDP (CGDP) gas equipment, gas fittings, threaded and flanged connections of gas pipelines and primary monitoring measurements. Signing of the Memorandum of understanding relating to the Joint Implementation Project. Organization of the Working Team. Development of the monitoring Plan, the PDD of the project, version 01. (February 2005).
2. Introduction and implementation of the PETM programme, repair (replacement) of gas equipment: 498 GDPs (CGDPs) and 1009 fittings (February - December 2005).
3. Implementation of the PETM programme, repair (replacement) of gas equipment: 998 GDPs (CGDPs) and 2018 fittings (January - December 2006)
4. Implementation of the PETM programme, repair (replacement) of gas equipment: 749 GDPs (CGDPs) and 1514 fittings (January - December 2007).
5. Implementation of the PETM programme, repair (replacement) of gas equipment: 249 GDPs (CGDPs) and 506 fittings (January - December 2008)

6. Continuation of implementation of the PETM programme, implementation of regular monitoring inspections and measurements at already repaired gas equipment of GDPs (CGDPs) and fittings of gas pipelines, leak repair at already repaired equipment, if such leaks take place (January 2009 - December 2017)

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

The project activity includes:
- repair (replacement) of GDP (CGDP) gas equipment, gas fittings, sealing of threaded and flanged connections of PJSC "Poltavagaz" gas pipelines with the use of modern sealing materials and modern equipment of the European producers and their analogues of national production;
- monitoring of methane leaks aimed at the detection of methane leaks caused by sealing failures;
- further renewal of sealing of GDP (CGDP) gas equipment, gas fittings, threaded and flanged connections of gas pipelines.

Reduction of natural gas leaks will result in reduction of emissions of methane that is greenhouse gas.

Absence of the Project activity means that all equipment, including old units, that are still capable of working, and equipment characterized by worse leak-proofness than the one planned in the project activity, will be operated for a long time in the ordinary mode. This makes it impossible to reduce methane emissions.

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

The following emission reductions will be achieved during the Project implementation at each stage of the Project:

Table 1. Estimated amount of emission reductions in t CO_{2e} (2005-2007)

	Years
Length of the crediting period	3
Year	Estimate of annual emission reductions in tonnes of CO_2 equivalent
2005	123 347
2006	431 713
2007	740 080
Total estimated emission reductions over the crediting period (2005 – 2007) (tonnes of CO_2 equivalent)	1 295 140
Annual average of estimated emission reductions over the crediting period (tonnes of CO_2 equivalent)	431 713

Table 2. Estimated amount of emission reductions in t CO_{2e}. (2008-2012)

	Years
Length of the crediting period	5
Year	Estimate of annual emission reductions in tonnes of CO_2 equivalent
2008	894 263
2009	925 100
2010	925 100
2011	925 100
2012	925 100
Total estimated emission reductions over the crediting period (2008 – 2012) (tonnes of CO_2 equivalent)	4 594 663
Annual average of estimated emission reductions over the crediting period (tonnes of CO_2 equivalent)	918 933

Table 3. Estimated amount of emission reductions in t CO_{2e}. (2013-2017)

	Years
Length of the crediting period under the post-Kyoto Mechanism	5
Years	Estimate of annual emission reductions in tonnes of CO_2 equivalent
2013	925 100
2014	925 100
2015	925 100
2016	925 100
2017	925 100
Total estimated emission reductions over the crediting period (2013 – 2017) (tonnes of CO_2 equivalent)	4 625 500
Annual average of estimated emission reductions over the crediting period (tonnes of CO_2 equivalent)	925 100

A description of formula used for calculation of emission reductions is provided in sub-section D.1.4.

Functioning of the leak detection and repair system, and further maintenance of leak-proofness of GDP (CGDP) gas equipment, gas fittings, threaded and flanged connections of PJSC "Poltavagaz" gas pipelines, that are created within the framework of the Project, do not have any limitations in terms of duration. Therefore the Project will generate methane emission reductions after completion of the crediting period.

A.5. Project approval by the Parties involved:

The Project has been already supported by the Government of Ukraine, namely by the State Environmental Investment Agency of Ukraine, which issued a Letter of Endorsement for the JI Project (No. 3602/23/7 as of 13/12/2011).
The project has already received an approval from the Swiss Government, namely the Federal Office for the Environment (FOEN) of Switzerland, which issued the Letter of Approval of JI project No.J294-0485 dated 23/01/2012.
Therefore, organizational risk for the JI Project is minimized.

Upon the receipt of the Determination Report from the Accredited Independent Entity the Project Design Documents will be submitted to the State Environmental Investment Agency of Ukraine to receive a Letter of Approval.

SECTION B. Baseline

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

1. Baseline setting approach.

To set the baseline (measurement and calculation of methane leaks) the JI specific approach based on approved CDM methodology AM0023 "Leak detection and repair in gas production, processing, transmission, storage and distribution systems and in refinery facilities", Version 4.0 was applied. The modification of methodology AM0023 version 4.0 was caused by application of more accurate method of methane leak measurements.
The baseline was chosen according to the requirements of "Guidance on criteria for baseline setting and monitoring", version 03, according to the Guidance for users of Joint Implementation Project Design Document form, version 04.

Methodology AM0023 version 4.0 is applicable to the projects on natural gas leak reduction in compressor, gas distribution stations of gas pipelines, as well as at the equipment of gas distribution systems, including gas pressure control stations.

This methodology is applicable to project activities that reduce physical natural gas leaks in natural gas pipeline compressor stations by establishing advanced leak detection and repair practices, being the supplement to conventional Leak Detection and Repair program (LDaR).
Conventional LDaR program that existed at PJSC "Poltavagaz" before the Project implementation met the requirements of Ukrainian Gas Supply System Safety Rules and included leak detection by means of gas detectors, which fixed only presence or absence of natural gas leaks in order to avoid emergency and explosive situations.
In the course of the Project implementation PETM program of GDP (CGDP) gas equipment and gas fittings of PJSC "Poltavagaz" gas distribution networks, as described in paragraph "Project scenario" in section A.2 of the PDD, essentially, is the implementation of advanced LDaR program.

To use the proposed JI Specific Approach for baseline setting the following three conditions shall be satisfied:

1. Natural gas pipeline operators have no current LDaR program in place to systematically identify and repair leaks;
2. Methane losses (leaks) can be identified and accurately measured;
3. A monitoring system can be put in place to ensure leaks repaired remain repaired.

The Project fully complies with the second and the third conditions; it also complies with the first condition but there are some remarks relating to this condition. They are stated below.

Information relating to the *first condition*: before the beginning of the project PJSC "Poltavagaz" provided only the detection of leaks by means of gas detectors in accordance with Ukrainian Gas Supply System Safety Rules in order to avoid emergency and explosive situations. The measurements of the volumes of leaks, their registration and accounting were not carried out, and appropriate measuring devices were absent. The theoretical calculations of leak volumes, that were made on the basis of the initial measurements made, amount to about 75million m^3 per year.

But aforementioned measures do not give understanding of the real volumes of leaks caused mainly by the use of old equipment and worn out sealing materials. The Project does not provide for more frequent checks of gas equipment, but it is planned to use modern sealing material, replace old gas equipment

with the new, modern equipment of European production or their analogues of national production and implement the monitoring measuring of methane leak volumes.

According to international experience and the data received from the regions, where new sealing materials and gas equipment were used, it can be concluded that their use considerably reduced the volumes of methane leaks.

In addition, due to the fact that the national legislation doesn't provide any mechanisms for encouragement of operators to reduce natural gas leaks, effective program for detection and repair of methane leaks could not be applied without the project activities. The operators which were mainly motivated by the safety conditions could only detect a leak, but could not measure its volume.

In other words, we want to emphasize that the practice that existed at PJSC "Poltavagaz" before the beginning of the Project implementation didn't repair the leaks included into this Project.

Information relating to *the second condition:* The purchase of modern equipment on detection and measurement of methane leak volumes and direct measurements of leak volumes at GDP (CGDP) gas equipment and gas fittings demonstrated that when applying modern practices and gas equipment not only the leaks may be detected and repaired but also they can be exactly measured.

Information relating to the *third condition:* Introduction of step-by-step procedures, creation of the comprehensive database and application of a system approach will allow conducting the reliable monitoring of the repaired GDP (CGDP) gas equipment and gas fittings of gas pipelines and detecting leaks that occurred again after being repaired, if any (see Annex 3). The trainning of personnel at sites and introduction of quality control at all stages of the project activity will allow implementing the Monitoring Plan.

2. Application of selected approach to baseline setting

Initial conditions

Only two options of baseline conditions can be considered as possible and reliable alternatives to the Project:

1. Continuation of the current system for detection and repair of leaks;
2. Implementation of this Project not as a JI project.

Arguments that are presented in this PDD (see section B.2) prove that continuation of the existing practice of leak detection and repair is the most plausible scenario on condition of theabsence of the Project.

Therefore, this scenario can be viewed as the Baseline.

Emission Reductions

The method for determination of leak volumes according to the Methodology AM0023 version 4.0 consists in preliminary estimation of leaks with further determination of their actual volumes.

In accordance with Methodology AM0023 version 4.0, the level of emission reductions is determined in the following order:

1. The current practice of leak detection and repair activities is assessed and described.

2. Clear and transparent criteria are established to identify whether the detection and repair of a leak would also have occurred in the absence of the project activity.
3. The time schedules for replacement of equipment in the absence of the project activity are determined.
3. Data on leaks is collected during project implementation.
4. The functioning of leak repair is checked during monitoring.
5. Emission reductions are calculated ex-post based on data collected in the previous steps.

These steps for this Project are described below.

Step 1. Assessment and description of the current leak detection and repair practices

Methodology AM0023 version 4.0 stipulates that for the calculation of emission reductions only those emissions, which are not detected and repaired in accordance with the current practice, are taken into account. The Project used the JI Specific Approach based on methodology AM0023, version 4.0. The difference between the JI Specific Approach and methodology AM0023, version 4.0, is in the the method of methane leak volume measuring. The method of methane leak volume measuring that is used in this Project is presented in Step 3 below and Annex 3 to this PDD.

Before the beginning of the Project PJSC "Poltavagaz" provided only the detection of leaks by means of gas detectors in accordance with Ukrainian Gas Supply System Safety Rules in order to avoid emergency and explosive situations. The measurements of the volumes of leaks, their registration and accounting were not carried out

Before the Project implementation PJSC "Poltavagaz" didn't take any measures on direct inspection and maintenance beyond the scope of requirements established by the safety rules. Traditional material used in the course of repair works provided only for temporary repair of methane leaks, while approach provided by the Project ensures reliable long-term repair of methane leaks.

Gas equipment of GDPs (CGDPs), gas fittings, flanged, threaded joints of gas pipelines included in the project boundary will be examined, repaired or replaced, not regarding the fact that they are regularly inspected and repaired within the existing maintenance system. Repair and replacement under the Project will be performed with the use of modern equipment of the European production, their analogues of national production, and new sealing materials, without regard to whether the leak has been detected or not, in order to prevent leaks in the future.

Step 2. Replacement schedules for equipment

Starting from February 2005, when methane leaks were detected repair or replacement of GDP (CGDP) gas equipment, gas fittings of gas pipelines were carried out with the use of modern equipment and materials, in accordance with the project activity.

Inclusion (into calculation of methane emission reductions) of any similar cases of replacement of components with application of materials and equipment that were used before the project practice is not appropriate, since they will not cause any substantial influence on the result of the Project, i.e. on the level of reduction of methane emissions.

Here it is also important to indicate that under this Project all gas equipment of GDPs (CGDPs), gas fittings, flanged and threaded joints of gas pipelines will be repaired or replaced, even if leaks are detected only on part of them.

Step 3. Data collection during project implementation

Collection of data on methane emission volumes is conducted together with implementation of repairs (replacements) of gas equipment of this Project. Detection of natural gas leaks is executed by means of gas analyzers that operate on the basis of catalytic oxidization/heat-conducting. Repair works (replacement of equipment) are carried out after measuring of volumes of methane leaks were carried out. For measuring of leak volumes of methane (which is in composition of natural gas) the methodology worked out by Moston Properties Limited in 2005 is used. Methodology is based on the use of a device which is a part of a leak-proof tank of the known volume, gas analyzers EX-TEC® SR5 (EX-TEC® HS 680 or Variotec 8-EX), plastic package and connecting hoses (see Annex 3).

In terms of the principle, the methodology of Moston Properties Limited is very similar to the method of the "Calibrated bag" that was applied in methodology AM0023 version 4.0.

But the methodology of Moston Properties Limited has no disadvantages which are typical for the "Calibrated bag" method, namely:

- Use of leakproof bag does not allow making precise measurement because of very difficult determination of initial volume of the let-out bag;
- Use of the package (bag) does not allow permanent control of methane concentration in it, which can result in creation of combustible mix of methane and air; working in such conditions is hazardous even when using antistatic bag;
- Use of leakproof package (bag) does not allow precise measuring of background concentration of methane in package (bag).

After repair (replacements) of gas equipment the new measuring is carried out, to make sure that methane leaks are repaired.
The data collected are included into the reports on fulfillment of the monitoring plan. All data are kept in a database. Every report on fulfillment of the monitoring plan will include complete information from such database (Annex 3 to this PDD).

Step 4. Monitoring requirements

At Step 4 in the process of the Project implementation supervision of the facilities of the Project is carried out to verify whether methane leaks repaired remain repaired. The Monitoring Plan for this Project refers to all repaired (replaced) gas equipment of GDPs (CGDPs), gas fittings, flanged and threaded connections of gas pipelines. Frequency of leak detection and measuring activity at sites where leaks were already repaired, is specified in the Monitoring Plan.

For gas equipment, where methane leak volumes that were detected again, do not exceed the leak volumes, measured after the first repair (replacement) of equipment, methane leaks will be equal to the volume of leaks, measured after the first repair (replacement) for the entire period since the last inspection/monitoring.

If methane leak volumes that were detected again, exceed the leak volumes, measured after the first repair (replacement) of equipment, such equipment will be excluded from the calculations of reduction of methane emissions for corresponding monitoring period. It will be considered that at this equipment there was no reduction of methane emissions during the period from the date of the last monitoring of methane emissions measuring. This corresponds to the requirements of methodology AM0023 version 4.0. Such equipment will be repaired (or replaced) repeatedly. Then measuring of methane leaks will be carried out once again.

The monitoring measurements of methane leaks are carried out with the use of measuring equipment, accuracy of which is not worse than accuracy of measuring equipment, which was used to measure methane emissions during the initial examination.

The collected data will be included into the regular reports on fulfillment of the monitoring plan. All data are kept in a database. Each report on fulfillment of the monitoring plan will include complete information from such database (Annex 3 to this PDD).

Step 5. Calculation of methane emission reductions

The reduction of methane emissions, obtained as a result of the Project implementation, is defined as the difference between emissions measured before the repair (Step 3), and emissions after the repair (Step 4). In the (hypothetical) case when emissions after the repair are higher than emissions measured before the repair, there will be negative reduction of methane emissions for the corresponding component. In other words, the used methodology provides for the case, when methane emissions after implementation of the Project exceed baseline emissions.

Description of the baseline and justification of its choice are presented in the section B.2. below.

Key information for determination of the baseline is presented below.

Key information for the baseline determination.

Data/Parameter	i
Data unit	Dimensionless
Description	Sequence number of GDP (CGDP) gas equipment, gas fittings of gas pipeline where methane leak is detected
Time of determination/monitoring	Once at the beginning of Project
Source of data (to be) used	Activity on leak measurements
Value of data applied (for ex ante calculations/determinations)	-
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Methodology AM0023 version 4.0
QA/QC procedures (to be) applied	Personnel will have corresponding qualification for fixing of results.
Any comment	List of GDP (CGDP) gas equipment, gas fittings, flanged, threaded connections is presented in the Supporting document 1

Data/Parameter	T_i
Data unit	hour
Description	Time (hours) when relevant unit of equipment where methane leak was detected was in operation during a year
Time of determination/monitoring	Constantly
Source of data (to be) used	Records of inspection results

Value of data applied (for ex ante calculations/determinations)	-
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Methodology AM0023, version 4.0
QA/QC procedures (to be) applied	Personnel will have corresponding qualification for fixing of results.
Any comment	Time (hours) of equipment operation during a year from the moment of its repair (replacements)

Data/Parameter	GWP_{CH4},
Data unit	tCO_2e / tCH_4
Description	Global Warming Potential for methane
Time of determination/monitoring	Permanent
Source of data (to be) used	IPCC
Value of data applied (for ex ante calculations/determinations)	21
Justification of the choice of data or description of measurement methods and procedures (to be) applied	-
QA/QC procedures (to be) applied	-
Any comment	The Project developer will perform monitoring of any changes in the Global Warming Potential for methane, published by IPCC **(**IPCC Second Assessment Report: Climate Change 1995 (SAR)) and agreed upon by the COP. The value of GWP for methane is provided on the UNFCCC web-site: http://unfccc.int/ghg_data/items/3825.php

Data/Parameter	$F_{CH4,i}$
Data unit	m^3 CH_4/h
Description	Methane leak rate for each detected leak
Time of determination/monitoring	Before repair and after repair/Annually
Source of data (to be) used	Calculation
Value of data applied (for ex ante calculations/determinations)	-
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Calculation according to Methodology AM0023 version 4.0
QA/QC procedures (to be) applied	Equipment is calibrated and verified according to the quality management procedures. Regular maintenance is carried out according to the technical specifications.

Any comment	-

Data/Parameter	t_i
Data unit	^0C
Description	Gas temperature
Time of determination/monitoring	Permanent / Periodically
Source of data (to be) used	Mercury-in-glass thermometer of TL-4 type or other types, wich are in line with GOST 8.279[8]
Value of data applied (for ex ante calculations/determinations)	-
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Methodology AM0023 version4.0
QA/QC procedures (to be) applied	Equipment is calibrated and verified according to the quality management procedures. Regular maintenance is carried out according to the technical specifications.
Any comment	The parameter is measured to determine of CH_4 density.

Data/Parameter	P_i
Data unit	MPa
Description	Gas pressure
Time of determination/monitoring	Constantly / Periodically
Source of data (to be) used	Barometer aneroid BAMM-1 or M-67 or other types, which correspond to TU 25-04-1797-75[9]
Value of data applied (for ex ante calculations/determinations)	-
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Methodology AM0023 version 4.0
QA/QC procedures (to be) applied	Equipment is calibrated and verified according to the quality management procedures. Regular maintenance is carried out according to the technical specifications.
Any comment	The parameter is measured to determine of CH_4 density.

Data/Parameter	*Vbag*
Data unit	m^3
Description	Tank capacity
Time of determination/monitoring	Once, at the beginning of the Project
Source of data (to be) used	Flowmeter
Value of data applied	0.11 m^3

[8] Standart "Glass, liquid, operating thermometers. Calibration methods and means"

[9] «Control barometre aneroid. General technical conditions»

(for ex ante calculations/determinations)	
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Methodology AM0023 version 4.0
QA/QC procedures (to be) applied	Equipment is calibrated and verified according to the quality management procedures. Regular maintenance is carried out according to the technical specifications.
Any comment	Tank is filled with water. Amount of water measured by flow meter will make tank capacity Measurement showed that tank capacity is 0.11 m^3.

Data/Parameter	$w_{sampleCH4,i}$
Data unit	%
Description	Methane concentration in a tank
Time of determination/monitoring	Periodically
Source of data (to be) used	Gas analyzers EX-TEC®SR5 (EX-TEC®HS680 or Variotec 8-EX)
Value of data applied (for ex ante calculations/determinations)	-
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Methodology AM0023 version 4.0
QA/QC procedures (to be) applied	Equipment is calibrated and verified according to the quality management procedures. Regular maintenance is carried out according to the technical specifications.
Any comment	Concentration of methane in the tank of leak is the difference between the concentration of methane in a tank at the beginning and in the end of measuring. The concentration is measured by means of gas analyzers EX - TEC®SR5 (EX - TEC® HS680 or Variotec 8-EX).

Data/Parameter	τ_i
Data unit	second
Description	Time during which methane concentration reaches a certain level
Time of determination/monitoring	Periodically
Source of data (to be) used	Stop-watch of «SOS pr-2b-2» type or other tipes,which are consistent with GOST 5072-72[10]
Value of data applied (for ex ante calculations/determinations)	-
Justification of the choice of data or description of measurement methods and	Methodology AM0023 version 4.0

[10] «Mechanical seconds measuring devices»

procedures (to be) applied	
QA/QC procedures (to be) applied	Equipment is calibrated and verified according to the quality management procedures. Regular maintenance is carried out according to the technical specifications.
Any comment	-

Data/Parameter	URi
Data unit	%
Description	The uncertainty range for the measurement method applied to leak *i*
Time of determination/monitoring	Annually
Source of data (to be) used	IPCC
Value of data applied (for ex ante calculations/determinations)	95%
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Methodology of AM0023 version 4.0
QA/QC procedures (to be) applied	The person responsible for monitoring checks the data annually
Any comment	The parameter is estimated where possible, at a 95% confidence interval, consulting the guidance provided in chapter 6 of IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories, 2000. If the producer of leak measuring equipment report an uncertainty range without specifying a confidence interval, a confidence interval of 95% may be assumed

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

1. Approach to demonstration of the fact that the Project generates reduction of emissions by sources which are additional to those that would have occurred in the absence of the JI project

Methodology AM0023 version 4.0, and the latest version of the "Tool for the demonstration and assessment of additionality" ver. 06.0.0[11], approved by the CDM Executive Board, were used to justify the additionality of this Project.

This approach can be applied to this Project on methane leak reduction, because it was developed exactly for the projects of such type. The consideration of local terms and legislation will allow estimating its additionality objectively.

[11] "Tool for the demonstration and assessment of additionality" (Version 06.0.0): http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v6.0.0.pdf

2. Application of the selected approach. Proofs of the Project additionality

Step 1 - Identification of alternatives to the Project implementation consistent with current Ukrainian laws and regulations.

Sub-Step 1b: Identification of alternatives to the Project implementation:

Only two baseline alternatives can be considered as acceptable for the Project:

Alternative 1: The continuation of the current situation;

Alternative 2: Measures planned under the Project will be carried out without the use of the mechanism set by article 6 of the Kyoto protocol to the UN Framework Convention on Climate Change.

Alternative 1: Continuation of the current situation of natural gas (and thus methane) leak detection and repair is the most plausible alternative to the Project implementation, because it does not require any additional investment from PJSC "Poltavagaz".

PJSC "Poltavagaz" does not receive any financial profit from methane emission reductions. The existing Ukrainian system of natural gas tariff formation stipulates the lowering of tariff on natural gas in case of reduction of its losses. The payment that is now set for the methane emissions within the fixed limits is difficult to charge because of the absence of measuring technologies and big amount of insignificant emissions spread in large territory.

Alternative 2: According to Methodology AM0023 version 4.0, to determine the probable baseline alternative it is necessary to determine if measures aimed at reduction of methane leaks from equipment have been implemented or are expected to be implemented, by using leak detection and measurement technology similar to the technology described in this methodology.

Before the beginning of the Project implementation PJSC "Poltavagaz" did not carry out any measures aimed at direct inspection and technical maintenance that would go beyond the scope of the requirements set forth by safe practice regulations.

The type and volumes of technological losses in the Ukrainian gas distribution networks were mainly unknown to the moment of the first direct inspections and prophylactic overviews, carried out for the evaluation of possibilities of project implementation within the framework of the mechanisms set by article 6 of the Kyoto protocol to the UN Framework Convention on Climate Change. Estimations of net volume of gas consumption and its losses were approximate, because most end-consumers (60 % of households) have no gas-meters, and the invoicing is executed on the basis of normative standards.

In case of the absence of the support of the Project by the mechanisms set by article 6 of the Kyoto protocol to the UN Framework Convention on Climate Change PJSC "Poltavagaz" had neither incentives nor resources for implementation of the measures planned in the framework of the Project,.
The Project stipulates additional costs on measuring devices, new gas equipment of European producers and their analogues of national production, modern sealing materials and personnel training.

PJSC "Poltavagaz" has no financial incentives to cover such costs on the implementation of the Project measures or measures similar to the project measures, but for possible income, that can be obtained within the framework of the mechanism set by article 6 of the Kyoto protocol to the UN Framework Convention on Climate Change.

Outcome of Step 1a: PJSC "Poltavagaz" is not capable to provide investment for implementation of Alternative 2. Therefore, Alternative 1 is the most plausible scenario.

Sub-Step 1b: Consistency with mandatory Ukrainian laws and regulations

Alternative 1: The current practice of natural gas loss (and accordingly, methane emissions) detection and repair conforms to the current legislation of Ukraine. The legislation admits natural gas losses, and, accordingly, methane emissions in the process of natural gas transportation. The regulations set periodicity of equipment verifications to be carried out by gas distribution organizations with the aim of natural gas loss detection. Practice of natural gas loss detection at PJSC "Poltavagaz" corresponds to the indicated standards. Control over compliance with standards is performed by implementation of annual revisions by authorized bodies.

The Project also conforms to the existing legislative requirements in Ukraine relating to detection of natural gas leaks and methane emissions at gas distribution facilities, and to any other current applicable legislative regulations.

The program of PJSC "Poltavagaz" for regular detection of natural gas leaks will be implemented together with application of more up-to-date methods of detection and measurement of natural gas leaks, and therefore, methane emissions, as well as the activities for long-term natural gas leak, and therefore, methane emission, repair planned under the Project.

Outcome of Sub-Step 1b: The selected plausible, credible and conservative alternative (Alternative 1) fully correspondents to obligatory requirements and standards of the Ukrainian legislation.

Step 2 – Investment Analysis

Since the "Tool for the demonstration and assessment of additionality" version 06.0.0 provides the choice to carry out either investment analysis or barrier analysis, the barrier analysis was chosen to demonstrate additionality.

Step 3 – Barrier Analysis

Sub-step 3a – Identification of barriers that would prevent the implementation of the proposed JI Project activity:

The Project is the first project of such type for PJSC "Poltavagaz", and in this connection a few types of barriers arose at the beginning of the Project implementation. PJSC "Poltavagaz" faced serious financial barriers, and the problem of insufficient experience in the use of new approaches and measuring devices for gas leak detection and repair at its facilities, including:

- Organizational barrier.

Insufficient potential of labor and technical resources of PJSC "Poltavagaz" for implementation and carrying out of purposeful examination and technical maintenance of gas equipment. It is connected with the absence of qualified personnel: the company has faced significant outflow of qualified personnel in the last several years, and newly recruited employees do not have enough experience and knowledge.

- Absence of special technical knowledge.

At the begining of the Project available qualified personnel did not have experience in using gas leak measuring equipment: gas detectors that were used by PJSC "Poltavagaz" provided only for detection of leaks, and the volume of leaks was not measured and fixed. Therefore, the Project implementation requires time to gain practical experience in measurement of natural gas leak volumes.

- Financial barrier.

Additional costs on the Project implementation include the costs on:

- purchase and use of modern measuring devices for methane emission detection and measuring (gas analyzer EX - TEC®SR5, EX - TEC®HS680, or Variotec 8-EX);
- purchase and installation of sealing materials of different types and diameters;
- replacement of old types of GDP (CGDP) gas equipment and shut-off and control valves with new gas equipment of European producers;
- personnel training, realization of direct prophylactic overview and technical maintenance;
- systematic collection of data and data management;
- systematic and long-term control of efficiency of detected natural gas loss repairs.

During the project implementation modern sealing material is used. In accordance with the previous results of research, the sealing materials that comply with GOST 7338-90, GOST 10330-76 and GOST 5152-84 and are far more effective, but at the same time more expensive than sealing materials that are used in the current practice. In the current practice PJSC "Poltavagaz" does not gain any additional benefits in case of reduction of natural gas leaks. Thus, there are no incentives for PJSC "Poltavagaz" to purchase and use more expensive sealing material.

At the beginning of the Project old GDP (CGDP) gas equipment and shut-off and control valves of the USSR production were mostly used at networks of PJSC «Poltavagaz». They are much worse than the new gas equipment and shut-off and control valves of European producers in terms of leak-proofness. But at the same time they are considerably cheaper. Thus, installation of new gas equipment of European producers and their analogues of national production at the gas pipelines could not prevail because of the shortage of funds.

Application of the JI mechanisms to this Project does these measures economically attractive and is the only way of their introduction.

Outcome of Sub-Step 3a: We may conclude, that this Project is economically not attractive without registration of the Project as a JI Project. This proves additionality of this Project.

Sub-step 3b: Demonstrate that the identified barriers would not prevent the implementation of at least one of the alternatives (but for the proposed Project activity):

Financial barriers are also connected with the structure of the existing tariffs for gas transportation and distribution. The tariffs are regulated by the state and do not take into account the depreciation and investment needs of gas distribution enterprises. Such situation results in the constant shortage of money and impossibility of timely implementation of major repairs, ensurance of equipment operation, investing in modernization and development of gas distribution infrastructure.

PJSC "Poltavagaz" will get no direct economic benefits from reduction of methane emissions that will be achieved during the Project implementation but for revenues from the sale of emission reduction units, as lower gas losses will lead to tariff reduction for consumers under the existing tariff system.

Also, it should be taken into account that in Ukraine methane is not included in the list of ecologically harmful gases and methane emissions are not punished by means of ecological fines. Thus, no sanctions are imposed on PJSC "Poltavagaz" in connection with methane leaks at gas pipelines and PJSC "Poltavagaz" gets no financial benefits for reduction of natural gas leaks.

Outcome of Sub-Step 3b*:* As reduction of methane emissions does not bring any economic benefits to PJSC "Poltavagaz"and implementation of this Project does not bring any economic benefits to other Project participants, including the applicant of the Project, but for the benefits within the framework of JI Project, we may conclude that implementation of the Project without the receipt of revenues within the framework of the JI Project, faces the investment barrier.

At the same time, based on the barrier analysis provided above, we may conclude the barriers listed above would not prevent the implementation of only one of two alternatives, namely - Alternative 1: The continuation of the current situation.

Step 4: Common practice analysis
Sub-step 4a: Analysis of other activities similar to the proposed Project activity:

The absence of financial incentives described in Step 2 and barriers described in Step 3 are typical not only for PJSC "Poltavagaz", but also for other companies operating gas distribution networks in Ukraine. Therefore existing practice for detection and repair of methane emissions represented in the baseline scenario selected for this Project is the common one for Ukraine.

In general, the gas distribution companies in Ukraine use the same methods of natural gas leak detection as the ones used at gas pipelines of PJSC "Poltavagaz" before the beginning of the Project. Sealing materials that are used for reduction of losses are also very similar in the regions of Ukraine. The gas distribution enterprises of Ukraine in most cases do not have equipment for measuring of natural gas leak volumes. Programs of natural gas leak detection and repair that are used in Ukraine, in most cases are aimed at meeting safety requirements and prevention of accidents.

Sub-step 4b: Discussion of any similar Options that are occurring:

But for this Project and other projects, implemented within the framework of the mechanism set by article 6 of the Kyoto protocol to the UNFCCC (United Nations Framework Convention on Climate Change), no programs of direct detection and repair of natural gas losses at gas distribution networks are implemented in Ukraine. The Project provides for the use of modern technologies and equipment for natural gas leak detection and measuring.

The prospects of obtaining financing of the Project within the framework of the mechanism set by article 6 of the Kyoto protocol to the UNFCCC allowed its developer to prepare this Project. Thus, it can be concluded that any actions, similar to those which are planned under this Project, are developed and implemented in Ukraine, expecting the receipt of benefits in accordance with the mechanisms set by article 6 of the Kyoto protocol to the UNFCCC.

Outcome: Measures similar to the project measures, can be currently implemented only on condition of receipt of expected revenue from realization of the mechanism set by article 6 of the Kyoto protocol to the UNFCCC. Thus, this Project is considered to satisfy the criteria of additionality.

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

PJSC «Poltavagaz» is the legal user of all gas supply facilities included in the JI project boundary on the basis of Agreements on the use of state property that is not subject to privatization № 04/01-844 as of 28/12/2001 and №14/1077/08 as of 31/12/2008.

There are three types of methane emission sources in the JI Project:
(i) Under the control of the project participants, such as: technological methane leaks during scheduled repair of gas pipelines;

(ii) Reasonably attributable to the project, such as: methane leaks at gas fittings of house distribution networks;
(iii) Significant leaks:
- Leaks at gas equipment (reducers, valves, filters, etc.) of gas distribution points (cabinet-type gas distribution points);
- methane leaks in gas armature (faucets, valves, etc.), threaded and flanged joints, located in gas distribution networks of PJSC "Poltavagaz".

Only methane leaks of type (iii) are included in the JI Project boundary:
- Leaks at gas equipment (reducers, valves, filters, etc.) of gas distribution points (cabinet-type gas distribution points);
- methane leaks in gas armature (faucets, valves, etc.), threaded and flanged joints, located in gas distribution networks of PJSC "Poltavagaz".

Complete list of gas distribution points (642 units), cabinet-type gas distribution points (1852 units) and gas fittings (5047 units), that are including into the JI Project boundary, are provided in the Supporting document 1.

Sources of leaks of type (i) - technological methane leaks during scheduled repair of gas pipelines - are not included in the project boundary as PJSC "Poltavagaz" does not apply the technologies which allow avoiding such leaks.
Sources of leaks of type (ii) - methane leaks at gas fittings of house distribution networks - are not included in the JI Project boundary because, volumes of such leaks are much lower, than volumes of leaks of type (iii), and sources of these leaks, as a rule, are in private houses (apartments).

The JI Project boundary for the baseline and project scenarios is outlined by the dotted line in Figure 4.

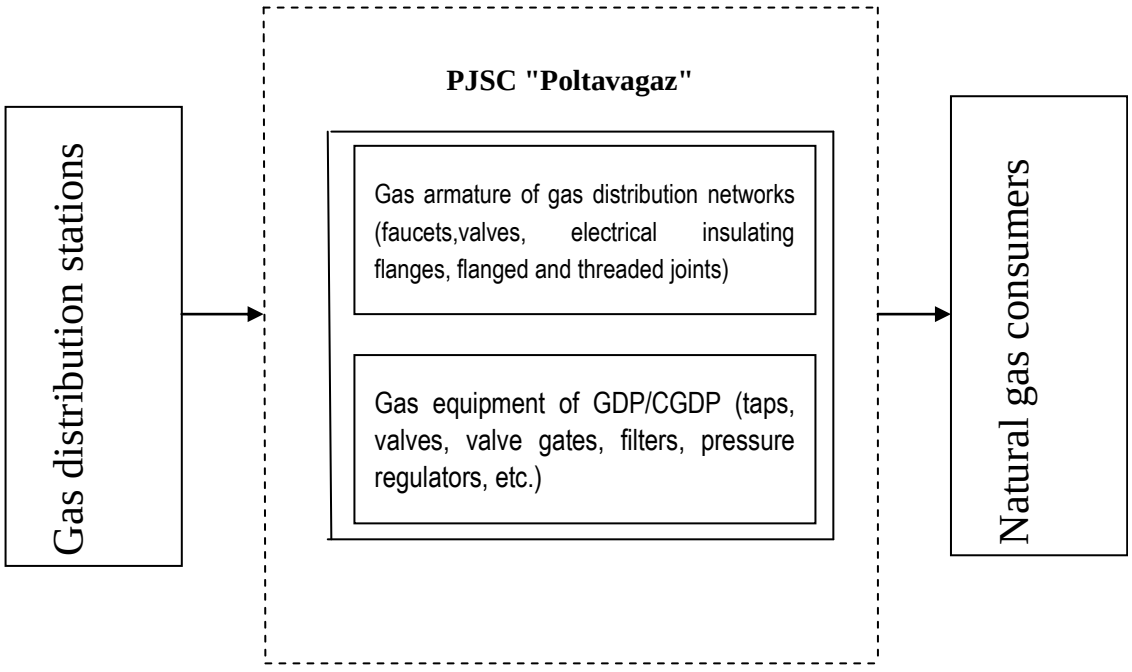

Figure 4. Project boundary

Geographically GDPs (CGDPs) and gas pipelines of PJSC «Poltavagaz» are located in Poltava city, urban villages and villages of Poltavskyi, Reshetylivskyi, Velyko-Bohachivskyi, Hlobinskyi, Dykanskyi, Zenkovskyi, Karlivskyi, Kobylyatskyi, Lokhvytskyi, Mashevskyi, Mirhorodskyi, Novo-Sanzharskyi, Chutovskyi districts of Poltava region, Ukraine.

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: 17/02/2005
Baseline was determined by Moston Properties Limited (the Great Britain) and PJSC "Poltavagaz" (Ukraine)
Moston Properties Limited is not the participant of the Project
Moston Properties Limited
Address: Suite 600, MWB Business Exchange, 10 Greycoat Place, London, SW1P 1SB
United Kingdom
Telephone: 42079001995
Fax: 42079001995
Contact person: Michael Mokhov

PJSC "Poltavagaz" is the Project participant.
PJSC "Poltavagaz"
Address: Ukraine, Poltava region, Poltava, Kozaka str., 2a.
Telephone: +38 (05322) 73 075
Fax: +38 (05322) 73 075
E-mail: sekretar@pgaz01.poltava.ukrtel.net
www: http://77.121.11.33
Contact person: Rostyslav Grynchak

SECTION C. Duration of the project / crediting period

C.1. Starting date of the project:

Starting date of the Project: 04/02/2005 – the date of signing of the Memorandum of Understanding relating to the JI Project between Moston Properties Limited and PJSC "Poltavagaz".

C.2. Expected operational lifetime of the project:

Functioning of the system of leak detection and repair, and also further maintaining of leakage-proofness of gas equipment that was created within the framework of the Project, are not limited in time, as periodic repair (replacement) of GDP (CGDP) gas equipment and gas fittings, threaded and flanged connections of gas pipelines will be performed constantly.
Expected operational lifetime of the Project in years and months is 12 years and 11 months, or 155 months, from 04/02/2005 to 31/12/2017.

C.3. Length of the crediting period:

The JI Project refers to the first commitment period and makes 5 years/60 months (January 1, 2008 – December 31, 2012).

The starting date of the crediting period is the date when the first project measures at gas pipelines of PJSC "Poltavagaz" were carried out, namely February 17, 2005. The end of the crediting period is December 31, 2012. The crediting period lasts for 7 years and 11 months or 95 months.

If after the first commitment period according to the Kyoto Protocol it will be prolonged, the crediting period of the Project will be prolonged till December 31, 2017. The prolongation of the crediting periof after 2012 is subject to the Host party's approval. The total crediting period (before the crediting period, the crediting period and after the crediting period) will last for 12years and 11 months or 155 months.

SECTION D. Monitoring plan

D.1. Description of monitoring plan chosen:

With the aim of quantitative estimation and preparation of reports on reduction of methane emissions on the basis of the baseline and the project activity the JI specific approach with the use of approved CDM methodology AM0023 "Leak detection and repair in gas production, processing, transmission, storage and distribution systems and in refinery facilities", Version 4.0 was applied. The modification of methodology AM0023 version 4.0 (refer to Section B.1. above) was caused by application of more accurate method of methane leak measurements.

After the detection and measurement of methane leaks a monitoring programme was developed for all gas equipment of GDPs (CGDPs), shut-off and control valves, flanged and threaded joints of PJSC "Poltavagaz" gas pipelines. Implementation of the programme is a part of the JI project activity. The monitoring covers emissions from newly detected sources of leaks and control of already repaired equipment where gas leaks have been detected before.

Under the JI project the Working Team of PJSC "Poltavagaz" drew up a Registry of gas distribution points and gas fittings of the JI project "Reduction of methane emissions on the gas equipment of gas distribution points, gas armature, flanged and threaded joints of gas distribution networks of PJSC "Poltavagaz" (see Supporting Document 1), which includes full information about all GDPs (CGDPs), shut-off and control valves, flanged and threaded joints included into the Project boundary.

All relevant data associated with calculation of methane emission reductions are stored in an electronic database. Each Monitoring Report will contain all necessary information from this database.

Project data and documents in paper and/or electronic form shall be stored till 31/12/2019 pursuant to Orders No. 29/1 dated 07/02/2005 and No. 352 dated 10/11/2011 issued by the management board of PJSC "Poltavagaz".

To determine the baseline the following parameters are used:

Table 4. Parameters used for baseline setting

№	Parameter reference	Name to the parameter	Data unit
1.	i	Sequence number of GDP (CGDP) gas equipment, gas fittings of gas pipeline where methane leak is detected	Dimensionless
2.	Ti	Time (hours) when relevant unit of equipment where methane leak was detected was in operation during a year	Hour
3.	Date	Date of repair (reconstruction)	Month and year
4.	GWP_{CH4}	Global Warming Potential for methane	tCO_2e/tCH_4
5.	$F_{CH4,i}$	Methane leak rate for each detected leak	m^3CH_4/hour
6	t	Gas temperature	^0C
7	P	Gas pressure	MPa
8.	URi	The uncertainty range for the measurement method applied to leak *i*	%
9.	*Vbag*	Tank capacity	m^3
10.	$w_{sampleCH4,i}$	Methane concentration in a tank	%
11.	τ_i	Time during which methane concentration reaches a certain level	second

Types of the data and the parameters used during annual monitoring measurements of methane leak volumes:

Ty-pe	Properties	Parameter № in the Table 4 of the PDD	Designation	Name to the parameter	Data measuring units
(i)	Data and parameters that are not monitored throughout the crediting period, but are determined only once , and that are available already at the stage of the PDD development	1	i	Sequence number of GDP (CGDP) gas equipment, gas fittings of gas pipeline where methane leak is detected	Dimensionless
		9	V_{bag}	Tank capacity	m^3
(ii)	Data and parameters that are not monitored throughout the crediting period, but are determined only once (and thus remain fixed throughout the crediting period), but that are not already available at the stage of PDD development	-	-	-	-
(iii)	Data and parameters that are monitored throughout the crediting period	2	Ti	Time (hours) when relevant unit of equipment where methane leak was detected was in operation during a year	Hour
		3.	Date	Date of repair (reconstruction)	Month and year

		4.	GWP_{CH4}	Global Warming Potential for methane	tCO_2e/tCH_4
		5.	$F_{CH4,i}$	Methane leak rate for each detected leak	m^3CH_4/hour
		6.	t	Gas temperature	^0C
		7.	P	Gas pressure	MPa
		8.	URi	The uncertainty range for the measurement method applied to leak *i*	%
		10.	$w_{sampleCH4,i}$	Methane concentration in a tank	%
		11.	τ_i	Time when methane concentration reaches a certain level	second

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

At the beginning of the project there was no single methodology for measuring and monitoring of methane leaks in Ukraine. In this connection PJSC "Poltavagaz" and Moston Properties Limited concluded the Memorandum of Understanding relating to the JI Project on 04/02/2005. In accordance with this document Moston Properties Limited assumed an obligation to work out the Plan and program of methane leak monitoring. The monitoring plan was worked out on the basis of methodology AM0023 version 4.0 with some assumptions in relation to the method of measuring of methane leak volumes described in section B.1 above. The monitoring methodology is described in detail in Annex 3.

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) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/paper)	Comment
1. i	Sequence number of GDP (CGDP) gas equipment, gas fittings of gas pipeline where methane leak is detected , repaired and then checked	Activity on leak measurements	Dimensionless	m	Once	100%	Electronic	Each leak detected is tagged with a corresponding number. A list of gas equipment is provided in Supporting document 1. Verification is conducted after repair.
2. Ti	Time (hours) when relevant unit of equipment where methane leak was detected was in operation during a year	Records of inspection results	hour	m	Constantly	100%	Electronic	Time (hours) of equipment operation during a year from the moment of its repair (replacements)
3. Date	Date	Data of repair (reconstructions) and monitoring (registry)	Date of repairs (reconstruction) and monitoring	m	Constantly	100%	Electronic	Month, when equipment was repaired (replaced). It is used to determine the total number of hours of operation of repaired (replaced) equipment in the monitoring period.

ID number *(Please, use numbers to ease cross-referencing to D.2.)*	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/paper)	Comment
4. GWP_{CH4}	Global Warming Potential for methane	IPCC	tCO_2e / tCH_4	c	Constantly	100%	Electronic	The Project developer will monitor any changes in the Global Warming Potential for methane, published by IPCC and agreed upon by the COP
5. $F_{CH4,i}$	Methane leak rate for each detected leak	Activity on leak measurements	m^3 CH_4/hour.	c	Before repair and after repair/Annually	100%	Electronic	The parameter is calculated with application of the maximum value of device error (10% for gas analyzer)
6. t	Gas temperature	Data of measuring by the mercury-in-glass thermometer of TL-4 type	^0C	m	Each time when measurements are carried out	100%	Electronic	The parameter is measured to determine of CH_4 density
7. P	Gas pressure	Data of measurements by the barometer-aneroid BAMM-1 or B-67	MPa	m	Each time when measurements are carried out	100%	Electronic	The parameter is measured to determine of CH_4 density

ID number *(Please, use numbers to ease cross-referencing to D.2.)*	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/paper)	Comment
8. URi	The uncertainty range for the measurement method applied to leak *i*	Information of producers and/or IPCC GPG	%	m or e	Annually	100%	Electronic	The parameter is estimated where possible, at a 95% confidence interval, consulting the guidance provided in chapter 6 of IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories, 2000. If the producer of leak measuring equipment report an uncertainty range without specifying a confidence interval, a confidence interval of 95% may be assumed
9. *Vbag*	Tank capacity	Data of flow meter measurements	m^3	m	Once	100%	Electronic / paper	Tank is filled with water. Amount of water measured by flow meter will make tank capacity Measurement showed that tank capacity is 0.11 m^3.

ID number *(Please, use numbers to ease cross-referencing to D.2.)*	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/paper)	Comment
10. $w_{sampleCH4,i}$	Methane concentration in a tank	Data of gas analyzer EX - TEC® SR5 or EX - TEC® HS 680 or Variotec 8-EX measurements	%	m	Each time when measurements are carried out	100%	Electronic	Concentration of methane in the tank of leak is the difference between the concentration of methane in a tank at the beginning and in the end of measuring. The concentration is measured by means of gas analyzers EX - TEC®SR5 (EX - TEC® HS680 or Variotec 8-EX).
11. τ_i	Time during which methane concentration reaches a certain level	Data of stop-watch "SOS pr-2b-2" measurements	Seconds	m	Each time when measurements are carried out	100%	Electronic	Time during which the concentration of methane in a tank reaches a certain level is determined by means of stop-watch. Measuring begins from the moment of opening of faucet on a lid of the tank and is finished at the achievement of concentration of methane of certain level in the capacity.

According to the current legislation, all measuring equipment in Ukraine must satisfy the set requirements and corresponding standards and undergo periodic verification.

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

When using the leak-proof bag method of leak measurement, the project methane leak volumes after the repair (replacement) can be calculated in accordance with the following formula:

$F^{+}_{CH4,i} = Vbag * w_{sampleCH4,i} * 3600 / \tau_i$, where (1)

$F^{+}_{CH4,i}$ – project methane leak rate (volume) through leaky piece of equipment *i* after the repair (replacement), m³/h;
Vbag - volume of a leak-proof bag for measurement, m³;
$w_{sampleCH4,i}$ - methane concentration in a leak sample *i* that is the difference of concentrations at the beginning and at the end of measurement, %;
τ_i – time for bag filling for leak *i* up to the certain concentration, seconds.

Adjustment of methane leak rate (volume) to standard conditions:
Methane leak rate (volume) obtained as a result of measurements is adjusted to standard conditions ($P_н$ = 0,1013 MPa, $T_н$ = 273 K) in accordance with the following formula:

$$F_{CH_4,i,P} = \frac{F^{+}_{CH_4,i} \cdot 273 \cdot P}{0{,}1013 \cdot (273+t)}$$, where (2)

$F_{CH_4,i,P}$ – project methane leak rate (volume) (after the repair, replacement) for piece of equipment *i*, adjusted to standard conditions, m³/h;
$F^{+}_{CH4,i}$ - methane leak rate (volume) through leaky piece of equipment *i* after the repair (replacement), m³/h;
P – gas pressure in the tank, MPa;
t – gas temperature in the tank, °C.

Annual project methane leaks (after the repair, replacement) are calculated in accordance with the following formula:

Q_{yP}= ConvFactor *Σ[$F_{CH_4,i,P}$ *Ti,y * URi]*GWP_{CH4}*0.9, where (3)

Q_{yP} - methane emissions in period *y* for equipment that was repaired (replaced), t CO_2e;
ConvFactor - m³ CH_4 to t CH_4 conversion factor under standard conditions (0 °C and 101.3 kPa). It equals to 0.0007168 t CH_4/m³ CH_4;
$F_{CH_4,i,P}$ – rate (volume) of project methane leak for piece of equipment *i*, adjusted to standard conditions (after the repair, replacement), m³/h;
URi - the uncertainty range for the measurement method applied to leak i, % (equals to 95%);
Ti,y - time (in hours) for piece of equipment *i* that operated during the period (monitoring period) *y* after the repair (replacement);

GWP_{CH4} - Global Warming Potential for methane (equals to 21 t CO_2e/t CH_4);
0.9 - factor that accounts for inaccuracy of metering device.

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) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/paper)	Comment
1. i	Sequence number of GDP (CGDP) gas equipment, gas fittings of gas pipeline where methane leak is detected , repaired and then checked	Activity on leak measurements	Dimensionless	m	Once	100%	Electronic	Each leak detected is tagged with a corresponding number. A list of gas equipment is provided in Supporting document 1. Verification is conducted before repair.
2. Ti	Time (hours) when relevant unit of equipment where methane leak was detected was in operation during a year	Records of inspection results	hour	m	Constantly	100%	Electronic	Time (hours) of equipment operation during a year before the moment of its repair (replacements)

ID number *(Please, use numbers to ease cross-referencing to D.2.)*	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/paper)	Comment
3. Date	Date	Data of repair (reconstructions) and monitoring	Date of repairs (reconstruction) and monitoring	m	Constantly	100%	Electronic	Month, when equipment was repaired (replaced). It is used to determine the total number of hours of operation of repaired (replaced) equipment in the monitoring period.
4. GWP_{CH4}	Global Warming Potential for methane	IPCC	tCO_2e / tCH_4	c	Constantly	100%	Electronic	The Project developer will perform monitoring of any changes in the Global Warming Potential for methane, published by IPCC and agreed upon by the COP
5. $F_{CH4,i}$	Methane leak rate for each detected leak	Activity on leak measurements	m^3 CH_4/hour.	c	Annually	100%	Electronic	The parameter is calculated with application of the maximum value of device error (10% for gas analyzer)
6. t	Gas temperature	Data of measuring by the mercury-in-glass thermometer of TL-4 type	^0C	m	Each time when measurements are carried out	100%	Electronic	The parameter is measured to determine of CH_4 density

ID number *(Please, use numbers to ease cross-referencing to D.2.)*	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/paper)	Comment
7. P	Gas pressure	Data of measurements by the barometer-aneroid BAMM-1 or B-67	MPa	m	Each time when measurements are carried out	100%	Electronic	The parameter is measured to determine of CH_4 density
8. URi	The uncertainty range for the measurement method applied to leak *i*	Information of producers and/or IPCC GPG	%	m or e	Annually	100%	Electronic	The parameter is estimated where possible, at a 95% confidence interval, consulting the guidance provided in chapter 6 of IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories, 2000. If the producer of leak measuring equipment report an uncertainty range without specifying a confidence interval, a confidence interval of 95% may be assumed
9. *Vbag*	Tank capacity	Data of flow meter measurements	m^3	m	Once	100%	Electronic / paper	Tank is filled with water. Amount of water measured by flow meter will make tank capacity Measurement showed that tank capacity is 0.11 m^3.

ID number *(Please, use numbers to ease cross-referencing to D.2.)*	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/paper)	Comment
10. $w_{sampleCH4,i}$	Methane concentration in a tank	Data of gas analyzer EX - TEC® SR5 or EX - TEC® HS 680 or Variotec 8-EX measurements	%	m	Each time when measurements are carried out	100%	Electronic	Concentration of methane in sample (the tank) of leak is the difference between the concentration of methane in a tank at the beginning and in the end of measuring. The concentration is measured by means of gas analyzers EX - TEC®SR5 (EX - TEC® HS680 or Variotec 8-EX).
11. τ_i	Time during which methane concentration reaches a certain level	Data of stop-watch "SOS pr-2b-2" measurements	Seconds	m	Each time when measurements are carried out	100%	Electronic	Time during which the concentration of methane in a tank reaches a certain level is determined by means of stop-watch. Measuring begins from the moment of opening of faucet on a lid of the tank and is finished at the achievement of concentration of methane of certain level in the capacity.

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

When using the leak-proof bag method of leak measurement, baseline methane leak volumes from one unit of equipment can be calculated in accordance with the following formula:

$\bar{F}_{CH_{4,i}}$ = Vbag * $w_{sampleCH4,i}$ * 3600 / τ_i, where (4)

$\bar{F}_{CH_{4,i}}$ - baseline methane leak rate (volume) through leaky piece of equipment *i* before the repair (replacement), m³/h;

Vbag - volume of a leak-proof bag for measurement, m³;

$w_{sampleCH4,i}$ - methane concentration in a leak sample that is the difference of concentrations at the beginning and at the end of measurement, %;

τ_i - average time for bag filling for leak *i* before its repair (replacement), seconds.

Methane leak rate (volume) obtained as a result of measurements is adjusted to standard conditions ($P_н$ = 0,1013 MPa, $T_н$ = 273 K) in accordance with the following formula:

$$F_{CH_{4,i,B}} = \frac{\bar{F}_{CH_{4,i}} \cdot 273 \cdot P}{0{,}1013 \cdot (273 + t)}, \text{ where} \quad (5)$$

$F_{CH_{4,i,B}}$ – baseline methane leak rate (volume) for element *i*, adjusted to standard conditions (before the repair, replacement), m^3/h;

$\bar{F}_{CH_{4,i}}$ – methane leak rate (volume) through leaky piece of equipment *i* before the repair (replacement), m³/h;

P – gas pressure in the tank, MPa;

t – gas temperature in the tank, °C.

Annual baseline methane leaks are calculated in accordance with the following formula:

$$Q_{yB} = ConvFactor * \Sigma[F_{CH_{4,i,B}} * Ti,y * URi] * GWP_{CH4} * 0.9, \text{ where} \quad (6)$$

QyB - baseline methane emissions at gas equipment in the period *y* (before its repair, replacement), tCO_2e;

ConvFactor - m³ CH_4 to t CH_4 conversion factor under standard conditions (0 °C and 101.3 kPa). It equals to 0.0007168 t CH_4/m³ CH_4;

$F_{CH_{4,i,B}}$ – rate (volume) of baseline methane leak for element *i*, adjusted to standard conditions (before the repair, replacement), m^3/h;

URi - The uncertainty range for the measurement method applied to leak *i*, %;

Ti,y - time (in hours) for piece of equipment *i* that operated during the period (monitoring period) *y* before the repair (replacement);

GWP_{CH4} Global Warming Potential for methane (equals to 21 t CO_2e/t CH_4);

0.9 – factor that accounts for inaccuracy of metering device.

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
-	-	-	-	-	-	-	-	-

Direct monitoring of emission reduction is not used.

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):

Direct monitoring of emission reduction is not used.

D.1.3. Determination 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
-	-	-	-	-	-	-	-	-

No leakage is expected.

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

No leakage is expected.

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

The amount of Emission Reduction Units (ERU) and Assigned Amount Units (AAU) in t CO_2e is calculated in accordance with the formula:

$$ERU = \sum[Q_{yB} - Q_{yP}] \quad , \qquad (7)$$

$$AAU = \sum[Q_{yB} - Q_{yP}] \quad , \text{ where} \qquad (8)$$

ERU– Emission Reduction Units, t CO_2e;
AAU - Assigned Amount Units, t CO_2e;
Q_{yP}–Project emissions, t CO_2e;
Q_{yB}–baseline emissions, t CO_2e.

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

Implementation of this Project does not provide for any negative environmental impact (See section F below). Therefore data collection on environmental impacts of the Project is not required. There are no laws or regulations in Ukraine requiring collection of such information.

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.
1.	Low	Each leak must be tagged with a number and monitored after repair for any additional leaks
2.	Low	Data loggers will be installed wherever possible for machines that turn off frequently, with the aim of measuring of time when equipment is in operation
3.	Low	Work orders, instructions and other records must be kept in addition to repair logs
4.	Low	Project participants will keep track of any new values for greenhouse gases adopted by the COP
5.	Low	Leak rates will be measured and double checked before repair-major discrepancies will warrant a third test. In other words, if a gas analyzer is used to measure the rate of a leak, if the results of two tests are far apart, the testing should continue until two measurements have results very close together (to reduce any inaccuracies in the testing process). If a gas analyzer or other equipment need recalibration or adjustment to ensure their accuracy, the project participants will take the necessary action to do so.
6.	Low	The records of data about equipment that is calibrated and checked on a regular basis.
7.	Low	The records of data about equipment that is calibrated and checked on a regular basis.
8.	Med/Low	The IPCC GPG will be consulted in compiling uncertainty estimate
9.	Low	Volume of a leak-proof tank does not change in course of time, therefore constatnt verification of its volume is not obligatory.
10.	Low	Gas analyzers EX - TEC® SR5, EX - TEC®HS680, or Variotec8-EX comply with the requirements of the European standard EN50054/57 and undergo annual calibration/verification.

11.	Low	A stop-watch is a simple device and it is not included in the list of devices that must under go annual calibration. A stop-watch of "SOS pr-2b-2" type or other type, which corresponds to GOST 5072-72 will be used.

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

Coordination of activities of all departments and services of PJSC "Poltavagaz" relating to the JI project implementation is done by the Working Team created pursuant to Order No.29/1 of PJSC "Poltavagaz" management board as of 07/02/2005. The new line-up of the Working Team is approved by Order No. 352 of the Chairman of PJSC "Poltavagaz" Board dated 10/11/2011. The structure of the Working Team is shown in Figure 5.

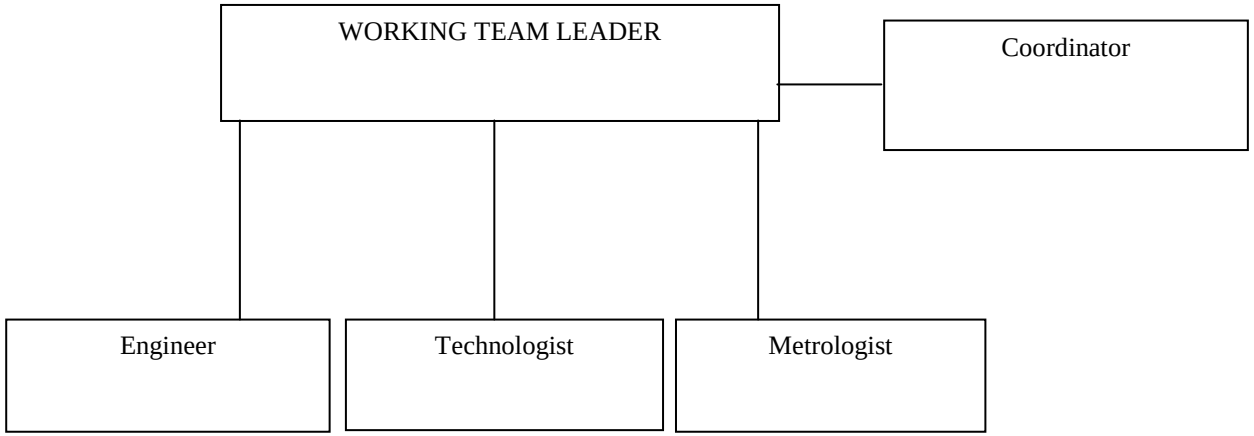

Figure 5. Structure of the Working team

The technologist of PJSC "Poltavagaz" is responsible for collection of all information under the monitoring plan and conduction of all necessary calculations. The engineer is responsible for organization of monitoring measurements of leaks and their repair. On the basis of the information received, Head of the Working Team shall determine the plan of project activities and the amount of resources required. The metrologist shall ensure the availability of verified metering devices and technical support. The coordinator is responsible for storage, archiving and backuping of project information.

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

Company CEP Carbon Emissions Partners S.A.
Address: 52 Route of de of Thonon, Geneva, CH-1222, Switzerland
Telephone: +41 (76) 346 11 57
Fax: +41 (76) 346 11 57
E-mail: 0709bp@gmail.com
web Page: -
Contact person: Fabian Knodel

CEP Carbon Emissions Partners S.A. is the project participant.

PJSC «Poltavagaz»
Address: V.Kozaka str., 2a, Poltava, Polava region, Ukraine.
Telephone: +38 (05322) 73 075
Fax: +38 (05322) 73 075
E-mail: sekretar@pgaz01.poltava.ukrtel.net
Веб-сторінка: http://77.121.11.33/
Contact person: Rostyslav Grunchak

PJSC “Poltavagaz” is the Project participant.

SECTION E. Estimation of greenhouse gas emission reductions

E.1. Estimated project emissions:

The estimation of project emissions was performed on the basis of the data received according to the monitoring plan presented in Section D.1.1.2 and Annex 3. The results of measurements and calculations done by CEP Carbon Emissions Partners S.A. (see Supporting document 2)[12] are provided in Table 5.

Table 5. Estimated Project Emissions

Year	Estimated project emissions (tons CO_2 equivalent)
2005	27 306
2006	95 571
2007	163 836
Total 2005 - 2007	**286 713**
2008	197 968
2009	204 795
2010	204 795
2011	204 795
2012	204 795
Total 2008 - 2012	**1 017 148**
2013	204 795
2014	204 795
2015	204 795
2016	204 795
2017	204 795
Total 2013 - 2017	**1 023 975**
Total (tons of CO_2 equivalent)	**2 327 836**

E.2. Estimated leakage:

No leakage is expected.

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

As there is no leakage, the sum of E.1. and E.2. will be equal to E.1. (see Table 5)

E.4. Estimated baseline emissions:

Baseline emissions provided in the Table 6 were estimated by using the formulae provided in Section D.1.1.4.

[12] Supporting document 2 – "Calculation of methane emission reductions on gas equipment of GDPs (CGDPs), gas fittings, flanged and threaded connections of gas distribution networks of PJSC "Poltavagaz" on the basis of initial monitoring measurements", is executed in an electronic form and submitted to the State Environmental Investment Agency of Ukraine and BureauVeritas Certification Holding SAS – the company that verifies the project.

Table6. Estimated baseline emissions

Year	Estimated baseline emissions (tons of CO_2 equivalent)
2005	150 653
2006	527 284
2007	903 916
Total 2005 - 2007	**1 581 853**
2008	1 092 231
2009	1 129 895
2010	1 129 895
2011	1 129 895
2012	1 129 895
Total 2008 - 2012	**5 611 811**
2013	1 129 895
2014	1 129 895
2015	1 129 895
2016	1 129 895
2017	1 129 895
Total 2013 - 2017	**5 649 475**
Total (tons of CO_2 equivalent)	**12 843139**

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

Estimated annual reduction of greenhouse gas emissions in the project is calculated according to the formula:

Estimated emission reductions of the project = Estimated baseline emissions – (Estimated project emissions + Estimated leakage) (8)

All results of estimation of emission reductions in the project are provided in the Table 7 below.

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

Table 7. Estimated emission reductions under the Project

Year	Estimated baseline emissions (tons of CO_2 equivalent)	Estimated leakage (tones of CO_2 equivalent)	Estimated project emissions (tons of CO_2 equivalent)	Estimated emission reductions (tons of CO_2 equivalent)
2005	150 653	0	27 306	123 347
2006	527 284	0	95 571	431 713
2007	903 916	0	163 836	740 080
Total 2006 - 2007	**1 581 853**	**0**	**286 713**	**1 295 140**
2008	1 092 231	0	197 968	894 263
2009	1 129 895	0	204 795	925 100
2010	1 129 895	0	204 795	925 100
2011	1 129 895	0	204 795	925 100
2012	1 129 895	0	204 795	925 100
Total 2008 - 2012	**5 611 811**	**0**	**1 017 148**	**4 594 663**
2013	1 129 895	0	204 795	925 100
2014	1 129 895	0	204 795	925 100
2015	1 129 895	0	204 795	925 100
2016	1 129 895	0	204 795	925 100
2017	1 129 895	0	204 795	925 100
Total 2013 – 2017	**5 649 475**	**0**	**1 023 975**	**4 625 500**
Total (tons of CO_2 equivalent)	**12 843 139**	**0**	**2 327 836**	**10 515 303**

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:

According to the environmental standards of Ukraine, natural gas emissions into the air are not considered polluting. (The Decree of the Cabinet of Ministers of Ukraine №1598 dated 29/2001 "About approval of the list of the most widespread and dangerous polluting substances which emissions are subject to regulation"). Therefore no environmental permissions are required for natural gas transportation and supply. The only environmental impact is reduction of natural gas emissions into the atmosphere.
Implementation of this project will increase the safety of operation of gas distribution networks, which, in turn, will reduce the probability of explosions or fires.

No transboundary impacts from the project activity, according to their definition in the text of the "Convention on long-range tansboundary pollution" ratified by Ukraine, will take place.

The Project implementation does not provide for any harmful impacts on the environment.

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 Project implementation does not provide for any harmful impacts on the environment.

SECTION G. Stakeholders' comments

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

Consultations were conducted with the specialists of the Institute of General Energy of NAS of Ukraine. No comments from Stakeholders were received. The project activity provides for neither negative impact on the environment nor negative social effect.

Annex1

CONTACT INFORMATION ON PROJECT PARTICIPANTS

Organisation:	PJSC «Poltavagaz»
Street/P.O.Box:	Kozaka str.
Building:	2a
City:	Poltava
State/Region:	Poltava Region
Postal code:	36039
Country:	Ukraine
Phone:	+38(05322) 73-075
Fax:	-
E-mail:	sekretar@pgaz01.poltava.ukrtel.net
URL:	-
Represented by:	-
Title:	The Head of the Board
Salutation:	-
Last name:	Grynchak
Middle name:	Ivanovych
First name:	Rostyslav
Department:	-
Phone (direct):	-
Fax (direct):	-
Mobile:	-
Personal e-mail:	sekretar@pgaz01.poltava.ukrtel.net

Organisation:	CEP Carbon Emissions Partners S.A.
Street/P.O.Box:	Route de Thonon
Building:	52
City:	Geneva
State/Region:	-
Postal code:	Case postale 170 CH-1222 Vésenaz
Country:	Switzerland
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URL:	
Represented by:	Director
Title:	Mister
Salutation:	-
Last name:	Knodel-
Middle name:	-
First name:	Fabian
Department:	-
Phone (direct):	-
Fax (direct):	-
Mobile:	
Personal e-mail:	

Annex 2

BASELINE INFORMATION

To determine the baseline the following parameters are used:

№	Parameter reference	Name to the parameter	Data unit
1.	i	Sequence number of GDP (CGDP) gas equipment, gas fittings of gas pipeline where methane leak is detected	Dimensionless
2.	Ti	Time (hours) when relevant unit of equipment where methane leak was detected was in operation during a year	Hour
3.	Date	Date of repair (reconstruction)	Month and year
4.	GWP_{CH4}	Global Warming Potential for methane	tCO_2e/tCH_4
5.	$F_{CH4,i}$	Methane leak rate for each detected leak	m^3CH_4/hour
6	t	Gas temperature	^0C
7	P	Gas pressure	MPa
8.	URi	The uncertainty range for the measurement method applied to leak *i*	%
9.	*Vbag*	Tank capacity	m^3
10.	$w_{sampleCH4,i}$	Methane concentration in a tank	%
11.	τ_i	Time during which methane concentration reaches a certain level	second

The detailed description of parameters for determination of the baseline is presented in tables of section B.1.

Calculation of the baseline is performed as per formulae (4), (5) and (6) (Section of D.1.1.4).

Annex 3

MONITORING PLAN

The monitoring plan includes the following components:

1. The program of the initial monitoring measurements of methane leaks at the gas equipment of GDPs (CGDPs), gas fittings, threaded and flanged connections of PJSC "Poltavagaz" gas distribution networks.
2. Monitoring map of methane leaks at the gas equipment of GDPs (CGDPs), gas fittings, threaded and flanged connections of PJSC "Poltavagaz" gas distribution networks.
3. Methodology of methane leak measurements.
4. Guidance on monitoring measurement data collection and storage.

I. PROGRAM

of the initial monitoring measurements of methane leaks at the gas equipment of GDPs (CGDPs), gas fittings, threaded and flanged connections of PJSC "Poltavagaz" gas distribution networks.

The aim of the initial monitoring measurements of methane leaks is:

1. Receipt of a more reliable estimation of methane leak volumes from the gas transportation system (exept for the leaks, related to operation, technical maintenance or emergency situations).
2. ERUs estimate during the JI Project implementation.
3. Determination of the potential income of the project and amount of repair work which is necessary under condition of an attractive payback period for investment.
4. Determination of priorities in relation to works that must be executed at gas equipment.
5. Obtaining of initial experience in the use of measuring equipment, identification of questions, that must be solved or improved (such as additional measuring equipment, accuracy class of devices, necessity of training of corresponding workers) before the beginning of the project, to provide for the proper implementation.

The JI Project has the following stages:

- determination of the list of facilities where methane leaks occur;
- measuring of methane leak volumes;
- repair of methane leaks by repair of gas equipment or replacement of sealing materials, or complete replacement of equipment;
- monitoring of leaks at equipment that was already repaired (replaced).

At the primary stages the most essential issue is the receipt of model of methane leaks at GDP (CGDP) gas equipment and gas fittings of the gas distribution pipelines. If realization of complete inspection of all elements on every GDP (CGDP) will appear inappropriate, then it is necessary to choose the most typical and characteristic elements. For example, the workers of the stations must have a justified idea about equipment which will be the best for relevant facilities and about terms the verification of equipment and facilities. Certain issues have to be determined systematically during preliminary measuring:

- where leaks take place and what are their size parameters;
- where leaks are relatively small;
- where there are possibilities for repair or/and replacements of equipment, that require small funds;
- where significant leaks are detected and their repair will not demand significant financing.

Quality information (for example, difficulties in measuring at certain valves because of the limited access to them etc) also must be recorded, where possible to facilitate planning and implementation of the Project.

The system of the name/ numeration of gas equipment must be agreed upon before the beginning of measuring.

Tables, stated below must contain explanatory and actual information, not directing and normative character.

Table 1MP. Information about a facility - (name of GDP or CGDP)

A logger of technical verification of gas equipment of GDPs (CGDPs) is maintained (a maintenance logger that is kept by inspectors) - one time per four days, it is performed by the corresponding authorized worker. Leaks are specified in the logger of reports. Gas contamination is determined by the use of gas detector with the aim of meating UGSSR requirements to prevent emergency situations.

Current repair is conducted one time per year, technical maintenance - one time per half-year.

Name of GDP (CGDP) (code according to the Register)	Gas pressure at entrance /exit, (MPa)	Gas temperature at entrance /exit, ^oC	Average volume of the transported gas, m^3/hour.	% CH_4 (methane) in gas
1	2	3	4	5

Table 2MP. Protocol of measuring of methane leaks (name of GDP or CGDP)

Dates of measuerment: _____
Atmospheric pressure during measuerment: _____ (MPa)
Temperature of air during measuerment: _____(0C)
Volume of leak-proof tank: _____ (m^3)

No.	Name of gas equipment	Measurement of the air flow sample		Time of filling the leakage-proof tank, sec	Methane leaks, m^3/hour	Annual GHG leaks, tCO_2/year
		Background concentration, %	Concentration of sample by the end of measuring, %			
1	2	3	4	5	6	7
1	Catch at the entrance to the object					
2	Inlet cock					
3	Three –way cock with manometer					
4	Filter					
5	Bolt bypass					
6	Three –way cock with manometer					
7	Bolt bypass					
8	manometer					
9	PZK					
10	Pressure regulator					
11	Outlet cock					
12	Comb with faucets					
13	PSK					
14	Manometer					
15	Cock at the exit from the					

No.	Name of gas equipment	Measurement of the air flow sample		Time of filling the leakage-proof tank, sec	Methane leaks, m^3/hour	Annual GHG leaks, tCO_2/year
		Background concentration, %	Concentration of sample by the end of measuring, %			
1	2	3	4	5	6	7
	facility					
Second line of reduction						
16	Inlet cock					
17	Three –way cock with manometer					
18	Filter					
19	manometer					
20	PZK					
21	Pressure regulator					
22	Outlet cock					
23	Comb with faucets					
24	PSK					
25	manometer					

Measurement were conducted by: _____
_____
_____

Explanation to Table 2.

(1) Sequence number of equipment as per the register.
(2) Names of equipment.
(3) Background concentration is a concentration of methane in a leak-proof tank before the beginning of measuring (volume percentage).
(4) Concentration of sample is a concentration of methane in a leak-proof tank at the end of measuring (volume percentage).
(5) Time of filling of a leak-proof tank with methane to a set concentration level (seconds).
(6) Methane leaks in m^3 are calculated as per the formula (4) and (5) of this PDD
(7) Annual methane emissions in tCO_2 equivalent are calculated as per the formula (6) of the PDD

Table 3MP. Protocol of measuring of methane leaks at gas fittings

Dates of measuerment: _____
Atmospheric pressure during measuerment: _____ (MPa)
Temperature of air during measuerment: _____(0C)
Volume of leak-proof tank: _____ (m^3)

№	Code as per Register	Address	Measuring of air flow sample		Time of leak-proof tank filling, sec	Methane leaks, m^3/hour.	Annual leaks , t CO_2/year
			Methane background concentration, %	Sample concentration %			
1	2	3	4	5	6	7	8

Measurement were conducted by: _____
_____
_____

Explanation to Table 3MP.

(1) Sequence number of gas fittings.
(2) Codes of gas fittings as per the register.
(3) Addresses of location of gas fittings.
(4) Background concentration is a concentration of methane in a leak-proof tank before the beginning of measuring (volume percentage).
(5) Concentration of sample is a concentration of methane in a leak-proof tank at the end of measuring (volume percentage).
(6) Time of filling of a leak-proof tank with methane to a set concentration level (p. 6) (seconds).
(7) Hourly methane leaks in m^3 are calculated as per the formula (4) and (5)
(8) Annual methane emissions are calculated as per the formula (6)

II. MONITORING MAP

of methane leaks at the gas equipment of GDPs (CGDPs), gas fittings, threaded and flanged connections of PJSC "Poltavagaz" gas distribution networks

The monitoring map determines the general procedure of realization of the annual measuring of methane leaks at GDP (CGDP) gas equipment, gas fittings, flanged and threaded connections of PJSC "Poltavagaz" gas distribution networks, that are included in the JI project boundary.

In accordance with the Project activity (Section A.2 of the PDD), each methane leak detected at GDP (CGDP) gas equipment, gas fittings, flanged and threaded connections of PJSC "Poltavagaz" gas distribution networks must be tagged with an individual number.

With the aim of tagging detected methane leaks with an individual number PJSC "Poltavagaz" draws the Register of gas distribution points and gas fittings of JI Project "Reduction of methane emissions on gas equipment GDP (CGDP), gas armature, flanged and threaded connections of gas-distributing networks of PJSC «Poltavagaz» (hereinafter - the Register), where each facility is tagged with the individual number (code), and also such data are specified:

- place of location of equipment unit (address);
- type of equipment
- type of connection of equipment with the gas transportation system (for shut-down devices);
- number of flanged connections;
- number of the threaded connections;
- conditional diameter;
- gas pressure for equipment ;
- year of introduction to operation;
- installation point (for the gas fittings of gas distribution networks).

In a period from 2005 to 2008 measuring of methane leaks at gas equipment is conducted annually only at the units of equipment, which was repaired, sealed or replaced during the current year, in accordance with the Project Implementation Schedule (p 4 Section A.4.2 of the PDD).

Measuring of volumes of methane leaks at gas equipment during the first repair (replacements) of equipment in accordance with Project Implementation schedule is conducted twice: the first time -before repair (replacement) of equipment, the second time - after repair (replacement).

Beginning from 2009 measuring of volumes of methane leaks is conducted not rarer, than one time per year at each gas equipment unit of PJSC "Poltavagaz" , that is in the Register, to ascertain, that the gas equipment did not become the source methane leaks again.

Technical maintenance of gas equipment that is in the Register is conducted not rarer than one time per half of a year.

Permanent repair of gas equipment that is in the Register is conducted one time per year.

In the case when the monitoring measuring of methane leaks from the gas equipment shows presence of the leak the volume of which exceeds the volume of leakafter the first repair (replacement) of equipment, such equipment must be repaired (substituted) on a priority basis.

Types of data and the parameters used during annual monitoring measurements of methane leak volumes are provided in the Table 4:

Table 4MP. Types of the data and the parameters used during annual monitoringmeasurements of methane leaks volumes

Ty-pe	Properties	Parameter № in the Table 4 of the PDD	Designation	Name to the parameter	Data measuring units
(i)	Data and parameters that are not monitored throughout the crediting period, but are determined only once , and that are available already at the stage of the PDD development	1	i	Sequence number of GDP (CGDP) gas equipment, gas fittings of gas pipeline where methane leak is detected	Dimensionless
		9	V_{bag}	Tank capacity	m^3
(ii)	Data and parameters that are not monitored throughout the crediting period, but are determined only once (and thus remain fixed throughout the crediting period), but that are not already available at the stage of PDD development	-	-	-	-
(iii)	Data and parameters that are monitored throughout the crediting period	2	Ti	Time (hours) when relevant unit of equipment where methane leak was detected was in operation during a year	Hour
		3.	Date	Date of repair (reconstruction)	Month and year
		4.	GWP_{CH4}	Global Warming Potential for methane	tCO_2e/tCH_4
		5.	$F_{CH4,i}$	Methane leak rate for each detected leak	m^3CH_4/hour
		6.	t	Gas temperature	^0C
		7.	P	Gas pressure	MPa
		8.	URi	The uncertainty range for the measurement method applied to leak *i*	%
		10.	$w_{sampleCH4,i}$	Methane concentration in a tank	%
		11.	τ_i	Time when methane concentration reaches a certain level	second

III. METHODOLOGY OF METHANE LEAK MEASUREMENTS

Composition of team for conduction of measuring:
Master of service exploitation of street gas pipelines and court introductions (SESG and CI);
A locksmith on exploitation and repair of gas equipment of GDP - 1 man;
A locksmith SESG and CI - 1 man.

Necessary materials, instruments and devices:
1) Keys, instruments;
2) Highly sensitive gas analyzer EX - TEC® SR5 or EX - TEC® HS 680 or Variotec8-EX - 1 unit.;
3) Leakage-proof tank, leak-proof sack, hose, encapsulant, sticky ribbon (scotch);
4) Manometers;
5) Thermometer;
6) Barometer;
7) Stop-watch;
8) Fire-extinguisher.
There is a chart of unit for realization of measuring of methane leaks (see Figure 6).

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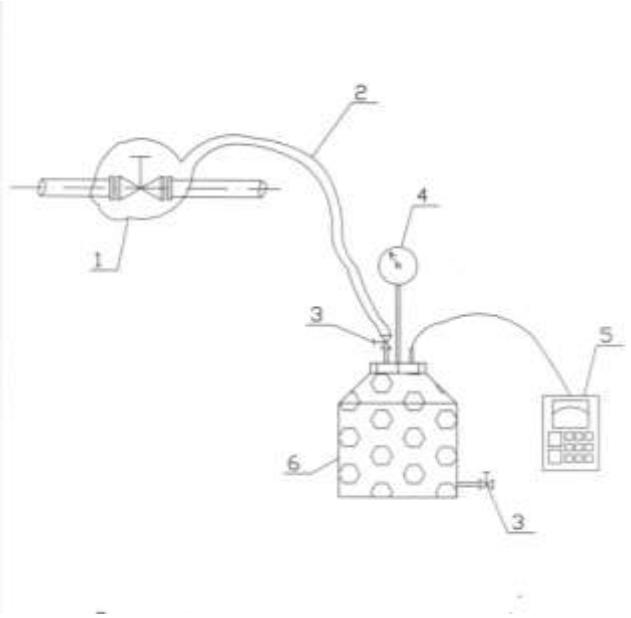

Figuge 6. Scheme of Methane Leak Measuring Device.

References:
1. Leak-proof bag
2. Hose
3. Cock
4. Pressure gauge
5. Gas analyzer EX-TEC® SR5 or EX-TEC® HS 680 or Variotec8-EX.
6. Leak-proof reservoir

Procedure of measuring methane leaks at the gas equipment of GDPs (CGDPs) and gas fittings of gas pipelines:
1. To check whether GDP (CGDP, well) where gas equipment and gas fittings, where measuring will be conducted, are located are gas contaminated or not. To conduct measuring of gas contamination of GDP (CGDP, well) with the gas analyzer EX - TEC® SR5 or EX - TEC® HS 680 or Variotec 8-EX(5).
2. To set a tank (6). To put a sack (1) on an element, on which measuring of methane leaks will be conducted.
3. To connect a sack (1) and tank (6) with the help of the hose (2).
4. By a sticky ribbon to overbalance connection of the hose (2) and sack (1) for impermeability of connection.
5. To measure with the gas analyzer (5) the background concentration of methane in tank (6) and to enter its value in the minutes of measuring.
6. To open a faucet (3) in the place of connection to the hose (2) with a tank (6) and to turn on a stop-watch.
7. To close a faucet (3) in the place of connection to the hose with a tank in 180 seconds, to turn off a stop-watch.
8. By means of gas analyzer (5) to define the concentration of methane in tank and enter its value in the minutes of measuring.
9. Control of pressure of gas in tank (6) is done with the help of the manometer (4).
10. To define the temperature of air by means of thermometer of TL4 type and enter its value in the minutes of measuring.
11. To define atmospheric pressure by a barometer and enter its value in the minutes of measuring.
12. After measuring to disconnect a hose (2) from the tank (6).
13. To open a faucet (3) for ventilation of the tank (6).

Data recorded during measuring of methane leak in protocol of measuring:
1. Name and code of GDP (CGDP) (if measuring is performed at gas equipment of GDP (CGDP).
2. Name, code of GDP (CGDP) gas equipment or gas fittings of gas pipeline on that measuring of methane leak is conducted.
3. Address of location of GDP (CGDP) (if measuring is done at gas equipment of GDP (CGDP)) or gas fittings where measuring of methane leaks is conducted.
4. Date of realization of measuring
5. Temperature of air (^{o}C).
6. Atmospheric pressure (kPa).
7. A background concentration of methane in tank (%)
8. Concentration of methane in tank at the moment of completion of measuring (%)
9. Measuring (180 sec) duration.
10. The last names, name and patronymic of persons that conducted measuring.

IV. GUIDANCE
on monitoring measurement data collection and storage

Realization of JI Project provides for:

1. Initial and further regular monitoring inspections of each gas equipment unit that is in the register and realizations of measuring of methane leaks.
2. Repair (replacement) of old gas equipment.

All data, collected in the process of realization of the JI project, must be collected and entered in one database. The database must be constantly filled in during the JI Project lifetime.Data about the new leaks detected and repaired during the project lifetime must also be included. In monitoring reports on JI Project the data must be included from a database.

It is recommended to create a Working team on the JI Project at the enterprise, and to define responsibility for collection of all information on the JI Project, storage and archiving of documents on the JI Project between the members of the Working team.

Basic information sources for the calculation of methane emission reduction units are documents, the qualities of which are given in Table 5 below:

Table 5MP. List of preliminary documents formed during JI Project implementation

№	The name of document	Document data source	Document format	Person who draws the document	Document is formed for the purpose	Place of document storage
1	Register of gas equipment of GDPs (CGDPs), gas fittings, threaded and flange joints	Technical documentation	Electronics table	Technical personnel and accounting office of the enterprise	To tag the places of methane leaks	The coordinator of JI Project Working team
2	Protocols of measuring of methane leaks	Initial and monitoring measuring	Filled paper forms with measuring data signed by the executing personnel	Masters of exploitation service	To form the information of the beginning and monitoring measurings	The coordinator of JI Project Working team
3	List of the initial and monitoring measuring of methane leaks	Protocols of measuring of methane leaks	Electronic table	Authorized member of Working team	To calculate the volumes of methane leaks	The coordinator of JI Project Working team
4	Calculation of volumes of methane leaks	PDD and Information of the monitoring of methane leak measuring	Electronic table	Authorized member of Working team	To form Monitoring reports	The coordinator of JI Project Working team
5	Loggers of reports on the detection of leaks	Reports of inspectors of exploitation service of gas pipelines and GDPs (CGDPs)	Filled paper forms with data on leaks detected during walk-around once per four days	Masters of exploitation service of pipelines and GDPs (CGDPs)	For leak repair	At departments of exploitation service of pipelines and GDP (CGDP)

№	The name of document	Document data source	Document format	Person who draws the document	Document is formed for the purpose	Place of document storage
6	Loggers of technical maintenance of GDPs (CGDPs)	Supervision of inspectors of exploitation service	Filled paper forms	Workers of exploitation service of GDPs (CGDPs)	To supervise technical state of the equipment	Inside GDP (CGDP)