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

Methane Emissions Avoidance in Bryansk Gas Distribution Network

CONTENTS

Annexes

SECTION A. General description of the project

A.1. Title of the project:

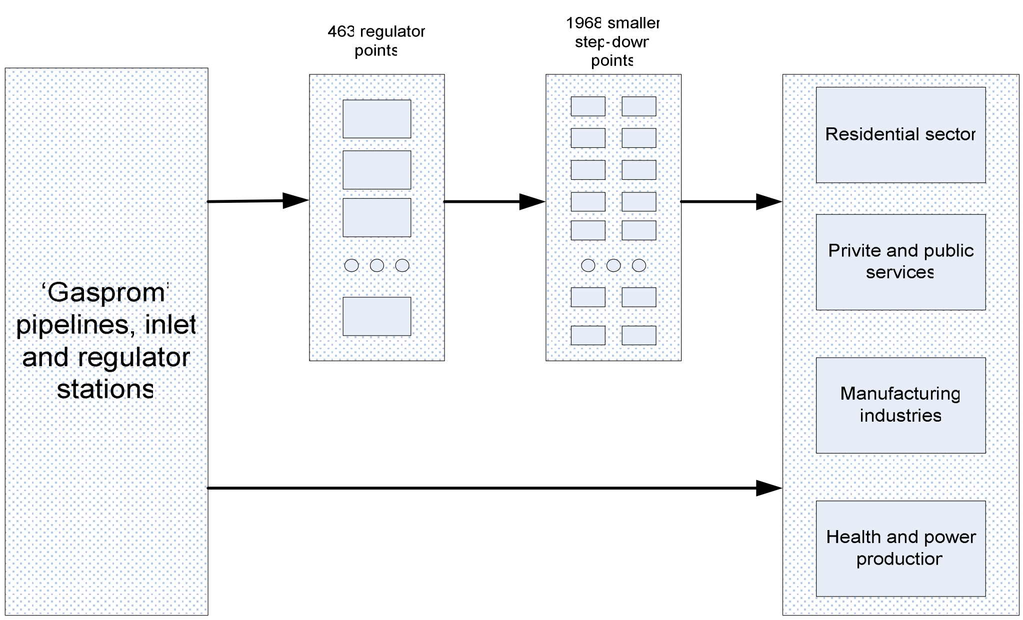
Methane Emissions Avoidance in Bryansk Gas Distribution Network.
Version 01.
October 12, 2006.

A.2. Description of the project:

The purpose of the project is to improve the integrity of Bryansk regional gas distribution network via reducing leakage of methane from the system. The Project implementation will be accomplished by performing detections, measurements and repairing leakages at gas regulator stations and step-down stations in the natural gas distribution system operated by the Company Bryanskoblgas. Leaks could be potentially found in flanges, tube fittings, pipe thread connectors, block valves, regulators, plug valves and pressure relief valves. There are also leaks from fractured parts of pipelines which are not covered by the project. Pipeline leaks are believed to be about 10% of total leaks, although no reliable survey of their contribution exists. Current practices only result in temporary leak reductions from some of the larger leaks, due to the inadequacy of repair materials and practices, as further described B.2 and Annex 2. Current inspection and repair activities are motivated by safety concerns and not by loss of natural gas as a valuable resource or by its detrimental effect on the environment.

Bryanskoblgas operates a medium and low pressure gas distribution system with an annual gas throughput of about 2.7 billion cubic metres (bcm). The supply network covers about 15279.25 km of pipes, including components at 16 bars, 6 bars, 3 bars and low pressure pipes to final residential consumers. There are 463 regulator points and 1968 smaller step-down points (in total 2431 sites) which contains 15,260 valves and approximately 45,780 flanges.

Figure 1 Sketch of pipeline network, Bryanskoblgas



As part of the project activity, all sites will be inspected for leaks from all standardised components. Any leak detected will be measured, recorded and repaired, using Gore-Tex joint sealant and valve stem packing produced by W.L.Gore & Associates (Germany) (see: www.gore.com). Due to the climatic conditions in European part of Russia, project activities in the Bryansk region can be performed only during a period from about mid April to mid November[1]. The leak detection and repair work started in September 2006 and planned to be completed in 2007. If leaks re-emerge those leaks will be measured and repaired again. This will be done in conjunction with the monitoring plan of the JI project. In addition, Bryanskoblgas will use the equipment in its regular leak inspection and maintenance activities on a permanent basis beyond the crediting period of the project.

In addition to the reduction in greenhouse gas (GHG) emissions, the project activity will have important ancillary benefits such as energy conservation to benefit the end users of gas, health effects due to the elimination of asbestos as a repair material, lower risks of accidents related to gas leaks and dissemination of modern technology related to leak detection and repair as well as improved measurement practises.

A.3. Project participants:

The project is developed by AddGlobe, LLC (USA), a private company engaged in development of Joint Implementation projects. AddGlobe, LLC is an investor and has contractual title to emission reductions resulting from the project.

Bryanskoblgas operates and owns the distribution gas system in Bryanskaya oblast. Bryanskoblgas is majority-owned by Gaspromregiongaz, which is Gasprom affiliated company. Gaspromregiongaz and Rosgasifikatsiya have an agreement stating that all projects in gas distribution industry are performed by Rosgasifikatsiya. And for the purpose of Project, Centergasservice-opt, a subsidiary of Rosgazifikatsiya, has been appointed as General Contractor to coordinate all project activities. Bryanskoblgas under supervision of Centergasservice-opt will be responsible for the Project implementation and monitoring of Project emissions.

Party involved	Legal entity project participant (as applicable)	Please indicate if the Party involved wishes to be considered as project participant (Yes/No)
Party A (Host Party) Russian Federation	• OJSC Rosgazifikatsiya • Centergasservice-opt, LLC • OJSC Bryanskoblgas • AddGlobe, LLC (U.S.A.) • Other co-investors to be determined	Yes
Party B Party (Party-buyer)	To be determined	-

PDD was developed by National Methane Center (Russia) on the basis of PDD for similar JI project in Kursk region (“Methane Emission Avoidance in Kursk Gas Distribution Network” project), which has been developed by ECON Carbon, determined and made available for public comments in December 2005 by DNV at its homepage.

[1] This timing may vary and could be as late as mid-November. The timing is determined by the occurrence of 3 consecutive 24 hour periods of below zero weather.

A.4. Technical description of the project:

The project activity consists of three components:

- the identification and measurement of leaks at all regulator and step-down stations in the Bryanskoblgas supply system. Identification of leaks was provided using Heath Gasurveyor, measurement - using Heath Hi-Flow Sampler
- repair of all detected leaks using advanced sealants (i.e. Gore-Tex Joint Sealant and Valve Stem Packing)
- design and implementation of maintenance and monitoring program that involves the training of personnel in the use of advanced leak detection and measurement equipment.

The Hi-Flow Sampler to be used for measurement of detected leaks was developed by the Gas Research Institute in the USA and then tested by the industry from 1997, most notably by Enron. The Hi-Flow sampler differs from organic vapour analyzers (OVA) and other measurement tools in that it provides a direct volumetric measurement of methane flowing from a leak. It is also faster to use and much more accurate. A series of experiments have been conducted to validate the results of the Hi-Flow Sampler. Typical results from laboratory tests show an average difference between metered leaks (with rotameter) and the Hi-Flow Sampler of 3-4% with maximum differences to be slightly above 10%. This is considerably more accurate than with OVA and similar equipment, let alone the equipment currently being used in Russia[2].

Leaks from valves will be repaired using Gore-Tex valve stem packing. This material is a pliable, self-lubricating packing that eliminate stem wear with durable effects. The continuous-length packing installs easily and forms a cohesive cylinder when compressed, eliminating the need to cut and form rings. In most cases it is not necessary to remove the valve from service, and no re-assembly is required. Once installed, a slight turn on the gland nut is all the maintenance that is usually required. The manufacturer of Gore-Tex valve stem packing claims that the equipment has been in service for years in severe operating conditions without faults, and the manufacturer guarantees that the stem packing will be replaced free should it fail, provided that it has been installed properly in a sound valve.

Flanges (that are leaking) will be repaired using a Gore- Tex joint sealant, which is also much more reliable to currently used material, albeit much more expensive (up to 20 times) as Gore-Tex valve stem packing.

A.4.1. Location of the project:

The project activity is conducted for the gas distribution network of Bryanskoblgas which is located throughout the Bryansk region of the Russian Federation. Therefore the project encompasses the entire region.

A.4.1.1. Host Party (ies):

The Russian Federation.

[2] Further information on the development and use of the Hi-Flow Sampler is found on http://www.epa.gov/gasstar/

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

Bryansk region is located in a central part of East-European plain. Bryansk city is 379 km South-West from Moscow. Bryanskaya Oblast borders Belarus Republic, Ukraine and Russian regions Smolenskaya, Kaluzhskaya, Orlovskaya and Kurskaya Oblasts. Bryansk region covers 34,900 sq. km. Population is about 1.5 million people.

Bryanskoblgas is the sole provider of natural gas for the Bryansk region and thus the project encompasses the entire region. All the cities in Bryansk region are included in the project.

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

The capital of the region is the city of Bryansk (458 th. persons population), other largest cities in the region are Klintzy, Novozubkov, Dyatkovo. The region consists of 27 districts and 16 cities and 27 urban-type settlements. The most important industrial branches are engineering industry, electronic industry, chemical industry, timber industry, paper production, textile industry and construction materials production. The part of agriculture in gross output of the region is 20. Bryansk region is located in a zone of forests; total area of forests is about one million hectares.

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

The project will be located in the Bryanskaya oblast in Russia.

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

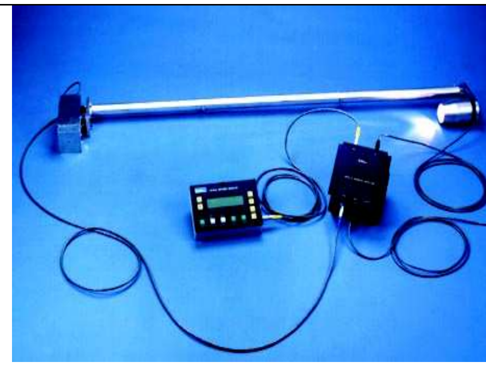
The Gasurveyor 500 Series (see Picture below) will be used under the JI project to detect methane leaks throughout natural gas distribution network; the Gasurveyor 500 Series provides the most flexible measurement range among gas detectors available today.

The Hi-Flow Sampler (see Picture below) is a new technology to be used in Russia. Instruction and training of Bryanskoblgas staff have been organized under supervision of Centergasservice-opt specialists certified by Heath Consultant. Repair will be conducted employing Gore-Tex valve stem packing and joint sealant.

The reliable technology demonstrated documented excellent results in North America and elsewhere. The Hi- Flow Sampler has now been cleared for imports to Russia, and the project activity represents its regular use in the country.

For detection of methane leaks modern remote equipment, Remote Methane Leak Detector and Optical Methane Detector will be tested under the JI project in Bryansk region. On the basis of testing, a special instruction on the use of this equipment will be developed for monitoring purposes and added to Annex 5.

Remote Methane Leak Detector (RMLD)


Optical Methane Detector (OMD)

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 reduces anthropogenic GHGs by the near elimination of methane emissions from components at regulator and step-down stations operated by Bryanskoblgas.

Typically, in current practice repaired leaks re-emerge due to the poor quality of sealing material.

The predominant material used currently for valves is a packing consisting of a round twisted cord made of flax sodden with oil, graphite and asbestos. The material loses containment after pressure variations and weather changes. For flanges elastic oil and gasoline resistant rubber and paronite (compressed asbestos gaskets) are used.

The project activity offers a comprehensive programme for inspection and detection for leaks from components at regulator stations and step-down stations. By use of catalytic oxidation/thermal conductivity detectors practically all leaks from these components will be traced and measured then with Hi-Flow Sampler. The Gore-Tex joint sealant and valve stem packing offer a durable elimination of leaks. It is therefore expected that emission reductions will be equal or close to the level of (ex-ante) measured leaks, although annual monitoring will establish whether repairs have been effective. During the missions to Bryansk in September-October 2006, 371 valves were repaired with Gore Tex sealing material. Leaks prior to the repair showed an average of 7.43 litres per minute. Leak rates after repair were zero for all valves.

The gas distribution company has in the absence of the project activity no financial income from reducing methane leakage. The company does not purchase and sell the gas, but is merely paid by the volume of gas distributed. Therefore, the current procedures in Bryanskoblgas which are in common practice in the Russian Federation are aimed at detection and repair of leaks representing a safety risk. The technology applied for the current detection and repair practises is inferior to what will be acquired and used for the JI project. The "additionality" arguments under JI Track Two are further developed in section B.2 below.

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

Length of the crediting period	**Annual estimation of emission reductions (tons of CO2e)**
2006	-
2007	52905,88
2008	897048,64
2009	897048,64
2010	897048,64
2011	897048,64
2012	897048,64
Total estimated emission reductions over the crediting period	4 538 148,08
Total number of crediting years	6, if early crediting will be applicable
Total for 2008 to 2012	4 485 243,23
Annual average of estimated emission reductions over the crediting period	897048,65

A.5. Project approval by the Parties involved:

Natural gas supply to Russian industries and population is one of priority tasks identified by the Government of the Russian Federation.

Formal approval of the project as a JI project is expected when national Russian JI procedures will be approved by the Government of the Russian Federation.

SECTION B. Baseline

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

This is a new methodology, based on the PDD for similar project in Kursk region ("Methane Emission Avoidance in Kursk Gas Distribution Network" project) developed by ECON Carbon in the format approved for the CDM projects by the CDM Executive Board.

The JI project activity is the detection, measurement and repair of methane leaks from valves and flanges at the regulator stations and step-down stations of the Bryanskoblgas gas distribution network. The project developers have engaged an international consultant (Heath Consultants, U.S.A.) for certification of Russian experts who undertook surveys of leaks at the stations as preparation for the project activity and this PDD, which makes possible equipment testing according to local conditions.

As a part of surveys leaks were detected using catalytic oxidation/thermal conductivity detectors (Heath Gasurveyor 500 Series, see www.heatus.com). Once leaks where identified, leak rate measurements were made using the Hi-Flow Sampler. The Hi-Flow Sampler uses a high flow rate of air to completely capture the gas leaking from components. A catalytic oxidation/thermal conductivity sensor is then used to measure the sample concentration in the air stream of the high flow system. The Hi-Flow Sampler essentially performs an enclosure measurement using the flow regime induced by the sampler instead of a physical enclosure.

The surveys were conducted during the missions to Bryansk in September-October 2006. During this mission 371 valves and 981 flanges were inspected for leakages. Practically no leaks were detected at the flanges whereas 32.35% of the valves had leaks at an average leak rate of 7.43 litres per minute (LPM) (see Table 1).

Table 1 Summary results from survey of leaks, Bryanskoblgas, September-October 2006

	Inspected components			Measured leaks			
	Inspected	Leaks indentified	% with leaks	Liters per minute	Leak rates - lpm		Total per year
Survey September-October 2006 - 60 stations					all valves	with leaks	m3/year
Valve Stem Packing	371	120	32,35%	2758,7	7,43	22.98	897048,64
Flanges	981	0	0,0%	0,0	0,0	0,0	0,0

This rate of leakage provides evidence that leaks are wide-spread and significant within the system. (Annex 4 provides details for the survey).

In order to describe the baseline and the Project activity scenario and analyse why emissions in the baseline scenario would likely exceed emissions in the JI project activity scenarios, we assume that:

a. Emissions are properly measured before leak repair **at all sites** in the project boundary. The measured baseline leak rate is assumed to stay constant over the crediting period (till the end of 2012).

b. The project activity emissions will be emissions measured after leak repair. It is expected that few, if any, leaks will be detected after repair (project activity leak rate =0).

c. All points will be monitored in a proper manner within a crediting period as described in Annex 4.

The described methodology is considered to be reliable and conservative because it is based on direct measurement (not on indirect calculations) of all points before repair works, after repair works and during the monitoring.

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

Baseline scenario

The baseline scenario represents a continuation of the current program for leak detection and maintenance of Bryanskoblgas. Leaks are detected within the city limits because of the odor and/or knowledge of some activity that would likely cause leakage (as with some type of construction or accident etc). Various leak detection devices are used, but primarily in relation to inspection of pipelines in accordance with Industry Standard OCT 153-39.3-051-2003, which prescribes the frequency at which pipelines should be inspected.

Approximately 35 % of the valves and flanges are located in the city of Bryansk. Valves and flanges located within the city, should, according to industry standards No. 153-39.3-051-2003, be checked once a month and outside the city once every six months. Due to resource constraints, however, this frequency may not always be achieved. The portion of valves and flanges that leak outside the city is therefore probably higher than in the city. Prior to the first leak rate measurements done in September-October 2006 there have not existed any reliable estimates of leak rates.

The main material that is used at the valves is a gas pipeline packing consisting of a round twisted cord made of flax soaked with oil, graphite and asbestos. This material looses containment after pressure variations and under the influence of changing weather. Initially the cord is elastic due to the oil, and the cord fills all holes between rod and valve walls. After some period of time (approximately 1-2 months), the cord dries out. It is still vapor-proof until the rod is adjusted when regulating pressure. After this, the packing needs to be replaced because it will leak.

According to baseline scenario leak occur randomly in spite of conducted regular repair works due to imperfection of currently used sealing material. These leaks are considered to be unavoidable technical losses. Preliminary survey indicates that leaks in Bryanskoblgas occur on 32,35%of valves and flanges and average leak rate 7,43 lpm (compared to all number of the valves and flanges). These values were taken for baseline estimates. Exact amount of ERUs will be calculated after implementation of 100% measurements works.

Further details of baseline practices are presented in Annex 2.

Project scenario

The project scenario envisages that all valves and flanges potentially related to the project boundary will be detected for leaks. If a leak would appear it will be properly measured and repaid with modern sealing materials. If there is no leak in valve, the old sealing materials will be also replaced by the modern one in all valves. Sealing materials in flanges will be replaced only if a leak is detected, because most of flanges have no leaks in baseline and those few of them with measured leaks are very low. All valves and flanges within the project boundary will be monitored during the crediting period.

Project participants have already formed crews in Bryansk and in Moscow for implementation of leak measurements and sealing material replacement during the crediting period and solved the problem with required resources, equipment for measurements and modern sealing materials for leak liquidation.

Because the project will use high quality sealing materials it is possible to expect that no new leaks will appear during the crediting period. In the event that a new leak is detected after repair it will be measured, repaid and monitored.

Because the project foresees use of modern Gore-Tex sealing materials, more frequent inspections of leaks and effective monitoring, emissions under the project activity will be obviously lower than under baseline scenario and close to zero.

Additionality

Annex I Parties to the UNFCCC including Russia, participating in JI, have two options for JI, depending on whether they are in full or partial compliance with the eligibility criteria. The second procedure, Track II, involves an international process that is similar to CDM and requires testing additionality issues.

Two Track Procedures for Hosting JI Projects

JI Track One may be applied when the Annex I Party hosting the project fully meets all the eligibility requirements to participate in the mechanisms. In this case, the host Party may apply its own national rules to the selection of JI projects and the estimation of emission reductions. The host Party may also issue ERUs and transfer them to project participants.

JI Track Two can be used if the host Party does not meet all eligibility requirements. In such cases, the project and the quantity of ERUs it generates must be verified under rules and procedures supervised by the JI Supervisory Committee, which is an international body established under the Kyoto Protocol. The rules include independent verification/determination of the emissions baseline and monitoring plan and independent certification of the monitored reductions before ERUs can be issued. The details of the JI procedures are still being elaborated, including the Project Design Document (PDD), but they will likely be similar in scope to those of the CDM. For now, approved CDM baseline and monitoring methodologies can be used for JI projects. Most of the JI projects developed to date have followed Track II JI procedures.

Under assumption that the project will be implemented under the JI Track Two, the additionality test follows the “Tools for the demonstration of and assessment of additionality” issued and recommended by the CDM Executive Board. All the recommended steps are relevant and will be addressed.

Step 0 – Preliminary screening based on the starting date of the project activity

Not relevant for JI.

Step 1 – Identification of alternatives to the project activity consistent with current laws and Regulation

Sub-step 1a

Only two scenarios are considered plausible and credible alternatives as a baseline:

1. The proposed project activity, and
2. Continuation of the current leak detection and repair practice.

Bryanskoblgas does not have incentives or the means to undertake the efforts of the project activity in the absence of project activity.

Result: Pass

Sub-step 1b. Enforcement of applicable laws and regulations

State Regulation No. 344 issued on 12 June 2003 set a pollution tax on 225 pollution substances, one of which is methane. The tax rate for methane pollution is equal to 50 rub (approximately $ 1.75) per 1 tCH_4 for emission within fixed limits (established case-by-case by tax authorities) and 250 rub. per 1 tCH_4 (approximately $ 8.75) if pollution is over fixed limits. It is far below the price for natural gas even in the domestic market (approximately $ 43.5 taking into account that a ton of CH_4 is equal to 1.45 th. m^3).

The pollution tax for leaks up to the threshold of 0.6 % is paid by Bryanskoblgas. The tax is then reimbursed Bryanskoblgas by the gas supplier company, who eventually pass on this cost to gas consumers. In principle, Bryanskoblgas should cover the pollution tax for gas leaks above the 0.6% threshold. However this tax is currently not collected because:

- Neither the regulating authority nor companies have sufficient measurement practices to determine pollution volume.
- No pollution emission limits are established. It requires solid data based on pollution measurement of all pollutants in all spheres and all regions of the Russian Federation. As no pollution measurements are being conducted at present it will take much time to compile this database.
- There is no methodology to calculate the volume of pollution emission.

In summary, Bryanskoblgas is not faced with any financial penalty from the pollution tax and hence no financial gain is made in terms of less taxation from reduced leaks. Enforcement of State Regulation No. 344 and issuance of any new regulation that might affect additionality will be monitored (see Annex 3 Monitoring Plan).

Result: Pass

Step 2 – Investment Analysis

Absent JI benefits, the project owners do not have any direct economic benefits from the leak reductions achieved through the project activity. Bryanskoblgas is a provider of transport services for the gas supplied from JSC Gazprom to final consumers. JSC Gazprom is the supplier of gas from the high pressure gas pipeline and has meters to determine the amount of gas entering the Bryanskoblgas distribution system.

According to Governmental regulation No 162 issued 5th February 1998, JSC Gazprom can charge end use consumers (i.e. not Bryanskoblgas but the final users) for the gas metered at the exit of the high pressure gas pipeline minus a 0.6% stipulated loss, as “allowable gas volume losses” Since Bryanskoblgas is only paid for the transport volume of gas, metered when it enters its gas system, there is no benefit to Bryanskoblgas for reducing distribution losses. Only the end users of gas who will benefit from reduced losses since they currently pay for a higher volume of gas than what is actually delivered.

In addition the Gore-Tex repair material is approximately 10-times more expensive than the domestically manufactured material which currently is being used.

Result: Pass

Step 3 – Barrier Analysis

The project activity involves the use of advanced leak detection and measurement practices and equipment. Such equipment and practices are relatively new and not yet used on a broad scale internationally, see http://www.epa.gov/gasstar/. The project activity supposes that modern catalytic oxidation/thermal conductivity detectors and a Hi-Flow Sampler are used to identify and measure gas leaks in Russia**.** The project activity requires not only the purchase of the relevant equipment but also training of Bryanskoblgas staff to operate it.

It is the prospect of JI financing that has enabled the project developer to make preparation of the JI project activity. This includes the purchase of one Hi-Flow Sampler, missions to undertake sample leak detection, measurements and repairs and the initial training of local staff.

Current practices within Bryanskoblgas, as with most companies in this industry, work in the following manner: (1) all leaks are essentially passed on in the bill to consumers so there is no incentive to eliminate leaks; and (2) to inspect the pipeline for leaks would require increased staff with required special technical training and this is not seen as cost effective by the companies.

The current repair of leaks using graphite and other material is the least-cost method of repairing leaks but is technically inferior to using Gore-Tex. However, taking into account Bryanskoblgas financial situation the continued use of graphite is the preferred option.

Result: Pass

Step 4 **-** *Common Practice*

The financial incentives described under step 2 and barriers described under step 3 are not only relevant to Bryanskoblgas but prevalent throughout the low pressure gas distribution system in Russia.

For this reason the approach taken in leak detection and repair presented as the baseline scenario of this project is common practice in Russia.

By and large the same leak detection devices as in Bryansk are used throughout Russia and the use of repair material to reduce leaks differs little from region to region. Equipment to measure leak rates is not available to any gas distribution company in Russia, and repair material used are normally either graphite or asbestos. Under the climatic conditions of the winter season in Russia such materials offer only temporary reductions in leak rates. In addition, leaks that occur during the winter are rarely repaired because in order to make the repair the pipeline should be shut down. With a pipeline shutdown the customers at the service end of the pipeline no longer have gas, which means lack of heat or hot water for the duration of the pipeline/leak repair. For these reasons there is very little, if any, winter repair.

Result: Pass

Step 5 – Impact of JI Registration

The expected income from the sale of AAUs (for 2007 if it will be applicable according to the Russian national JI procedures) and ERUs (for 2008-2012) is for the project developer the only source of revenues from the project. Without these revenues the projects developer would not have the means to undertake the activities of the project.

Result: Pass

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

There are 463 regulator points and 1968 smaller step-down points (in total 2431 sites), operated by Bryanskoblgas, which contains 15,260 valves and approximately 45,780 flanges. All valves not depending on the leak rate and only leaking flanges are included in the project boundary. The exact number of leaking valves and flanges will be stated after measurement works. Valves and flanges within the boundary of the project are located at medium (0.3 MPa) and low pressure (0.003 MPa) pipelines. Only methane emission reductions at the sites are included in the project.

No leakage (GHG emission impacts out of boundaries of the project by the project activities) is expected.

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

Baseline was developed in October 2006 by the National Methane Center, Russia.
National Methane Center was established in spring 2005 as a non-commercial partnership for consultancy purposes serving the founders by OJSC Rosgazifikatsiya, OJSC Mezhregiongas (Gazprom daughter Company) and Centergasservice-opt.

National Methane Center’s contact information:

Mr. Ilya Kramarenko
Executive Director
28/1, building 2, Krasnoprudnaya Street,
Moscow 107140, Russia
E-mail: kiv@cgazs.ru

National Methane Center is not a project participant.

SECTION C. Duration of the project / crediting period

C.1. Starting date of the project:

September 2006

C.2. Expected operational lifetime of the project:

At least till 01.01.2013.

C.3. Length of the crediting period:

2007 – 2012 (if early crediting will not be applicable according to the Russian national JI procedures to be approved by the Government of the Russian Federation) or the length of crediting period will be 2008-2012).

If post first commitment period under the Kyoto Protocol will be applicable, the crediting period may be expanded up to maximum 21 years as a whole.

"Early credits" in the form of assigned amount units (AAUs) will be sought for 2007, and emission reductions units (ERUs) will be earned for 2008 to 2012. Pending decisions on the framework for generation and transfer of emissions reduction credits post 2012, the project developers may seek the right to earn credits for the period 2013 to 2017.

SECTION D. Monitoring plan

D.1. Description of monitoring plan chosen:

The monitoring methodology assumes the use of certain type of technologies. The catalytic oxidation/thermal conductivity detectors used for leak detection and the Hi-Flow Sampler will be used for leak measurement in the project activity (see also A.4.2).

All leaks must be identified and measured, as well as a monitoring system must ensure that leaks repaid remain repaid during the whole crediting period. If leak re-occurs after it was repaired, it will be considered that the leak started after the day of the previous inspection of this site.

The monitoring plan includes all data necessary for estimation of anthropogenic GHG emissions by sources occurring within the project boundary. It also outlines the process that is to be used to collect and archive all relevant data.

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

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

ID number *(Please use numbers to ease cross-referencing to D.2.)*	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
D-1	*Z Number*	*Number of Component inspected and repaired and then resurveyed.*	*Number*	*M*	*Once*	*100%*	*Electronic*	*Each component will be tagged with a number and monitored after repair for re-emerging leaks. To support documentation digital photography will be used.*
D-2	$Mz_{periodt}$ *Time*	*Minutes of equipment operation for each*	*# of minutes per reporting*	*M*	*Constant*	*100%*	*Electronic*	*Based on records of the time of initial repair and subsequent monitoring, minutes the component has been in operation during the*

		component	*period*					*reporting period is counted*
D-3	*Time*	*Repair and monitoring log*	*Date of repair and monitoring*	*M*	*Constant*	*100%*	*Electronic*	*Time of repair or monitoring (date, hour, minutes) will be recorded for each component that is repaired as part of the JI project activity. In cases of re-emerging leaks, the reemerging leak will be assumed to have occurred the minute after the most recent check which showed no leak.*
D-4	$LMPz_{periodt}$ *Leak rate of* CH_4 *for each leak detected*	*Project leak database*	*Litre per minute*	*M*	*Constant*	*100%*	*Electronic*	*For each leak point the leak rate is measures twice and the higher rate is used for calculation of emissions.*
D-5	GWP_{CH4} *Global Warming Potential*	*IPCC*	*Tons of CO2 equivalent*	*C*	*Constant*	*100%*	*Electronic*	*Project developer will monitor any changes in the methane global warming potential value published by the IPCC*
D-6	*Temperature and pressure*	*Temperature and pressure of leaks*	^{o}*C and bar*	*M*	*Constant/periodically*	*100%*	*Electronic*	*Measured to calculate the density of the CH4. Although these variables will be measured, it is not expected that there will be much variance because the pressure and temperature within stations are expected to be basically constant*

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

Project emissions are those detected and measured as re-emerging leaks (i.e. faulty leak repairs). The leaks will be identified and measured in a manner similar to the baseline calculation. However, unlike the calculations of baseline emissions which are only done once prior to the initial repairs, project emissions are calculated regularly as part of the Monitoring Plan.

Total project emissions (TPECO2periodt) for a period t (one specific period covered by a monitoring report) is the accumulated leaks over the period for components where re-emerging leaks have been detected and measured. Leaks for each component are calculated as the leak rate (liters per minute) multiplied by the length of the period (minutes). It follows from this that the leak rate for each component is assumed to stay constant over the course of the period.

The sequence of these calculations and the formulas applied are as follows:

(1) $PEz_{periodt} = Mz_{periodt} * LMPz_{periodt}$

$PEz_{periodt}$ is leak from component z during period t. Each component covered by the JI project activity has a unique serial number z.

$Mz_{periodt}$ is the number of minutes component z has been in operation from start to end of period t.

$LMPz_{periodt}$ is measured leaks of CH_4 at the end of period t from component z, measured in liters per minute.

(Components where the repair has been effective (no faulty repair) will have $LMPz_{periodt} = 0$)

(2) $TPE_{periodt} = \_\ PEz_{periodt}$ =(Sum over all components/serial numbers with leaks)

(3) $TPE_{CO2periodt} = TPE_{periodt} * GWP_{CH4}$

$TPE_{periodt}$ is CH_4 emissions from re-emerging leaks for period t.

GWP_{CH4} is the Global Warming Potential of methane (in tons CO_{2eq}/m^3 methane).

The GWP is calculated by converting the volume of methane calculated from the Hi-Flow Sampler measurements to tons of methane using the molecular weight and molecular volume of methane: tons of methane per cubic meter of methane (tCH_4/m^3CH_4). At standard temperature and pressure (1 degree Celsius and 1,013 bar) the density of methane is 0.0007168 tCH_4/m^3CH_4. This value is then multiplied by the IPCC-1996 conversion of 21 tons CO_{2eq}/tons CH_4. Again at standard pressure and temperature this is 0.015028 tons CO_{2eq}/m^3 methane.

D.1.1.3. Relevant data necessary for determining the baseline of anthropogenic emissions of greenhouse gases by sources within the project boundary, and how such data will be collected and archived:

ID number *(Please use numbers to ease cross-referencing to D.2.)*	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
D-1	*Z Number*	*Number of component inspected and repaired and then resurveyed.*	*Number*	*M*	*Once*	*100%*	*Electronic*	*Each component will be tagged with a number and monitored after repair for re-emerging leaks. To support documentation digital photography will be used.*
D-2	$Mz_{periodt}$ *Time*	*Minutes of equipment operation for each component*	*# of minutes per reporting period*	*M*	*Constant*	*100%*	*Electronic*	*Based on records of the time of initial repair minutes the component has been in operation during the year is counted*
D-3	*Time*	*Repair and monitoring log*	*Date of repair and monitoring*	*M*	*Constant*	*100%*	*Electronic*	*Time of repair or monitoring (date, hour, minutes) will be recorded for each component that is repaired as part of the JI project activity.*

D-4	$LMPz_{periodt}$ *Leak rate of* CH_4 *for each leak detected*	*Project leak database*	*Litre per minute*	*M*	*Constant*	*100%*	*Electronic*	*For each leak point the leak rate is measured twice and the lower rate is used for calculation of emissions.*
D-5	GWP_{CH4} *Global Warming Potential*	*IPCC*	*Tons of CO2 equivalent*	*C*	*Constant*	*100%*	*Electronic*	*Project developer will monitor any changes in the methane global warming potential value published by the IPCC*
D-6	*Temperature and pressure*	*Temperature and pressure of leaks*	^{o}*C and bar*	*M*	*Constant/periodically*	*100%*	*Electronic*	*Measured to calculate the density of the CH4. Although these variables will be measured, it is not expected that there will be much variance because the pressure and temperature within stations are expected to be basically constant*

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

The baseline emissions are calculated using the leak rates measured by the Hi-Flow Sampler prior to the initial repair. For the purpose of these calculations it is assumed that pre-repair leak rates, measured for each component, in absence of the JI project activity would have stayed constant over the crediting period of the project.

The sequence of the calculations and the formulas applied for baseline emissions are as follows:

(1) Lzperiodt = Mzperiodt*BLMPz

Lzperiodt is calculated baseline leak from component z for period t. z is the unique serial number of a component repaired under the JI project activity.

Mzperiodt is the number of minutes component z has been in operation during period t.

BLMPz is the measured (baseline) leak rate (litres of CH4 per minute) prior to repair

(2) TLperiodt= ∑ Lzperiodt =(Sum over all components/serial numbers of the JI project activity)

TLperiodt is total CH4 emissions calculated for all components covered by the JI project activity components subject to repair) as baseline emissions for period t

(3) BECO2 periodt = TLperiodt * GWP

BECO2periodt is the baseline emission in CO2eq calculated for period t from all components that have been repaired as part of the JI project activity

The GWP is calculated by converting the volume of methane calculated from the Hi-Flow Sampler measurements to tons of methane using the molecular weight and molecular volume of methane: tons of methane per cubic meter of methane (tCH4/m^3CH4). At standard temperature and pressure (1 degree Celsius and 1,013 bar) the density of methane is 0.0007168 tCH4/m^3CH4. This value is then multiplied by the IPCC-1996 conversion of 21 tons CO2eq/tons CH4. Again at standard pressure and temperature this is 0.015028 tons CO2eq/m^3 methane.

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

All methane leaks will be directly monitored. This is a reason that the Table D.1.2.1 below is the same as the table D.1.1.3.

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

D-1	*Z Number*	*Number of Component inspected and repaired and then resurveyed.*	*Number*	*M*	*Once*	*100%*	*Electronic*	*Each component will be tagged with a number and monitored after repair for re-emerging leaks. To support documentation digital photography will be used.*
D-2	$Mz_{periodt}$ *Time*	*Minutes of equipment operation for each component*	*# of minutes per reporting period*	*M*	*Constant*	*100%*	*Electronic*	*Based on records of the time of initial repair minutes the component has been in operation during the year is counted*
D-3	*Time*	*Repair and monitoring log*	*Date of repair and monitoring*	*M*	*Constant*	*100%*	*Electronic*	*Time of repair or monitoring (date, hour, minutes) will be recorded for each component that is repaired as part of the JI project activity.*
D-4	$LMPz_{periodt}$ *Leak rate of* CH_4 *for each leak detected*	*Project leak database*	*Litre per minute*	*M*	*Constant*	*100%*	*Electronic*	*For each leak point the leak rate is measured twice and the lower rate is used for calculation of emissions.*
D-5	GWP_{CH4} *Global Warming Potential*	*IPCC*	*Tons of CO2 equivalent*	*C*	*Constant*	*100%*	*Electronic*	*Project developer will monitor any changes in the methane global warming potential value published by the IPCC*

D-6	*Temperature and pressure*	*Temperature and pressure of leaks*	^{o}*C and bar*	*M*	*Constant/periodically*	*100%*	*Electronic*	*Measured to calculate the density of the CH4. Although these variables will be measured, it is not expected that there will be much variance because the pressure and temperature within stations are expected to be basically constant*

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):

See Section D.1.1.4.

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

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

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

No leakage is expected under the project.

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 under the project because of technology described above. If reemerging leaks occur it will be documented according to monitoring procedure and deducted from the volume of ERUs upon the project.

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

Project emissions result from not 100% effective repairs. Ex-post leak detection and measurements will determine project activity emissions (the occurrence of re-emerging leaks). Since this is the first project of this kind in Russia, no data currently exist on frequency of re-emerging leaks. It is considered unlikely that re-emerging leaks will result in emissions, which are greater than 5% of baseline emissions.

As described in Section B, baseline emissions are derived from the leak rate measurements collected in the first year of project implementation, when all components will be prepared. Surveys representing 2.43% of the components covered by the project activity suggest that baseline emissions are 897048.64 tons/year of CO_2 equivalent.

In order to keep the emission reductions estimates conservative it is assumed that they will be 1.9% lower than the ex-ante calculations of baseline emissions, which is 880,000 CO2 equivalents per annum once all initial repairs are done.

CH_4 sources: 4 400 000 tons of CO_2 equivalents are ERUs for the period 2008 to 2012, and 880,000 tons of CO2 equivalents are AAUs for 2007 (if early crediting will be applicable according to the Russian national JI procedures to be approved by the Government of the Russian Federation).

If post first commitment period of the Kyoto Protocol will be applicable appropriate emission reductions will be added to the carbon crediting.

Estimations of emission reductions generated by the JI project

Years	**Annual estimation of emission reductions in tons of CO2e**
2006	-
2007	51,800
2008	880,000
2009	880,000
2010	880,000
2011	880,000
2012	880,000
Total emission reductions	**4 451 800**

Total number of crediting years	**At least 7 years**
Total for 2008 to 2012	4 400 000

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

The project activity does not require infrastructure or equipment that would yield any substantial local or regional environmental impacts. The result of the project activity, reduced emissions of CH_4, represents a reduction of risks particularly associated with indoor leaks.

D.2. Quality control (QC) and quality assurance (QA) procedures undertaken for data monitored:

Data *(Indicate table and ID number)*	Uncertainty level of data (high/medium/low)	Explain QA/QC procedures planned for these data, or why such procedures are not necessary.
D.1	Low	Each valve for which a leak is detected will be tagged with a unique serial. After repair, the valve will be monitored for any additional leaks.
D.2 and D.3	Low	The data logger capability of the Hi-flow sampler will be used. For double checking purpose and documentation, digital photography will be taking of the display reading next to the leaking component with numerical tag. Digital photography will be archived in the Repair and Monitoring Log at the office of Bryanskoblgas for the period until two years after the crediting period.
D.4.	Low	Leak rates will be measured and double checked before repair – major discrepancies (10%) will warrant a new set of tests. Should the hi-flow sampler or other equipment need recalibration or adjustment to ensure their accuracy, the project participants will take the necessary action to do so.
D.5	Low	Project participants will keep track of any new GWPs adopted by the COP.
D.6	Medium/Low	Data recording equipment will be calibrated and double checked on a regular basis.

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

Monitoring plan will be implemented by Bryanskoblgas staff. Bryanskoblgas will provide detection and measurement of methane leaks by its certified technicians, repair works and documentation of leaks during the whole crediting period. AddGlobe, LLC and Centergasservice-opt will provide methodological supervision and support to Bryanskoblgas, as well as measurement equipment and Gore-Tex sealing materials.

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

National Methane Center (Russia).

Contact information:
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Executive Director
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SECTION E. Estimation of greenhouse gas emission reductions

E.1. Estimated project emissions:

The estimate of emissions reductions to be achieved through the project activity is based on data from the surveys conducted in September-October 2006. Measured average leak rates for the sample of components inspected were 7.43 liters per minute (lpm) for leak screw packing, and zero rate for flanges. Applying these rates for entire population of components gives an annual level for the leaks of 59 million m^3 of gas. Converting this to CO_2 equivalents using the factor 0.0007168 to convert one m^3 of CH_4 to on ton of CH_4 and taking into account that the global warming potential of one ton of CH_4 is 21 ton of CO_2 equivalents, the annual emissions are 897048,64 tons of CO_2-equivalents as shown in Table 2.

Table 2 Estimates of leaks from regulator and step-down station operated by Bryanskoblgas.

	Inspected components			Total emission per year		
	Survey	*JI project*	*LPM*	*m3*	*tCH4*	*tCO2e*
Valve Stem Packings	371	15260	7.43	59 593474,08	42716,60	897048,64
Flanges	981	45780	0	0	0	0
Total	**1352**	**61040**		**59 593474,08**		**897048,64**

The surveys represent 2.43 % of valves and flanges and whether this is a representative sample cannot be fully assessed. All of inspections were done in or near the city of Bryansk, but it is expected that leaks rates at the countryside might be higher.

315 valves in the countryside were also inspected. Leak frequency in the countryside was approximately equal with the leak frequency at the valves within a city. Experience of other projects is that leak frequency within a city is slightly higher that in the countryside. The reason for this might be that valves in the cities are subject to more fluctuations in pressure, which often creates leaks, than at stations in the country side. On the other hand, the frequency of inspections and repair at stations in the cities is higher and this, all other factors being equal, suggests that frequencies and leak rates should be higher in the country side. Leak rates at flanges are very low and this may become different once a larger portion of inspection and measurements are done in the countryside, due to the rare inspection and repair of these flanges.

Repair activities of the JI project may not be 100% effective, particularly if the repair work has not been done properly. Failures in repair will be detected and rectified (see the Monitoring Plan) and this in turn will adequately be reflected in the emission reduction calculations. Taking this eventually (re-emerging leaks) into account and provisions for uncertainty in measurements done in September-October 2006, we have here estimated the emission reductions to be 880.000 CO_2 equivalents per annum (1.9% below the estimate of Table 2), once all the sites and component have been inspected. This is a conservative estimate of emission reductions also because gas consumption in Bryansk is expected to grow by 3-4% per year.

All repair works were done in September-October 2006 after the inspection of 371 components. It is expected that all valves (currently 15.260) will have been inspected, measured and repaired by the end of October 2007. A first full monitoring of these repairs will be done before the end of October 2008 (see Monitoring Plan). If we assume that repairs are done in 2007, the estimated emission reductions for every subsequent year (starting 2007) till 2012 will be about 880,000 tons CO_2 equivalent.

Leak detection and repair activities will be continued also in and after 2007 through new inspections at already visited sites. This will be a part of regular inspections and maintenance program initiated by the JI project, and will be coordinated with the activities described in the Monitoring Plan.

Total AAUs and ERUs for 2007-2012: 4 538 148,08 tons of CO_2e.

Total ERUs for 2008-2012: 4 485,243 tons of CO_2e.

E.2. Estimated leakage:

No leakage is expected.

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

Total AAUs and ERUs for 2007-2012: 4 538 148,08 tons of CO_2e.

Total ERUs for 2008-2012: 4 485,243 tons of CO_2e.

E.4. Estimated baseline emissions:

897048,64 tons CO_2e per year, or in total for 2008-2012 – 4 485 243,23 CO_2e

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

Total AAUs and ERUs for 2007-2012: 4 538 148,08 tons of CO_2e.

Total ERUs for 2008-2012: 4 485,243 tons of CO_2e.[3]

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

Year	Estimated project emissions (tons of CO_2-equivalent)	Estimated leakage (tons of CO_2-equivalent)	Estimated baseline emissions (tons of CO_2-equivalent)	Estimated emission reductions (tons of CO_2-equivalent)
2006	Zero emissions	-	-	-
2007	Zero emissions	-	52905,88	52905,88
2008	Zero emissions	-	897048,64	897048,64
2009	Zero emissions	-	897048,64	897048,64
2010	Zero emissions	-	897048,64	897048,64
2011	Zero emissions	-	897048,64	897048,64
1012	Zero emissions	-	897048,64	897048,64
Total (2007-2012)	Zero emissions	-	4 538,148	4 538,148
Total (2008-2012)	Zero emissions	-	4 485,243	4 485,243

[3] In order to keep the emission reductions estimates conservative it is assumed that they will be 4.6% lower than the ex-ante calculations of baseline emissions, which is 100 000 CO2 equivalents per annum once all initial repairs are done.

SECTION F. Environmental impacts

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

The project activity does not require infrastructure or equipment that would yield any substantial local or regional environmental impacts. The result of the project activity, reduced emissions of CH_4, represents a reduction of risks particularly associated with indoor leaks.

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:

No additional environmental impacts are expected under the project.

SECTION G. Stakeholders' comments

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

Since the project is considered to have no negative environmental or social impacts, no local stakeholder involvement has been conducted. The authorities in Bryanskaya Oblast have expressed strong support for the project. Russian office of WWF in Moscow is also expected to be involved to stakeholders' comments activities.

Annex 1

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Annex 2

BASELINE INFORMATION

The annex consists of two sections:

- The first section presents an overview of baseline leak detection and repair activities of Bryanskoblgas
- The second section explains how baseline leaks are estimated and makes the argument that these estimates provide a basis for conservative calculations of emission reductions

It should be underlined that calculation of baseline emissions to assess emission reductions will be available during project implementation only (prior to repair).

1. Baseline inspection and repair activities

The Bryanskblgas pipeline system

Natural gas is typically delivered to customers through a pressurized pipeline. The main transmission pipelines transport millions of cubic meters of gas from gas production sites. The Bryanskoblgas gas distribution system operates pipelines of a medium and low pressure with an annual gas throughput of approximately 2.7 billion cubic meters (bcm). The natural gas distribution system has been operating since 1959.

The supply system covers approximately 15,279 kilometres (km) of pipes, with approximately 6501.34 km of its length located within the cities – and approximately 8777.91 km located outside the city limits. 87.3% of this pipeline are located underground. There are 463 regulator larger points and 1968 smaller scale step-down stations. In total, they contain 15.260 valves and about 45.780 flanges. There are more than half of the large stations are located in the cities, whereas 2/3 of the step-down stations are outside the cities.

There are two main sources of leaks in the Bryanskoblgas network – cracks/breaks in the pipelines as well as components at regulator and step-down stations, most notably valve stem packing. As cracks and breaks occur randomly, the one primary and systematic method to control leakages at regulator and step-down stations, location and number of which are well known. As it is extremely cost-ineffective to survey every meter of the wrapped pipeline of 15,279 km to pinpoint breaks and cracks the only alternative for reducing methane losses is to carry out a more systematic survey monitoring valves and flanges. Reduction of losses at these points will substantially contribute to the total reduction in GHG emissions.

Leak detection and repair

Survey of all valves and flanges within the city limits constitutes the part of the Bryanskoblgas routine maintenance for leak detection. Leaks can be detected within the city limits because of the odour and/or knowledge of some activity that would cause leakage (as with some type of construction or accident etc). Approximately 35% of the valves and flanges are located in the city of Bryansk. Valves and flanges located within the city should be checked once a month according to industry standards (No. 153-39.3-051-2003) and at least once every six months if components are located outside the city. Due to resource constraints, however, this frequency might not be always achieved. Therefore, the portion of valves and flanges that leak outside the city is likely higher than in the city. Prior to the first leak rate measurements done in September- October 2006 no reliable estimates of leak rates have been performed.

Repair material

The main material that is used at valves is a gas pipeline packing consisting of a round twisted cord made of flax sodden with oil, graphite and asbestos. The filling (oil, graphite and asbestos) is about 35% - 60% of total cord weight. The material loses containment due to pressure variations and under the influence of weather changing.

The cord is initially elastic as being oil-saturated, and can fill all holes between rod and valve walls. Eventually (about in 1-2 months) the cord dries out but it is still vapour-proof until the rod is adjusted at moments of pressure regulations. Then the packing requires replacing due to loss of its containment property. Elastic oil and gasoline resistant rubber as well as paronite (compressed asbestos gaskets) are used at flanges. The latter is used as a sealing material at the flanges (approximately at 90% of flanges in the system).

Paronite (compressed asbestos gaskets) is also used at the flanges (approximately at 10% of the flanges). The main difference of paronite from elastic oil and gasoline resistant rubber is that this material is more elastic with lesser residual deformation and steadier to weather changing.

2. Estimates of baseline emissions

In order to describe the baseline and the project activity scenarios and analyse why emissions in the baseline scenario would likely exceed emissions in the JI project activity scenarios it is useful to distinguish between two categories of leaks from components:

Category 1: Components where leaks are detected and measured as part of the JI project activity. Under the baseline scenario these components will typically have a cyclical development in leak rates, with rates increasing in response to temperature and pipeline pressure changes (late fall and in the spring). The regular baseline inspections will detect the leaks to repair them afterwards, though usually with only temporary effect.

Category 2: Components where no leaks are detected as part of the JI project activity. Data from the surveys done in September-October 2006 suggest that about 2/3 of all valves covered by the project will belong to this category. They are, as stated in section A and B of the PDD, repaired as part of the JI project activity, despite the absence of detected leaks. These components might have had leaks in the past and leaks might appear in the future in the absence of the JI project activity.

These patterns as schematically presented in can help to understand how the measured leaks and leak reductions (as a result of the project activity) are compared to the actual or “true” leak reductions over the crediting period of the project.

Conservative estimate of emissions reductions

The actual leak reduction cannot be measured for two reasons:

- Detection of leaks are not done continuously but only at certain time intervals as described in the Monitoring Plan (Annex 3)

- Baseline leaks are hypothetical by their nature and cannot be measured.

It is therefore important that the approach taken to calculate baseline and project activity emissions and ensuing emission reductions is conservative (meaning that the calculated emissions reductions are likely lower than the actual ones). The following approach for calculating emission reductions is applied:

Baseline emissions (TBE): Emissions measured before leak repair[4] (measured in volume per minute) multiplied with the number of minutes of the crediting period. This means that the measured baseline leak rate is assumed to stay constant over the crediting period (till end 2012).

Project activity emissions (TPE): Emissions measured after repair[5] (measured in volume per minute). It is expected that few, if any, leaks will be detected after repair (leak rate=0). However for the case that leaks re-emerge the measured leak rates will be considered to remain at the level measured since the day of the most recent previous inspection or repair. This way of calculating emission reductions (TRE=TBE-TPE) is conservative for the following reasons:

Category 1 components typically have baseline leaks that increase and drop as baseline maintenance/repair result in temporary reductions in leak rates (or they may drop temporary as the pressure is reduced in the summer). Baseline repairs concern leakages when leak rates are high (this is how the leaks are detected) whereas repairs in the project in the JI project is done sequentially during the summer period. Therefore, it can be expected that leak rates measured and recorded just prior to JI project repair can be lower than the average leak rate over time for a certain component.

This actual leak reduction cannot be measured for two reasons:

- Detection of leaks are not done continuously but only at certain time intervals as described in the Monitoring Plan (Annex 3)

- Baseline leaks (after the project activity has been implemented) are hypothetical by their nature and cannot be measured.

It is therefore important that the approach taken to calculate baseline and project activity emissions and the ensuing emission reductions is conservative (meaning that the calculated emissions reductions are likely lower than the actual ones). The following approach for calculating emission reductions is applied:

Baseline emissions (BE): Emissions measured before leak repair[6] (measured in volume per minute) multiplied with the number of minutes of the crediting period. This means that the measured baseline leak rate is assumed to stay constant over the crediting period (till end 2012).

Project activity emissions (PE): Emissions measured after repair (measured in volume per minute). It is expected that few, if any, leaks will be detected after repair (leak rate=0). However for the case that leaks re-emerge the measured leak rates will be considered to remain at the level measured since the day of the most recent previous inspection or repair.

This way of calculating emission reductions (RE=BE-PE) is conservative for the following reasons:

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[4] Note that all valves will be repaired

[6] Note that all valves will be repaired

Category 1 components typically have baseline leaks that increase and drop as repairs result in temporary reductions in leak rates (or they may drop temporary as the pressure is reduced in the summer season). Baseline repairs concern leakages when leak rates are high (this is how the leaks are detected) whereas repairs in the project in the JI project is done sequentially during the summer period. Therefore, it can be expected that leak rates measured and recorded just prior to JI project repair can be lower than the average leak rate over time for a certain component.

Category 2 components do not have leaks when inspected and repaired, as part of the JI project activity. It is likely that some of these components have had leaks in the past and might have leaks in the future in the absence of the JI project repair. Since no emission reductions are accounted for these repairs they probably represent a sizable underreporting of actual emissions reductions achieved by the project activity.
In summary, the calculated baseline leaks rates give conservative emission reductions because:

i) the baseline leak rate measurements are done in the summer season when the rates typically are lower
ii) all valves are repaired irrespective of leaks detected hence preventing potential (baseline) leaks that are not accounted for in the calculation of emissions reductions.

Annex 3

MONITORING PLAN

1. Procedures

As described in the PDD, all leaks will be repaired during the first year of project implementation (2006). Subsequently, the monitoring plan will be implemented to ensure that the integrity of the leak repairing is checked annually.

Monitoring for re-emerging leaks

1. Every component repaired under the JI project activity will be given a unique serial number, which will be painted on the component and recorded with a digital photo of the component and number.

2. A record of all information in relation to each repaired component will be stored in a database, including photographs of display indicating leak rates etc. (see below).

3. Every component repaired under the JI project will be inspected by the JI monitoring crew at least once every year (normally in February - April using the catalytic oxidation/thermal conductivity detectors. These inspections will be in addition to routine equipment inspections conducted by Bryanskoblgas.

4. If no re-emerging leak is detected, the JI monitoring crew will take a digital photo of each component (including a time stamp) that shows its serial number and the leak detector readings demonstrating no leak. This digital photo, along with the date, time, serial number of component, and details of the inspection time will be recorded in the database.

5. If there is a re-emerging leak detected, the JI monitoring crew will take a digital photograph of each component that includes its serial number and the leak detector readings, and starts the “Repair of re-emerging leaks” procedures

Note that regular inspection of regulator stations by officials from Bryanskoblgas will also continue. This is another crew than that of JI project activity. This means that regulator stations located in the city of Bryansk shall be checked for leaks once every month, according to Industry Standard OCT 153-39.3-051-2003, and once every six months - for stations located outside the city of Bryansk. In the event that the regular inspection crews detect a leak, they will immediately record a leak and repair it In other words, re-emerging leaks may be identified either through the JI monitoring crew inspections or as part of the routine inspections of regulator stations.

Detailed instructions on what and how to be monitored are presented in Annex 5.

Repair of re-emerging leaks

1. Where a leak has been detected, the JI monitoring crew will use the Hi-Flow Sampler to measure the leakage rate. Leak detection and measurement may not be conducted on the same day, because the Hi-Flow Sampler is not brought out to the sites during inspections for leaks.

2. Each leak will be measured twice with the High-flow Sampler. Both leak rates will be recorded. If the two measurements differ by more than 10% it normally indicates a human error and the measurements

shall be stopped. The measurement crew will change the position and start the test over again. If the two measurements differ by less than 10%, the higher one will be used for the purpose of calculating project emissions.

3. A digital photo will be taken of the component, serial number, and High-Flow Sampler reading.

4. The leak will then be repaired by the JI monitoring crew.

5. Once the leak has been repaired, the component will be inspected again using catalytic oxidation/thermal conductivity detectors to ensure that the repair has been effective. A digital photo (including a time indication) will be taken demonstrating component, its serial number, and the detector readings.

6. All information on these works will be compiled in the database.

The enforcement of Government Regulation No 344 and other new regulation that could affect additionality of the project will be monitored. This will be done by Centergasservice-opt and included in the regular monitoring reports.

2. Management of monitoring

Monitoring crew

Bryanskoblgas has formed a JI monitoring crew trained by Centergasservice-opt, to identify and repair leaks and monitor leaks that have been repaired. The person responsible for the overall monitoring plan implementation and day-to-day operations is to be appointed by Bryanskoblgas authorities.

Centergasservice-opt and Bryanskoblgas are developing detailed instructions and schedules for leak detection, repairs and measurements. The schedules and instructions will be modified and improved based on experiences from early JI project activities. It is the responsibility of JI monitoring crew to control that the performance and timeline of activities to be conducted by the Centergasservice-opt and Bryanskoblgas.

The training of Bryanskoblgas staff already started in 2006. A special training session was organized in July 2006 with participation of Health Consultants.

Calibration

An important part of the use of the Hi-Flow Sampler is to check the proper functioning and calibration of the equipment. Calibration Kits and spare part kits are delivered with Hi-Flow Sampler package purchased for use in Russia. The Hi-Flow Sampler has been certified for use in Russia by the Russian gas industry research institute ‘GiproNiiGas’.

Procedures for checks and calibration of the Hi-Slow sampler follow the procedures defined by the technology provider, including:

- Every day before use the Hi-Flow sampler is being checked using calibration kit consist of two tanks with the standard percentage of methane concentration. In the event of indication of errors (deviation is more than 10%) that Hi-Flow Sampler must be recalibrated.

- Every month the Hi-Flow Sample will be recalibrated with all balloons from calibration kit HPN 0123309-1 and performed by certified staff.

The manufacturer of the leak detector (Heath Gasurveyor series) requires that device should be calibrated at least once every year under normal operating conditions. Bryanskoblgas will institute calibration validity of the detectors at least once every week following the same procedures for the Hi-Flow Sampler.

Monitoring reports, quality assurance and corrective action

Bryanskoblgas will keep Centergasservice-opt and AddGlobe. LLC informed about progress in monitoring and repairs of re-emerging leaks. At the end of the monitoring period (June) draft monitoring report will be submitted for review and approval to the Head of Quality Inspection Service at Bryanskoblgas. Subsequently, Bryanskoblgas will submit the report to Centergasservice-opt for review and comments.

The quality assurance measures include procedures to handle and correct non-conformities in implementation of the Monitoring Plan. In the event that such non-conformities are observed:

- An analysis of the nonconformities and its causes will be carried out immediately.
- The management of Bryanskoblgas will make a decision, in consultation with Centergasservice-opt, on appropriate corrective actions to eliminate the non-conformity and its causes.
- Corrective actions are executed under the supervision of the Head of Quality Inspection Service at Bryanskoblgas, and necessary amendments are made to operational manual etc.
- All relevant information on non-conformities, subsequent analysis and corrective actions are presented in the annual monitoring reports.

3. Data storage

A database, leak and repair data are entered into, is under development and will be fully operational in autumn 2006. This database is developed using the software Excel and has the capacity to store all essential quantitative data, including serial numbers and photographs of all components, dates of monitoring and repairs, results of all monitoring. The data on leak measurements and repairs that were undertaken in September-October 2006 were stored in an Excel workbook (Annex 4). If necessary these data will be integrated into the Access database.

For each component subject to JI project activity repair the database will contain the entire history of leaks, repairs and monitoring according to the principles indicated above. All inessential data in order to calculate the emission reductions - leak rates (in liters per minutes), time (data, hour and minute) when measurements and repairs were done are documented according to the procedures indicated above.

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