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

CONTENTS

SECTION A. General description of the project

A.1. Title of the project:

>>
Utilization of associated petroleum gas at the fields of Companies of TNK-BP Group, Western Siberia.

Sectoral scope:

10. Fugitive emissions from fuels (solids, oil and gas).

Version: 02
Date: 05.05.2012

A.2. Description of the project:

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The project is being realized at the fields located at various oilfields of Khanty-Mansiyskiy Autonomous Okrug, which are under operation of the following oil-producing companies associated with TNK-BP Group including: JSC "Samotlorneftegaz" (SNG); JSC "Varyoganneftegaz" (VNG); JSC "TNK-Nyagan; LLC SP Van'yeganskiy (VN).

The situation before the project
Before 2003 the associated petroleum gas gathered at the fields of above companies (Project fields) was directed to gas processing plants (GPPs) for production of the dry gas and gas liquids (GLs). Historical deliveries of APG totaled about 4.0 mln. Nm^3 per year.

In 2003 the TNK-BP Company was established that united oil and gas assets of the mentioned companies and has begun to extend APG gathering and deliveries to GPPs. Further plans of oil fields development led to expansion of APG production. That put on agenda an issue of APG utilization as it would require substantial investments in expanding infrastructure of APG gathering and transportation. In absence of the economic efficiency of APG gathering activities flaring was an attractive low-cost option that would not require any additional investments.

Project purpose
The project aims at the gathering and transportation for useful utilization of APG, which otherwise would have been burnt at the flares of the field included in the project (Project fields) and, therefore, at reducing greenhouse gas emissions. The TNK-BP Company expects that the sale of emission reduction units (ERU) under the Joint Implementation mechanism of the Kyoto Protocol will improve economic efficiency of the project.

Project description
Having at disposal a significant APG resource, the Project companies of TNK-BP Group took action to increase its useful utilization level.

For this purpose the following activities have been/are implemented within 2003-2012:

- Introduction of units of additional separation (UADs);
- Construction of new gas pipelines and rehabilitation of old ones;
- Introduction of compression stations (CS) and vacuum compressor stations (VCS);

- Introduction of gas metering and reducing units etc.

More detailed information on the project activities is presented in the subsection A.4.2.
Thus, these measures will allow capturing increased APG volumes (additional APG) and directing them into expanded TNK-BP gas transportation system. In turn, APG flaring will be reduced that will lead to prevention of CO_2 and CH_4 emissions.

Baseline scenario
Under the baseline scenario all APG recovered due to Project activities would have been flared at the fields that would lead to considerable emissions of GHG gases including CO2 и CH4 (as a result of incomplete flare combustion). Continuation of flaring under this scenario is determined by the lack of sufficient incentives for implementation of a APG utilization project, which is confirmed by the following facts:

- At the time of decision-making sectoral policies and legislation did not provide real mechanisms for efficient APG utilization;
- Considerable capital expenditures for establishing APG utilization infrastructure and low APG costs and hence,
- Lack of investment attractiveness of these project types.

Project history:
2003. Initiation of the Project. The situation with utilization of additional volumes of APG that were to emerge due to expansion plans of oil production was considered by the management of TNK-BP Company. Utilization of additional APG required considerable reconstruction and extension of existing APG capture and transportation system. In turn, that required considerable investments. As was indicated in the memo the results of estimates of economic efficiency of investment attractiveness are poor with the negative NPV and payback period over 47 years. To secure the economic feasibility to the project activities directed to utilization of additional APG volumes it was decided to use JI mechanism of Kyoto protocol.
2005. Due to Kyoto Protocol entering into force TNK-BP Company decided to actualize the estimates of emission reductions due to Project realization. Further steps on Project implementation as a JI project, including JI PDD elaboration and determination might be addressed after adoption of JI procedures in Russian Federation.
2007. In the beginning of the year the national JI procedure had not still been in place, therefore the Company decided that elaboration of the full-scale PDD for the whole Project was not expedient due to considerable transaction costs. Therefore it was decided to prepare PDD for a smaller pilot projects that included construction of 5 vacuum compressor stations at oil fields of in JSC “SNG” and APG utilization at Verhtarskoye oil field. Addressing the issue of PDD development for whole Project would be after adoption of the national JI procedure.
2009 As a result of the tender a short list of contractors to conduct further negotiations for the sale of ERUs to be generated in 2008-2012 due to the Project was approved.
2011 The consulting company informed TNK-BP of the completion of PDD development. It was decided to check data provided in PDD and to organize a determination process.

Emission reductions
As a result of the project activity the APG that otherwise would be flared will be efficiently utilized. It is more than 22,7 billion Nm^3 of APG will be utilized in 2008-2012. That will result in a considerable amount of GHG emission reductions. Estimated GHG emission reductions are more than 61 million tons of CO2 equivalent during this period.

A.3. **Project participants:**

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A.4. Technical description of the project:

A.4.1. Location of the project:

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A.4.1.1. Host Party(ies):

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Russian Federation

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

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The project is being realized in Khanty-Mansiyskiy Autonomous Okrug (KhMAO) Tyumen oblast, which is a subject of the Russian Federation.

Administrative center is the city of Khanty-Mansiysk. Major cities are Surgut, Nizhnevartovsk, Nefteyugansk, Nyagan. It borders Yamalo-Nenetskiy Autonomous Okrug, Krasnoyarskiy region, Tomskaya oblast, south of Tyumen oblast, Sverdlovskaya oblast and Komi Republic.

The population of KhMAO is 1 538 000 people.

Figure. A 4.1.2. Khanty-Mansiyskiy Autonomous Okrug on the map of Russian Federation

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

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The project is being realized at the fields located at various oilfields of Khanty-Mansiyskiy Autonomous Okrug, which are under operation of the following oil-producing companies associated with TNK-BP Group including:

#	Company	Field/License Area
1.	JSC "Samotlorneftegaz" (SNG)	Samotlorskiy
2.	JSC"Varyoganneftegaz" (VNG)	North Var'yoganskiy
		Bakhilovskiy
		Verkne-Kolik-Yeganskiy
		Norh-Khokhryakovskiy
3.	JSC "TNK-Nyagan"	Talinskiy
		Yem-Yegovskiy

		Kamennyy
4.	LLC SP Van'yeganskiy (VN)	I-Yeganskiy
		Van-Yeganskiy

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

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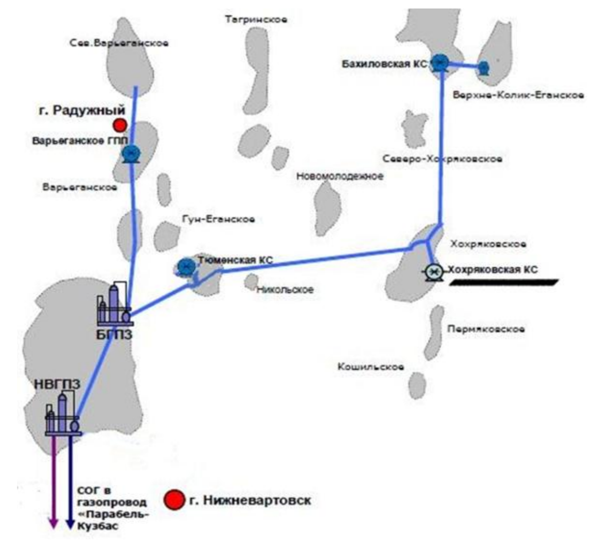
Figure. A.4.1.4. Schematic diagram of the project activity



Project APG from the outlet of separation unit is directed for prior compression at a booster compressor station BCS and further transported to the main CS. From the exit of CS APG under high pressure is supplied via newly constructed gas pipelines for efficient utilization at gas processing plants or at power generating units.
On a left figure a diagram of TNK BP gas transportation system in Nizhnevartovsk rayon is provided which is a typical technological scheme of delivery of APG for utilization. In administrative terms the fields are located in Khanty-Mansiyskiy Autonomous district of Tyumenskaya oblast

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

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APG flows

The basis for determination of greenhouse gas emission reductions is the *additional volume* of associated gas, which is defined as the difference between the total volume recovered during the period and the amount of associated gas, which has been utilized before the Project realization, the so-called *historical volume* of associated gas. The volume of utilization of additional APG, provided for the implementation of this project is approximately 26 billion m3 in the period of 2008-2012. This volume is formed by summing the additional volume of utilized APG by subsidiaries of TNK-BP included in the project:

SNG

Item	Units	2008	2009	2010	2011	2012
Delivery in GPP	Mln m3	4527	5277	5375	5380	5175
Historical APG	Mln m3	2111	2111	2111	2111	2111
Additional APG	**Mln m3**	**2416**	**3166**	**3264**	**3269**	**3064**

TNK-Nyagan

Item	Units	2008	2009	2010	2011	2012
Delivery in GPP	Mln m3	839	934	994	994	1127
Historical APG	Mln m3	495	495	495	495	495

Additional APG	**Mln m3**	**344**	**440**	**499**	**499**	**633**

VN

Item	Units	2008	2009	2010	2011	2012
Delivery in GPP	Mln m3	280	472	610	883	932
Historical APG	Mln m3	574,55	574,55	574,55	574,55	574,55
Additional APG	**Mln m3**	**0**	**0**	**36**	**309**	**357**

VNG

Item	Units	2008	2009	2010	2011	2012
Delivery in GPP	Mln m3	1216	1139	1323	1511	1989
Historical APG	Mln m3	619	619	619	619	619
Additional APG	**Mln m3**	**597**	**520**	**704**	**892**	**1370**

Historical APG

To provide conservatism the level of APG historical volume is defined as the maximum value of APG delivered in 2000-2003, before the start of the Project in February 2004. For SNG and TNK-Nyagan these values are equal to 2011 mln. m3 and 495 mln. m3 respectively.

For VN and VNG companies TNK-BP does not dispose data of APG utilization for that period. Therefore, historical APG volumes for these companies are defined as there were in 2003: 574,55 mln m3 for VN and 619,07 mln m3 for VNG.

Company	Units	2000	2001	2002	2003
SNG	Mln m3	1756,989	1960,221	1356,199	2111,171
TNK-Nyagan	Mln m3	-	-	-	494,754
VN	Mln m3	-	-	-	574,55
VNG	Mln m3	-	-	-	619,066

Utilization of additional volumes of APG was made possible due to implementation of whole complex of measures under Project directed at expansion of gas transport infrastructure for the period of 2004-2012. Schedule of implementation of these measures is presented at the tables below:

Project activities in 2004

SNG	VNG	TNK-Nyagan	VN
Low pressure gas pipeline from CTP –NV GPP	Gas pipeline of CS Bakhilovskaya – BPS at Verkhne-Kolik-Yegan oilfield	Reconstruction of BPS-5 Reconstruction of BPS-30	-
Low pressure gas pipeline BPS-39 - KSP – 5	-	Reconstruction of BPS-2 at Yom-Yogov oilfield	-
Reconstruction of the unit of additional separation (UDS-4) Total capacity 300 ths. Nm3/h.	-	Reconstruction of BPS-1 at Talinskoye oilfield.	-

	-	Reconstruction of CTP "Krasnoleninskiy" UPN - 2	-
	-	Reconstruction of CTP "Krasnoleninskiy" UPN - 1	-
	-	Reconstruction of CPS "Yzhniy" UPN-2	-

Project activities in 2005

SNG	VNG	TNK-Nyagan	VN
Reconstruction of the unit of additional separation (UDS-1) Total capacity 200 ths. Nm3/h.		Reconstruction of CTP UPN-2	Gas pipeline from BPS-2 to Van-Yegan CPS
Low pressure gas pipeline BPS-1 - BPS-2		Reconstruction of BPS-9 of Talinskoye oilfield	-
Reconstruction of low pressure gas pipeline KSP-3 –BPS-2	-	Reconstruction of BPS-5	-
Compression unit TAKAT 50-07	-	Reconstruction of BPS-30	-

Project activities in 2006

SNG	VNG	TNK-Nyagan	VN
Gas pipeline KSP-23-KSP-6	Gas pipeline BPS-1 North-Khokh-ryakovskoye oilfield - Bakhilov CS	Reconstruction of BPS-4	Construction of gas-piston power station at CPS
Low pressure gas pipeline BPS-19-cut-in point	Gas pipeline BPS 2- cut-in point; BPS-1 – VCS 1,2	Reconstruction of DNU-9	-
Low pressure gas pipeline KSP-9-cut-in point	Compression station at Verkhne-Kolik-Yegan oilfield	Reconstruction of BPS-30	-
		Reconstruction of DNU-1	
		Reconstruction of BPS 32. Talinskoye oilfield.	
		Reconstruction of gas pipeline BPS24- valve unit 10	
		Reconstruction of gas pipeline BPS-12 – cut-in point 20	

		Reconstruction of DNU-1 (Installation of preliminary water discharge - IPWD), Kamennoye oilfield	
		Reconstruction of boiler-house at DNU-1, Kamennoye oilfield	
		Construction of substation 110/35/6 кВ	
		Reconstruction of BPS-4	

Project activities in 2007

SNG	VNG	TNK-Nyagan	VN
Low pressure gas pipeline KSP-16-Belozerny GPZ	Vacuum compression station at North Khokhryakovskoye oilfield	Reconstruction of gas pipeline BPS-27 – BPS 24	-
Low pressure gas pipeline BPS-32-BPS-24	Vacuum compressor station (ShFLU) at Verkhne-Kolil-Yegan oilfield	Reconstruction of BPS-4	-
Low pressure gas pipeline KSP-10 – KSP-16	CS Bakhilovskaya	Reconstruction of BPS 32	-
-	Gas pipeline BPS-1 North-Khokh-ryakovskoye oilfield - Bakhilov CS	Reconstruction of BPS 17-cut-in point 12	-
		Reconstruction of gas pipeline BPS-24 – crane unit	
		Reconstruction of boiler-house of BPS-10	

Project activities in 2008

SNG	VNG	TNK-Nyagan	VN
Reconstruction of the unit of additional separation (UDS-2) with capacity of 300 ths. Nm3/h.	CS Bakhilovskaya	Reconstruction of gas pipeline BPS 27 (crane unit 19) – BPS 24 (crane unit 17)	Vacuum CS at BPS
Low pressure gas pipeline KSP-10-KSP-16	Vacuum compression station at North Khokhryakovskoye oilfield	Reconstruction of BPS-3	Bloc-box of VCS at BPS
Low pressure gas pipeline KSP-16-Belozerny GPZ	Gas pipeline BPS-1 North-Khokh-ryakovskoye oilfield - Bakhilov CS	Reconstruction of CTP "Krasnoleninskiy"	-
Low pressure gas pipeline		Reconstruction of gas	

BPS-14- KSP-9		pipeline BPS 27 – crane unit 19	
Low pressure gas pipeline BPS-33-KSP-23		Reconstruction of gas pipeline BPS 24 (crane unit 19) – crane unit 10	

Project activities in 2009

SNG	VNG	TNK-Nyagan	VN
Low pressure gas pipeline KSP-10-KSP-16	Vacuum Compressor Station at Verkhne-Kolik-Yegan oilfield	Reconstruction of gas pipeline BPS 27 – BPS 24	-
Low pressure gas pipeline KSP-16-Belozerny GPZ	Bakhilovskaya CS	Reconstruction of BPS-24	-
Gas pressure CPS Yershovoye – Belozerniy GPZ	Gas pipeline BPS-1 North-Khokh-ryakovskoye oilfield - Bakhilov CS	Modernization of 3 furnaces PTB at Yuzhniy CPP	-
Technical retooling of gas pipeline KSP-14 – Belozerniy GPZ		Reconstruction of Talinskiy CPP	-
Gas pipeline KSP-5-KSP-6		Reconstruction of boiler-house CTP	
		Reconstruction of BPS-27	
		Reconstruction of IPWD BPS-1	
		Reconstruction of gas condensate gathering unit	

Project activities in 2010

SNG	VNG	TNK-Nyagan	VN
Reconstruction of UDS-2	Bakhilovskaya CS	Reconstruction of gas pipeline BPS 28 (cut-in point 31A) – BPS 27 (cut-in point 1)	-
Low pressure gas pipeline BPS-1 - BPS-2 (UDS-1)	Gas pipeline BPS-1 North-Khokh-ryakovskoye oilfield - Bakhilov CS	Reconstruction of BPS 24	-

Low pressure Gas pipeline BPS 1- BPS 2 (UDS-1) Connection to BPS-28.	VCS with ShFLU at Verkhne-Kolik Yegan oilfield	Reconstruction of gas pipeline Yuzhniy CPP – cut-in point 3	-
	Gas pipeline construction CS Bakhilovskaya – BPS Verhne-Kolik-Yegan oil field.	Reconstruction of BPS-27	-
		Reconstruction of IPWD BPS 1	
		Gas pipeline BPS-2 – Krasnoleninsiy CTP	
		Gas power station (Ist stage)	

Project activities in 2011

SNG	VNG	TNK-Nyagan	VN
Low pressure gas pipeline KSP-16-Belozerniy GPZ	VCS with ShFLU at Verkhne-Kolik-Yegan oilfield	Reconstruction of gas pipeline BPS-2 - BPS-3	-
Low pressure gas pipeline BPS-1 – BPS-2 (UDS-1)	Gas pipeline section BPS of Verkhne-Kolik-Yegan pipeline – CS Bakhilovskaya ÷	Reconstruction of gas pipeline of BPS 9	-
Gas measuring point	Verkhne-Kolik ---- Yeganskoye field construction. Reconstruction of gas-pipeline BPS-1-CS Bakhilovskaya	Reconstruction of gas pipeline BPS-2 – cut-in point BPS-2.	-
		Reconstruction of BPS-24	
		Reconstruction of BPS-9, BPS-10	
		Reconstruction of gas pipeline BPS-30 – BPS 28	
		Reconstruction of gas pipeline Yuzhniy CPP – cut-in point 3	
		Reconstruction of gas pipeline BPS-5 - BPS 31	
		Reconstruction of gas pipeline BPS-32 – cut-in	

		point 33	
		Gas pipeline BPS-2 - CTP	
		Reconstruction of boiler-house at Yuzhniy CPP	
		Construction of 24 MW gas turbine power plant (GTPP-1)	
		Construction of 48 MW gas turbine turbine power plant (GTPP-2)	
		Reconstruction of gas pipeline BPS-9 – crane unit # 13	

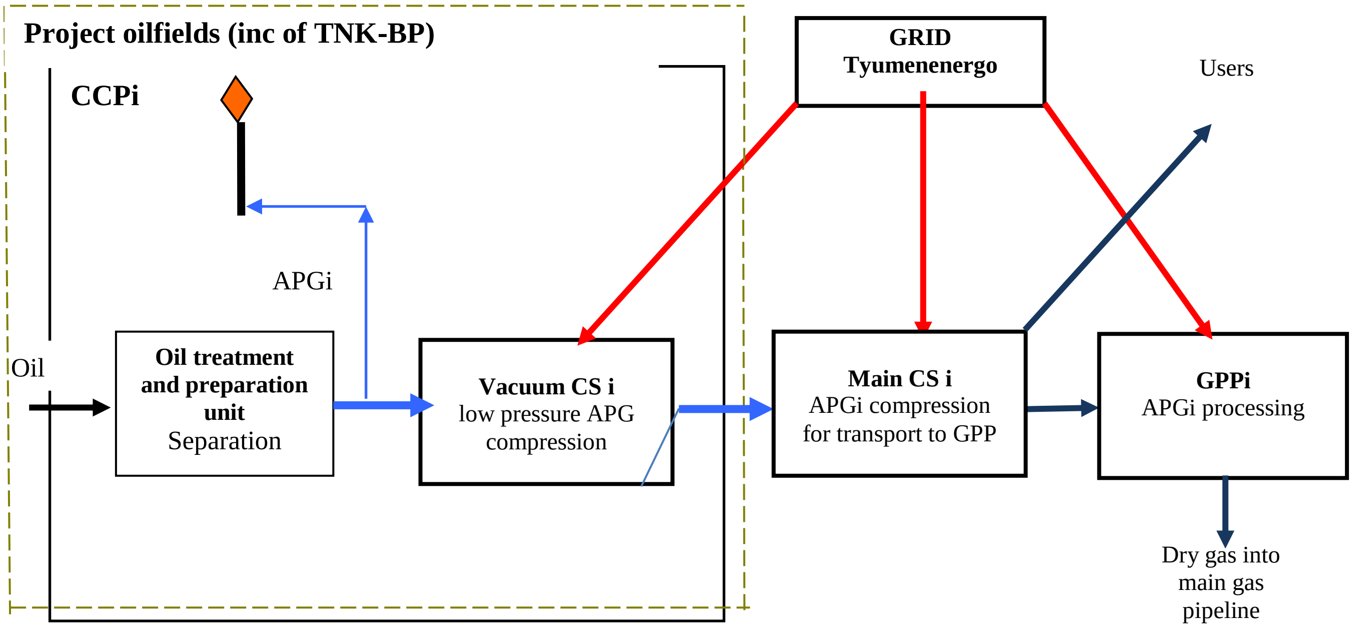
Project activities in 2012

SNG	VNG	TNK-Nyagan	VN
Low pressure gas pipeline KSP-16-Belozerniy GPZ	APG fuelled power station at Verkhne-Kolik-Yegan oilfield	-	-
Low pressure gas pipeline. Bypass between UDS-14 and gas pipeline UDS-4-KSP-5.	VCS for compressing APG of low separation stages at Verkhne-Kolik-Yegan oilfield	-	-
	Verkhne-Kolik ---- Yeganskoye field construction. Reconstruction of gas-pipeline BPS-1-CS Bakhilovskaya	-	-
	Gas pipeline BPS of Verkhne-Kolik-Yegan field – CS Bakhilovskaya	-	-

APG gathering and transportation for utilization

During the oil preparation at central collection points (CCP), booster pump units (BPS) or units of additional separation (UAS) the high-pressure associated petroleum gas (APG) with the pressure of 4.5 atm is released from crude oil transported from the oilfields. This gas from the first separation stage is directed to the main CS at once, while APG from the second stage of separation with the pressure of 0.5 atm is fed to vacuum compressor stations (VCS) to increase pressure to be transported the main CS. Being compressed at the pressure of 58 atm, the total APG flow is directed from CS into gas pipeline with further deliveries to gas processing plants. At GPPs APG is processed with the yield of a dry gas and gas liquids (GLs). Further on, at GPPs output the dry gas is supplied under high pressure to the main gas pipeline JSC «Gazprom» for delivery to consumers. GLs are delivered for further processing at the Tobol Oil Chemical Works of SIBUR. Thus, collecting, compressing and supplying APG to the gas pipeline will prevent APG flaring and allow, thus, to reduce greenhouse gas emissions, including CO_2 (carbon dioxide) and CH_4 (methane). The gas pipeline constructed under the project and transporting APG to the infield pipeline network is equipped with cranes and switching nodes of gas flows. Electricity for pipeline control valves is not consumed. Compressors at CS are activated by electric drives, which use electricity from the external grid. Compressors provide required pressure for APG transportation through gas pipelines up to GPPs. Graphically the APG utilization scheme is provided below.

Figure A.4.2. APG utilization scheme



○	Monitoring points	→ (black arrow)	Crude oil flow
(flare symbol)	APG flaring	→ (blue arrow)	APG flow on new gas pipeline
Vacuum CS	Compressor station		
CCP	Central collection point		

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:

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Under the project activity the significant volume of extracted APG that in the absence of the Project would be flared is efficiently used through compression and injection into the gas pipeline and further transportation to the GPPs for the treatment with the yield of the dry stripped gas and for compressing it into the main gas pipeline. This will prevent the CO2 and CH4 emissions, which would have been under the baseline scenario in the case of flaring this APG volume on the flare. In the absence of the project activity it would be impossible to reach the mentioned reductions as the national sectoral policies and economic situation in the oil&gas industry do not ensure real mechanisms for efficient APG utilization:

In Russia, the laws and resolutions designed to regulate the APG use did not enforce oil companies to minimize flaring. In fact, if the utilization is economically infeasible APG may be uselessly flared. At the same time, the waste of the natural resource has to be compensated with environmental payments in the various budgets and with provision of polluting substances in surface layer of air below the maximum allowable concentration level. Even a 95% APG efficient utilization requirement introduced in some license agreements could not prevent its flaring. According to information provided in such reliable sources as Vedomosti and Reuters, in 2009 APG flaring in the Russian Federation rose up to 64.3%[1] as compared with 24.4%[2] in 2006. It testifies for the insufficient enforcement of this requirement that cannot motivate the oil company to efficiently utilize APG. On the other hand, the oil companies are extremely reluctant to implement construction of APG collecting and transport infrastructure as due to huge financial expenditures, low APG prices, uncertainty and non-transparency with access to the gas transmission system such a kind of projects represent the considerable investment risk.

This argumentation provided in B section in the greater detail evidences that reduction of APG flaring and, hence, of GHG emissions is only possible under the proposed project activity.

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

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	Years
Length of the crediting period	5
Year	Estimate of annual emission reductions in tonnes of CO_2equivalent
2008	9 293 337
2009	11 385 799
2010	12 506 084
2011	13 771 304
2012	14 860 069
Total estimated emission reductions over the crediting period (tonnes of CO_2 equivalent)	**61 816 593**
Annual average of emission reductions over the crediting period (tonnes of CO_2 equivalent)	12 363 319

[1] http://www.lenta.ru/news/2010/03/22/gas/

[2] http://ru.reuters.com/article/idRUANT32989120080213

A.5. Project approval by the Parties involved:

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On September 15, 2011 the Chairman of the Russian Federation Government signed Resolution 740 "On measures for realization of Article 6 of the Kyoto Protocol to the United Nations Framework Convention on Climate Change". This document depicts a JI-project approval procedure in the Russian Federation.

According to item 4 of the Provision the approval of projects will be carried out by the Ministry of Economic Development of the Russian Federation based on consideration of submitted project proposals. Competitive selection of demands is carried out by the operator of carbon units (Sberbank of RF) according to the item 10 of the Government Decree of the Russian Federation № 780.
According to item 7 of the Provision the application structure includes «the positive expert opinion on the project design documentation prepared according to the international requirements by the accredited independent entity chosen by the applicant».

Thus, according to the legislation of the Russian Federation in the field of JI projects realization, the Project approval is possible after reception of the positive determination opinion from AIE.

SECTION B. Baseline

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

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Description and justification of the baseline chosen will be provided based on provisions of Guidelines for users of the JI PDD form (version 04) and in accordance with appendix B of the JI guidelines and the "Guidance on criteria for baseline setting and monitoring" using the following JI-specific step-wise approach::

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

Step. 2. Application of the approach chosen.

The following is a detailed presentation of the two steps:

Step. 1. Indication and Description of the Approach Chosen Regarding the Baseline Setting

The baseline is determined through considerations of various alternative scenarios with regard to the proposed project activity. As criteria for choosing the baseline scenario the key factors will be determined. All alternatives will be considered in terms of influence on them of these factors. The alternative scenario, which is the least negatively influenced by the key factors, will be chosen as the baseline.

Therefore, the following stages of determining the baseline scenarios are envisaged:

a) *Description of alternative scenarios.*
b) *Description of the key factors.*
c) *Choosing the most plausible alternative scenario.*

Step. 2. Application of the Scenario Chosen

As alternatives the following two scenarios are considered:
Alternative scenario 1. Continuation of common practice for utilization of APG, i.e. the combustion of the extracted APG in the flare of TNK-BP companies in Western Siberia.

Alternative scenario 2. The project itself (without being registered as a JI activity) that is efficient utilization of APG, i.e. expansion of TNK-BP gas transport system for delivery of additional APG volumes for processing.

None of the alternatives contradict the current legislation and may be discussed in the further analysis.

The analysis also not consider variants related to the injection of APG to reservoir pressure maintenance as TNK-BP companies use water for reservoir pressure maintenance at their oilfields. The analysis also does not consider variants related to the primary processing of APG on-sites and the production of methanol, due to lack of potential customers near the oilfields well as a significant remoteness of transport infrastructure.

a) *Description of alternative scenarios.*

Alternative scenario 1. Continuation of common practice for utilization of APG, i.e. the combustion of the extracted APG in the flare of TNK-BP companies in Western Siberia.

TNK-BP companies are producing oil and gas at their oilfields in Western Siberia. The additional volumes of APG that are gathered and transported for utilization are flared. This situation leads to significant GHG into the atmosphere. The APG volumes that would be flared under this scenario are presented in the following table:

Table B.1.1. APG to be flared at oilfields in 2008-2012

Item	Unit	2008	2009	2010	2011	2012
Additional APG	ths. m^3	3 357	4 126	4 502	4 969	5 425

Under environmental legislation an enterprise is required to calculate the quantities of polluting emissions including methane, carbon oxide, nitrogen oxides etc. and to make quarterly environmental payments according to norms set by Russian Government’s Decree № 344 dd. 12/06/2003 and revised by Decree № 410 dd. 01/07/2005. The latest revision was made on 08.01.2009 with accepting Resolution N 7 that provides for increased penalties for APG flaring below the target indicator of 95% utilization rate. According to the Resolution the enhanced coefficient (4.5) shall be applied to the fee for the methane emissions from combustion of the APG volume, which is equal to difference between total APG and target indicator (considering 95% utilization rate). Remainder 5% shall be paid with a normal fee.

Under the scenario, approximately 77800 ths.m3 of methane a year would be emitted in the atmosphere from 2012. In this case environmental payments would be about 61 million roubles a year or 551 million roubles for the period 2012-2020.

In below table the estimation of environmental payments to be made by TNK BP Company for APG flaring from 2012 on according Resolution # 7 is made.

Table B 1.3 Calculations of environmental payments for the APG flaring at CPS of project oilfields.

	CH4 volume into the atmosphere as the result of the incomplete burning	Coefficient (governmental regulation № 7 8 January 2009)	Payment rate for above-limit CH4 emissions (governmental regulation №344 12 June 2009) [3]	Share of CH4 subject to application of coefficient and payment rate as per columns 3 and 4	Amount of environmental payments
1	*2*	*3*	*4*	*5*	*6*
	ths m3		*ruble/tonnes*	*%*	*mln rub/ year*
2012	76919	4,5	250	95	60574
2013	77990				61417
2014	77990				61417
2015	77990				61417
2016	77990				61417
2017	77990				61417
2018	77990				61417
2019	77990				61417
2020	77990				61417
	700835				551908

[3] http://government.consultant.ru/doc.asp?ID=17975&PSC=1&PT=1&Page=1

Alternative scenario 2. The project itself (without being registered as a JI activity) that is efficient utilization of APG, i.e. expansion of TNK-BP gas transport system for delivery of additional APG volumes for processing.

Implementation of this Scenario prevents the CO2 and CH4 emissions, which would have been under the scenario 1 in the case of flaring this APG volume in the CCP flares. A newly-built gas pipelines and reconstructed ones and VCS provide collecting and APG transportation from Project oilfields for processing at GPPs, which are located outside the project boundary.

At GPPs (Nizhnevartovskiy, Beloozerniy, Krasnoleninskiy) APG is processed with the yield of dry gas and gas liquids (GLs). Further dry gas is supplied under high pressure to main gas pipeline. GLs undergo through further deep processing with the subsequent delivery to consumers as target components.

Dry gas replaces fossil fuels consumption such as natural gas, fuel oil, petrol etc. Therefore, this project is resource-saving activities which will not lead to, but will avoid, the recovery and consumption of additional fossil fuel (conservatively of the natural gas as the least carbon-intensive fuel).

APG flows delivered from the Project oilfields for utilization is presented on the following scheme:

Table B 1.2 APG flows

Item	2008	2009	2010	2011	2012
APG deliveries in GPP, Mln. m^3	6863	7822	8302	8768	9224
Historical APG , Mln. m^3	3800	3800	3800	3800	3800
Additional APG, Mln. m^3	3 357	4 126	4 502	4 969	5 425

To implement this alternative scenario it was required to invest 16740 million rubles.

b) Description of the key factors

A baseline shall be established taking into account relevant national and/or sectoral policies and circumstances, such as sectoral reform initiatives, legislation, the economic situation in the project sector etc. The following key factors that affect a baseline shall be taken into account, e.g.:

- Sectoral reform policies and legislation;
- Economic situation in oil&gas sector in terms of APG utilization;
- Availability of capital (including investment barrier);
- APG prices.

c) Analysis of the influence of the key factors on the alternatives

Further on the detailed consideration of each alternative taking into account the key factors is provided.

Sectoral reform policies and legislation

State sectoral policy in the field of APG utilization lacks clear balanced mechanisms allowing to implement, to monitor and to enforce APG efficient utilization requirements. Regulation of APG utilization issues is carried out by following normative –legal documents:

- Federal Law «On subsoils» # 2395 dd. 21.02. 1992.
- Resolution of Supreme Council of Russian Federation # 3314.1 dd. 15.06.1992 "On procedure of introduction into operation of Regulation on subsoil licensing procedure".
- Law of Khanty Mansi autonomous okrug (KhMAO) # 15.03 dd. 18.04.1996"On subsoil use".
- Resolution of the Government of Russian Federation dd. 12.06.2003 # 344 "On norms of payments for polluting emissions into the atmosphere by stationary and mobile sources, for discharges of polluting substances in surface and subsurface water objects and for disposal of production and consumption wastes".
- Resolution of the Government of Russian Federation dd. 01.06.2005 # 410 "On introduction of deviations in the appendix 1" of Resolution dd. 12.06.2003 # 344 ".
- Resolution of the Government of Russian Federation dd. 08.01.2009 # 7 "On measures on stimulation of polluting atmosphere air reduction by products of associated petroleum gas combustion at flare stacks".

All these legislative documents do not enforce companies to minimize gas flaring. They define environmental payments for consumption of natural resources and the sanitary quality norm of atmosphere air expressed through maximum allowable concentration (MAC) of polluting substance in the ambient air. In fact, the real point of these documents is that if utilization is economically infeasible APG may be uselessly flared. At the same time, the waste of the natural resource has to be compensated with environmental payments in the various budgets and with provision of polluting substances in surface layer of air below MAC-level.

Thus, neither sectoral reforms nor legislation make the companies directly reduce APG flaring and do not motivate to utilize APG. Appropriately, the key factor favors continuation of APG flaring under Scenario 1. On the contrary, implementation of Scenario 2 is not provided under the influence of this factor.

Economic situation in the oil&gas sector in terms of APG utilization

Efficient utilization of APG has always been a burden for oil companies in Russia because there have been many uncertainties and problems on this way that turned realization of this resource saving activity into the difficult-to-implement task.

First of all, many oil companies face with the premature fall of long-run recovery forecasts due to imperfection of reliable geological forecasting and of instrumental metering of resources to be recovered. That creates uncertainty with regard to how much oil and APG will be extracted and used in the near term.

Secondly, the facilities for the utilization of the APG are usually not integrated in the oil field production schemes. As a rule, there is no developed APG treatment and transportation infrastructure in areas of hydrocarbon recovery. APG utilization is carried out relatively well on sites with infrastructure that was built in the Soviet era of 70s-80s of the last century and was financed from the state budget. Therefore, APG utilization projects imply a construction of the new infrastructure for collection, treatment, and transport of the APG and require high investment costs that may bring inadequate returns for the oil companies. This is due to low APG prices for remote oil fields with long distances to the gas processing facilities or consumption markets.

Thirdly, the oil companies also face structural barriers such as limited access to the existing gas processing and transmission infrastructure. The Russian market of gas transportation and processing is highly monopolized by JSC "Gazprom" and JSC "Sibur". When organizing access to trunk gas pipeline system the natural gas is getting a priority over APG. This is due to the fact that the gas market is formed under the influence of the natural gas as it requires lesser (comparatively with APG) recovery and connection-to-pipeline costs. Besides, low marketability of APG is explained by the quality of its treatment as the stripped gas does not always meets the gas pipeline acceptance standards. This situation hampers the equal access for the oil companies coming in with APG to trunk gas pipeline system and gas processing plants. Neither Gazprom nor Sibur are economically accountable to the State and the oil companies for groundless refusal in accepting APG for processing and transmission or for breach of obligation for reporting APG at recovery, processing and transmission. This circumstance do not favors the fulfillment of APG utilization requirement as stipulated in the license agreement.

The adverse conditions of APG utilization described above are also applicable to Scenario 2. TNK-BP companies expand gas transport infrastructure investing considerable capital funds. Too low APG prices which the companies had to sell it for cannot provide the profitability for this project as NPV is negative (see B2 section). TNK-BP Company expects that ERUs sales could help improving project economics.

Therefore, this factor unfavorably effects realization of Scenario 2 making thus Scenario 1 be a most plausible alternative for the baseline.

Availability of capital (including investment barrier)

For Scenario 1 no investment capital is required. Nevertheless, APG flaring necessitates making environmental payments. The source of funding for these payments is included in the production cost of oil recovered under the routine activity of the Company.

Despite the Company raised the large financial resources in amount of 16,7 billion rubles to construct the new gas pipeline and CS, the project represents a considerable financial risk due to the low economic efficiency (see Section B2 for details). In common typical investment practice the funds are available for a profitable commercial activity but not for the projects with negative NPV. Therefore the obvious investment barrier exists for Scenario 2.

APG prices

Price APG applied in investment analysis for this project is about 566 rubles / thousand. m3 in the first years, and almost 1,752 rubles / thousand. m3 in the next, which is equal to the price of natural gas, and that not all the same provides a return on investment (see section B2).

As the project’s profitability depends on the APG price the Scenario 2 is highly vulnerable to the influence of this factor.

d) Choosing the most plausible alternative scenario.

To summarize considerations above the influence of the factors on each scenario is expressed through the factor analysis in the following table.

Table B.1.5. Factor analysis

№	Factor	Scenario 1	Scenario 2
1.	Sectoral reform policies and legislation	Favors to implementation	Does not provide implementation
2.	Economic situation in the oil&gas sector in terms of APG utilization	Makes this scenario the most plausible candidate for baseline	Unfavorably effects on its realization

3.	Availability of capital (including investment barrier)	No influence	Represents investment barrier for this scenario
4.	APG prices	No influence	Makes the project unprofitable due to low APG price

Based on the conducted analysis it is quite obvious that the key factors favor the implementation of Scenario 1 and affect negatively Scenario 2. Therefore, Scenario 1, that is *Continuation of common practice for utilization of APG, i.e. the combustion of the extracted APG in the flare of TNK-BP companies in Western Siberia* is the baseline scenario.

The key information and data used to establish the baseline:

Data/Parameter	**$FC_{hisAPG\ max}$**
Data unit	ths m^3 (under standard conditions)
Description	Maximum volume of historical utilized APG in old pipeline infrastructure at TNK-BP companies' oilfields
Time of determination/monitoring	constant
Source of data (to be) used	APG annual technical reports
Value of data applied (for ex-ante calculations/determinations)	Company / Units / 2003: SNG / mln.m3 / 2 111 TNK-Nyagan / mln m3 / 495 VN / mln m3 / 575 VNG / mln m3 / 619
Justification of the choice of data or description of measurement methods and procedures (to be) applied	APG historical volume is needed for baseline emissions calculation.
QC/QA procedures (to be) applied	Reference data based on actual data of APG recovered in utilized for period 2000-2003. As the historical value a maximal value of APG utilized within 2000-2003 is accepted. The maximal historical value corresponds to the APG volume gathered and transported by the project companies of TNK-BP for utilization in 2003.
Any comment	-

Data/Parameter	Global Warming Potential of Methane (GWP CH_4)
Data unit	tCO_2e/tCH_4.
Description	GWP CH_4 is necessary to calculate the CH_4 emission factor due to APG flaring
Time of determination/monitoring	Once, during determination
Source of data (to be) used	Decision 2/CP.3 http://unfccc.int/resource/docs/cop3/07a01.pdf#page=31 Climate Change 1995, The Science of Climate Change: Summary for Policymakers and Technical Summary of the Working Group I Report, page 22. http://unfccc.int/ghg_data/items/3825.php

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	GWP CH_4 is necessary to calculate the CH_4emission factor due to APG flaring
QC/QA procedures (to be) applied	-
Any comment	

Data/Parameter	ρ_{CO2}
Data unit	Kg/m^3
Description	Density of CO_2 under standard conditions
Time of determination/monitoring	Once, during determination
Source of data (to be) used	Thermal calculation of boilers (Normative method), NPO CKTI, St. Petersburg, 1998
Value of data applied (for ex-ante calculations/determinations)	1.842
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Density of CO_2 is needed to calculate the CO_2 emission factor due to APG flaring
QC/QA procedures (to be) applied	-
Any comment	-

Data/Parameter	ρ_{CH4}
Data unit	kg/m^3
Description	Density of methane at standard conditions
Time of determination/monitoring	Determined once during the preparation of project design document
Source of data (to be) used	Thermal calculation of boilers (Normative method), NPO CKTI, St. Petersburg, 1998
Value of data applied (for ex-ante calculations/determinations)	0.668
Justification of the choice of data or description of measurement methods and procedures (to be) applied	-
QC/QA procedures (to be) applied	Determined on the basis of the reference data
Any comment	

Data/Parameter	**Nc**
Data unit	unit
Description	Quantity of carbon moles in a mole of a component of APG
Time of determination/monitoring	constant
Source of data (to be) used	Chemical formulae
Value of data applied	Carbon dioxide, CO2 / 1

(for ex-ante calculations/determinations)	methane, CH_4	1
	ethane, C_2H_6	2
	propane, C_3H_8	3
	i-butane, C_4H_{10}	4
	n-butane, C_4H_{10}	4
	i-pentane, C_5H_{12}	5
	c-pentane, C_5H_{12}	5
	n-pentane, C_5H_{12}	5
	hexane, C_6H_{14}	6
	geptane, C_7H_{16}	7
	octane, C_8H_{18}	8
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Quantity of carbon moles in a mole of a component of APG is needed to calculate the CO_2 emission factor due to the combustion of the APG.	
QC/QA procedures (to be) applied	Reference data	
Any comment	-	

Data/Parameter	ε
Data unit	Fractions
Description	Unburned carbon factor for soot combustion of APG in flare units
Time of determination/monitoring	constant
Source of data (to be) used	IPCC 2006
Value of data applied (for ex ante calculations/determinations)	0.02 (2%)
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Recommendations underburning factor 2%
QA/QC procedures (to be) applied	Based on reference data
Any comment	-

Data/Parameter	NCV ng
Data unit	MJ/m3
Description	Lowest value of NCV of natural gas
Time of determination/monitoring	constant
Source of data (to be) used	GOST5542-87
Value of data applied (for ex ante calculations/determinations)	31,8
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Based on reference data
QA/QC procedures (to be) applied	Based on reference data

Any comment	-

The parameters monitored directly

Data/Parameter	FC_{APG_PJ}
Data unit	Ths.m3 (under standard conditions)
Description	The main source of baseline emissions. This APG would be burned at the flare under the baseline.
Time of determination/monitoring	Monthly
Source of data (to be) used	Flow gas meter
Value of data applied (for ex ante calculations/determinations)	**2008**: 3357264 **2009**: 4125706 **2010**: 4502442 **2011**: 4968525 **2012**: 5424568
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Data of 2008-2011 is actual, for 2012 is estimated.
QA/QC procedures (to be) applied	The main measuring instruments are calibrated and verified by "Tyumen Center for Standardization, Metrology and Certification"
Any comment	Sum of monthly volumes of APG to be burned is used to avoid distortion of the result.

Data/Parameter	$W_{CO2,}$ W_{CH4} W_{VOC}
Data unit	%
Description	Component composition of APG. Necessary for calculating emissions when APG is flared at CCP
Time of determination/monitoring	Monthly
Source of data (to be) used	Flow Gas Chromatograph
Value of data applied (for ex ante calculations/determinations)	Carbon dioxide, CO2: 0,57% methane, CH4: 70,90% ethane, C2H6: 5,31% propane, C3H8: 13,00% i-butane, C4H10: 2,41% n-butane, C4H10: 3,43% neo-pentane C5H12: 0,00% i-pentane, C5H12: 1,12% n-pentane, C5H12: 1,00% hexane, C6H14: 0,73% geptane, C7H16: 0,30% octane, C8H18: 0,00% Nonane C9H20: 0,00% Decan C10H22: 0,00% u-decan C11H24: 0,00% hydrogen sulfide, H2S: 0,00%

	nitrogen, N2	1,20%	
Justification of the choice of data or description of measurement methods and procedures (to be) applied	The parameter values for 2008-2011 are based on actual data. The values for 2012 are based on average annual values of 2008-2011.		
QA/QC procedures (to be) applied	The instruments are calibrated and verified by "Tyumen Center for Standardization, Metrology and Certification"		
Any comment	-		

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

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The analysis provided in subsection B.1. clearly demonstrates that the proposed project is not a baseline.

This section demonstrates that the project provides reductions in emissions by sources that are additional to any that would otherwise occur, using the following step-wise approach:

Step 1. Indication and description of the approach applied.

Step 2. Application of the approach chosen.

Step 3. Provision of additionality proofs.

The following is a detailed exposition of this approach.

Step 1. Indication and description of the approach applied.

A JI-specific approach is chosen for justification of additionality. For this purpose provision a) is chosen defined in paragraph 2 of the annex I to the Guidance on criteria for baseline setting and monitoring version 02. 1, i.e: (a) Provision of traceable and transparent information showing that the baseline was identified on the basis of conservative assumptions, that the project scenario is not part of the identified baseline scenario and that the project will lead to reductions of anthropogenic emissions by sources or enhancements of net anthropogenic removals by sinks of GHGs.

Financial barrier is justified further through the investment analysis.

Step 2. Application of the approach chosen.

A JI-specific approach is based on an explanation that the project activity would not have occurred anyway due to existence of *the financial barrier and that this project is not a common practice.*

Step 3. Provision of additionality proofs.

Financial barrier

Financial barrier is justified through the investment analysis and includes the evaluation of the project's financial efficiency. If the results of the analysis show that the project is financially unattractive without being registered as JI-activity than it will be a clear evidence of the project's additionality.

The investment analysis result is quantitative definition of such a economic efficiency indicators as net present value (NPV), internal rate of return (IRR) and discounted payback period (DPB).

For estimation the capital investments of 16,742 million rubles spent for expansion of TNK-BP gas transportation system in Western Siberia. The project starts in 2003 and terminates in 2032. Discount factor equals to 2012 valid in TNK-BP on a date of the Project start.

The results of evaluations are presented below.

Table B2. The outcomes of the estimations of the project's efficiency

DPB	years	67,93
IRR	%	8,43%
NPV	Ths. rubles	-4 429 778

Conclusion:

Project is absolutely unattractive from investor's point of view.

Sensitivity analysis

The sensitivity analysis is made with the use of the economical spreadsheet model. Sensitivity of the project NPV, IRR and DPB to deviation of such factors as the investment cost, APG price and operational costs were assessed. The results of the analysis are presented in the table below.

The results of the analysis are presented in the table below.

Table B 2.1. Results of sensitivity analysis

Item	Capex		Opex		APG price	
	+10%	-10%	+10%	-10%	+10%	-10%
NPV, ths R	-4 964 054	-3 895 502	-6 549 966	-2 309 591	-2 218 292	-2 309 591
IRR, %	8,18%	8,71%	6,70%	10,14%	10,30%	6,31%
DPB,years	72,51	63,36	96,14	47,17	96,14	106,02

Thus, even considerable deviations (from -10% till +10%) of above mentioned factors cannot make enhance the project efficiency indicators. This demonstrates that the project stays economically inefficient even if the economic factors will improve.

Analysis of common practice

This stage supplements the argumentation provided above with the analysis of prevalence of APG utilization activities, particularly, through the construction of gas transportation infrastructure in the oil&gas sector, which represents the *criteria of additionality* for the project activity.

<u>*Description of common situation in the industry*</u>

The level of APG flared has increased over a three-year period of 2006-2009 from 14,1 bln m3 in 2006 till 19,96 m3 in 2009 . Simultaneously, APG recovery dropped from 57,9 bln m3 in 2006 to 31 bln m3 in 2009. Thereby, a share of APG flaring in 2006 was at 24,4% and by 2010 it rose up to 64,3%.

To explain the reasons of flaring of such considerable gas amounts the various aspects related to APG utilization are to be addressed:

From legislatorial point of view there is the package of resolutions, laws and other documents (see the list of these documents in the subsection B1) which is to regulate APG utilization issues. But the lack of real mechanisms allowing to monitor and to enforce implementation of APG utilization makes little progress in this regard.

It should be noted that APG utilization (particularly through feeding into trunk gas pipeline system) requires substantial material expenditures for establishing transport and treatment infrastructure. Therefore, in most cases such projects are not economically efficient for the companies having oil fields located remotely from gas transport system. Among the factors to negatively influence the APG utilization efficiency are:

- Substantially lower gas debits of oil wells as compared with the gas well debits;
- Considerably lower APG pressure; as a consequence the need for compression to supply to a considerable distance
- Presence of considerable amounts of hydrocarbon liquids in APG;
- Need for construction of branching field gas collecting pipelines due to substantial remoteness of the oil fields from gas transport system;
- Low APG sale price to cover expenditures due to implementation of utilization activities.

Besides, the structural aspect impedes efficient APG utilization. The existing trunk gas transmission system (GTS) is unable to provide APG transportation from locations of major APG recovery and delivery to consumers because of too busy schedule. Vast majority of the gas pumped through the trunk gas pipeline system makes the natural gas come from the senoman gas fields of Yamal-Nenets Autonomous Okrug (YaNAO) and, hence, the natural gas has a priority over APG when providing access to the GTS. The access to the GTS of independent APG producers is limited and is allowed if the spare capacity is available. Besides, it is extremely difficult to confirm the availability or the lack of the spare capacity, which is making the problem of access non-transparent and difficult-to-do issue. Another problem arisen hereof is the absence of long-term contracts for gas transportation signed with the private companies that making situation with APG utilization unpredictable.

Conclusion:

All the aspects considered demonstrate that APG utilization (particularly through pumping into GTS) has not become a common practice in Russian Federation. Statistical data show APG flaring increase in 2006-2010. Despite the existence of the relevant legislatorial documents APG utilization is not duly monitored and enforced. On the other hand, the oil companies are extremely reluctant to implement construction of APG collecting and transport infrastructure as due to huge financial expenditures, low APG prices, uncertainty and non-transparency with access to GTS such a kind of projects represent the considerable investment risk.

These considerations are fully applicable for the proposed project, which is economically inefficient due to high capital expenditures for establishing APG transport infrastructure and low APG costs.

Therefore

- This proposed project activity is not a result of state policy for the encouragement of oil companies to utilize APG.

- Project activity is not widely spread in the oil&gas industry of Russia.

Thus, the project activity is not a common practice that means it is *additional*.

B.3. Description of how the definition of the project boundary is applied to the project:
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B.3. Description of how the definition of the project boundary is applied to the project:
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The project boundary embraces GHG emission sources attributed to the project activity. It is only those sources are taken into account emissions from which are above (1%) in the overall quantity of GHG emissions. In the following table the emission sources and GHG types are considered as to including them in the baseline or project boundary.

Table B 3.1. GHG emission sources

Scenario	Source	GHG type	Include/Do not include	Comment
Baseline	APG flaring	CO_2	Included	Main baseline emission source
		N_2O	Not included	Negligibly small
		CH_4	Included	Incomplete burning (2% of APG volume to be flared)
Project	The use of electricity from the grid for the technological needs of CS and BCS	CO_2	Included	Main baseline emission source
		N_2O	Not included	Negligibly small
		CH_4	Not included	Negligibly small
	Methane emissions during APG compression at CS	CO_2	Not included	Negligibly small
		CH_4	Incuded	Main baseline emission source
		N2O	Not included	Negligibly small
	Methane emissions during APG transportation from CS to the GPP	CO_2	Not included	Negligibly small
		N_2O	Not included	Negligibly small
		CH_4	Included	Main baseline emission source

Scenario	Source	GHG type	Included/ not included	Comment
Leakage due to project activities	The use of electricity from the grid for the technological needs of GPP	CO2	Included	Main emission source
	Methane physical leaks (CH4) during APG processing at GPP	CH_4	Not included	Main emission source
	Methane physical leaks (CH4) during APG transportation at the GPP	CH_4	Not included	Negligibly small
Leaks associated with the baseline	Natural gas losses during its production (from wells)	CO_2	Not included	Negligibly small
		N_2O	Not included	Negligibly small
		CH_4	Included	Main emission source
	Burning of fuel gas in gas turbines of CGPU during natural gas processing	CO_2	Included	Main emission source
		N_2O	Not included	Negligibly small
		CH_4	Not included	Negligibly small

Leakage assessment

In accordance with "Guidance on criteria for baseline setting and monitoring", (Version 03) the leakage is determined as "the net change of anthropogenic emissions by sources and/or removals by sinks of GHGs which occurs outside the project boundary, and that can be measured and is directly attributable to the JI project." In case the potential leakage is determined the project participants must undertake an assessment of the potential leakage of the proposed JI project and explain which sources of leakage are to be calculated, and which can be neglected[4]. The project provides for APG consumption at GPP as a result of APG processing coming in under project activity. The main emissions potentially attributable to leakage in the context of the project are emissions arising from:

1. Electricity production in the outer grid for processing of the APG supplied due to the project activity to GPPs and compressor stations (CS). Quantitative evaluation shows that these emissions are significant and should therefore be taken into account for calculation of the reductions.

[4] In accordance with the paragraph 18 of the Guidance on criteria for baseline setting and monitoring (Version 02).

2. Methane physical leaks (CH_4) during processing and preparing of APG at GPPs. Quantitative evaluation shows that these emissions are significant and should therefore be taken into account for calculation of the reductions.

The main emissions potentially attributable to leakage in the context of the baseline are emissions arising from:
- during the production of natural gas at the gas fields;
- using natural gas as a fuel in gas turbines at CGPU.

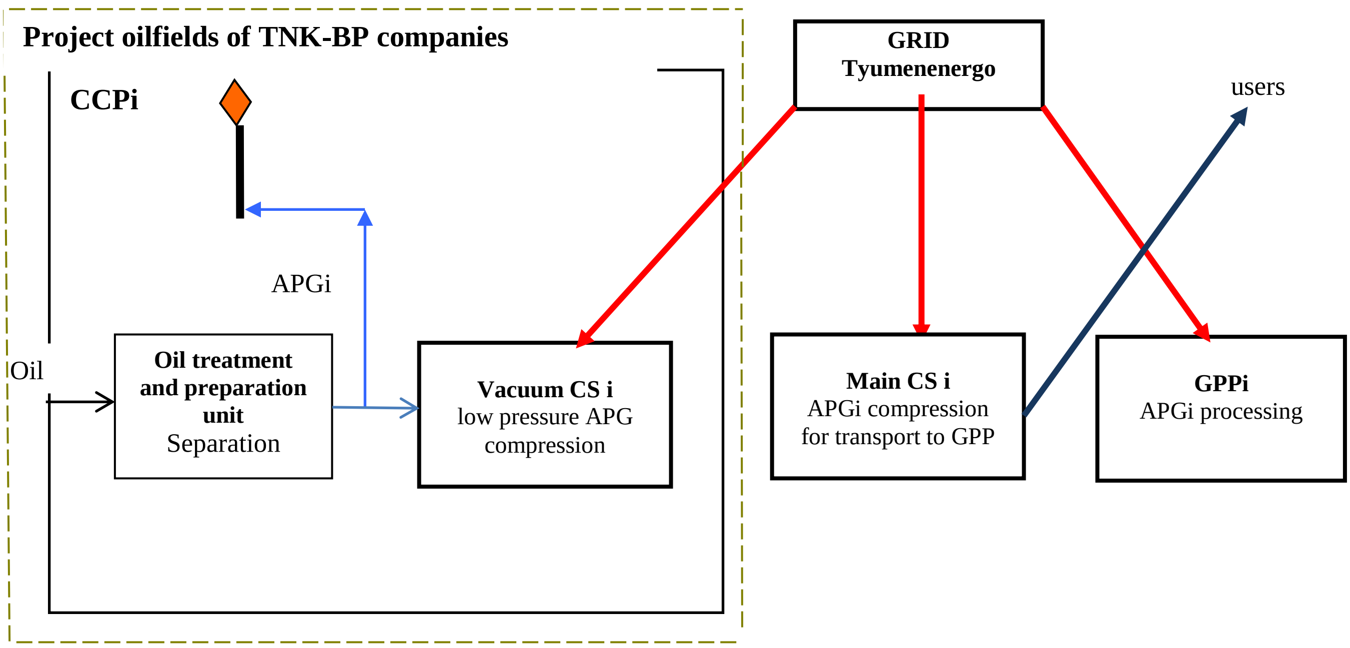
Below, explanation of concept of these leakage is provided:

3. The project provides for the decrease of natural gas consumption by the end-users as commercial dry gas (obtained from APG) will displace an equivalent quantity of the natural gas delivered otherwise to end customers. Therefore reduction of methane emissions due to natural gas production and processing take place. The quantitative assessment provided shows that these emissions are significant (higher than 2000 tCO_2 a year), and hence must be taken into account for CO2 emission reductions calculation. As the equivalent amount of natural gas would be transported under the baseline, the leaks during transportation are equal in both scenarios, which will not lead to additional emissions. Therefore these emissions can be neglected.

Leakage is calculated in accordance with formulas in section D.1.3.2.

Project boundaries schematically embrace oilfield central collection points (CCPs), newly-built or reconstructed gas pipelines and vacuum compression stations (vCS).

Figure B.3.1. Project boundaries



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

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Date of baseline setting: 20.11.2011.

The business plan was established by CARBONTRUST LIMITED– (Cyprus);

Contact persons:

Director Jolanta Narmontaite
Tel. + 357 2267 4949
Fax + 357 2266 6780

CARBONTRUST LIMITED is not a participant of the Project.

SECTION C. Duration of the project / crediting period

C.1. Starting date of the project:

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The project start date is 01/02/2004. The date corresponds to the beginning of construction works for laying the low pressure gas pipeline CTP – NV GPP at Samotlor oilfield, JSC “Samotlorneftegaz”.

C.2. Expected operational lifetime of the project:

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The expected operational project life is estimated from the date of last investments made under the Project in 2012 and is 20 years or 240 months: from 30/12/2012 to 30/12/2032.

C.3. Length of the crediting period:

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Crediting period corresponds to the budget period of Kyoto Protocol and is 5 years or 60 months: from 01.01.2008 through 31.12.2012.

SECTION D. Monitoring plan

D.1. Description of monitoring plan chosen:

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The monitoring plan is described throughout a section D in accordance with paragraph 30 of the Guidance on criteria for baseline setting and monitoring. Project developer applies a JI specific approach for monitoring plan in accordance with paragraph 9 (a) of the Guidance on criteria for baseline setting and monitoring (Version 03), and other applicable JI guidelines. The JI-approach includes consideration of the following steps:

Step. 1. Indication and description of the approach chosen regarding monitoring.
Step. 2. Application of the approach chosen.

Below the approach is presented in more detail.

Step. 1. Indication and description of the approach chosen regarding monitoring

Emission sources

Baseline emissions

Under the baseline scenario the additional APG at the project oilfields (equal to APG utilized under the project less APG that has been historically utilized before the project start) would have been flared causing thus considerable CO_2 и CH_4 emissions. Due to incomplete combustion of APG flaring a part of APG extracted emits to the atmosphere without being oxidized. 2006 IPCC Guidelines for National Greenhouse Gas Inventory prescribes to use 98% efficiency factor when estimating GHG emissions from incomplete flaring combustion[5]. The coefficient of methane emissions in terms of CO2 equivalent is determined by the results of gas analysis, taking into account the volume fractions of the components in the APG.

Project emissions

Under the project activity the additional APG will be efficiently used through gathering and transportation of it for utilization through the expanded gas transportation system established under the project. This will prevent the CO_2 and CH_4 emissions, which would have been under the baseline scenario in the case of flaring. Therefore, project emissions take place in this situation including physical leaks of methane during APG transportation through gas pipelines and its compressing at VCS. Also the compression of APG at VCS requires the electricity consumption, therefore CO2 emissions will take place at the regional grid power stations.

[5] 2006 IPCC Guidelines for National Greenhouse Gas Inventory (Subsection 4.2. “Fugitive emissions from oil and natural gas systems”.

Leakage emissions outside the project boundary occur due to the project

At GPP project APG is fractionated with the yield of the dry stripped gas and NGLs. Dry gas under high pressure is directed into the Gazprom main gas pipeline and NGLs is fed into the condensate pipeline to end users. The electricity consumption at the GPP for processing of the project APG and compressing the output products into the pipelines will cause considerable CO_2 emissions in the power grid.

The project provides for the increase of APG consumption for processing at GPP due to supply of additional volume of APG under the project activity, therefore the CH4 emissions (leaks) during processing of the project APG will be also increased. The quantitative assessment provided shows that these emissions are significant (higher than 2000 tCO2 a year), and hence must be taken into account for CO2 emission reductions calculation.)

Leakage emissions outside the project boundary associated with the baseline

The project provides for the decrease of natural gas consumption by the end-users as commercial dry gas (obtained from APG) will displace an equivalent quantity of the natural gas delivered otherwise to end customers. Therefore reduction of methane emissions (losses) due to natural gas production and processing take place. Estimates of methane losses during the natural gas production recommended for use are publically available in the annual Gasprom environmental reports for period 2008-2010[6].

To determine the emissions during processing of natural gas a conservative value of consumption of fuel gas consumption at the gas complex processing plants (GCPP) is used. The recovered natural gas needs to be compressed at GCPP as the wellhead pressure in the gas fields is not enough[7] to deliver the natural gas in main gas pipeline. To estimate CO2 emissions associated with the fuel at consumption at GCPP it is assumed that modern gas turbines with efficiency of 34% are operated at GCPP.

For taking into account the difference in pressures needed to compress APG and the natural gas up 75 ata to supply in the gas pipeline a correlation coefficient is used as lesser work is needed for compressing the natural gas than for compressing APG after the first separation stage.

<u>*Key emission factors*</u>

CO2 and CH4 emission factors for defining emissions from APG flaring are variable parameters depending on APG chemical composition. For calculation of these factors the approaches proposed in the 2006 IPCC Guidelines for National Greenhouse Gas Inventories (Subchapter 4.2. Fugitive emissions from oil and natural gas systems) are applied.

Leakage outside the project boundary arising from the consumption of electricity for processing needs at GPP is calculated as the product of the specific coefficient of electricity consumption per cubic meter of processed gas and the volume of APG utilized under the project and appropriate value of grid emission factor.

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[6] http://gazprom.ru/interactive-reports/report2010/ru/

[7] http://www.indpg.ru/nefteservis/2008/04/20007.html

The grid emission factors for the Urals grid are provided in the study of European Bank for Reconstruction and Development[8]. The following values are provided:
2008-0.631 tCO2/MWh
2009-0.631 tCO2/MWh
2010-0.638 tCO2/MWh
2011-0.668 tCO2/MWh
2012-0.712 tCO2/MWh

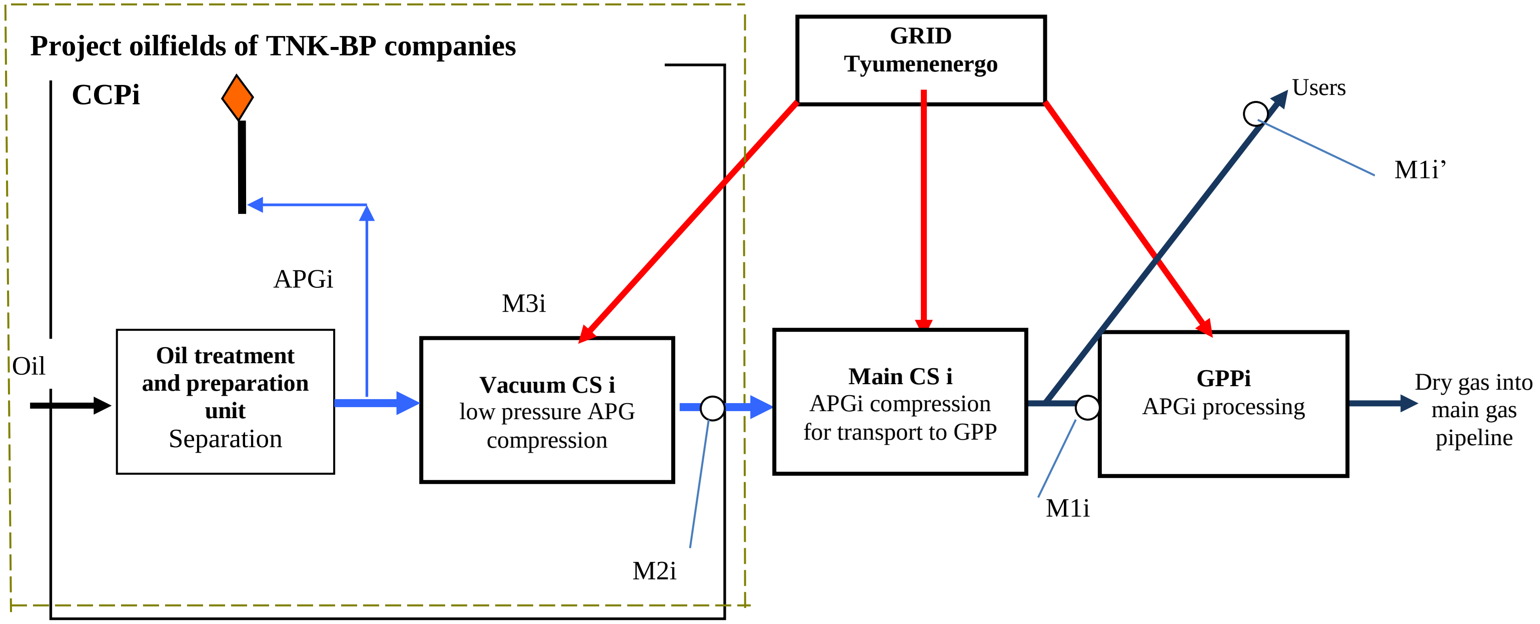
The values of specific coefficient of electricity consumption per cubic meter of APG at GPPs (Beloozerny and Nizhnevartovskiy, Krasnoleninskiy) for the corresponding time period is provided by «Ugragaspererabotka», TNK-BP Nygan and Sibur Holding.

For determining the emissions the following monitoring points will be used:
Monitoring point M1i – additional APG volume supplied from project oilfield i to i GPP (calculated parameter based on difference at all extracted APG and historical part)
Monitoring point M2i – APG chemical composition supplied from i oilfield to GPP
Monitoring point M3i – Electricity composition on i vacuum CS (calculated parameter based on constant specific value of electricity consumption per ths.m3)

Monitoring points for determining these parameters are presented on the following figure.

[8] Baseline Study. Development of the electricity carbon emission factors for Russia. 09 Sept. 2010. Table 5-2. CO2 emission factors for Demand Side for Russian Federation.

Figure D.1.1. Monitoring points



Symbols

	Monitoring points		Crude oil flow
	APG flaring		APG flow on new gas pipeline
Vacuum CS	Compressor station		
CCP	Central collection point		

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
M1i, M1i'	*APG volume supplied from project i-oilfield to j-GPP and users*	*Commercial flow gas meter*	*Ths.m3*	*c*	*monthly*	*100%*	*Electronic and paper*	
M2i	*Chemical composition of iAPG supplied from i oilfield to GPP*	*Gas chromatograph*	*% vol.*	*m*	*monthly*	*100%*	*Electronic*	
M3i	*Electricity consumption at i vacuum CS during APG compression*	*Electricity meter*	*kWh*	*m*	*monthly*	*100%*	*Electronic*	
Data and parameters that are not monitored throughout the crediting period, but are determined only once								
GWP_{CH4}	*Global Warming Potential of methane*	*Decision 2/CP.3 http://unfccc.int/resource/docs/cop3/07a01.pdf#page=31*	*tCO_2/tCH_4*	*e*	*Once*	*100%*	*Electronic*	*21 tCO_2/tCH_4*

		Climate Change 1995, The Science of Climate Change: Summary for Policymakers and Technical Summary of the Working Group I Report, page 22. http://unfccc.int/ghg_data/items/3825.php						
***EF**grid*	*Emission factor for electric power plant of the ESD Ural*	*According to calculations made by Lahmeyer International: "Assessment of the Grid Emission Factor Calculation Model for Russia" http://www.ebrd.com/downloads/sector/eecc/Baseline_Study_Russia.pdf (page 5.3, table*	*tCO2/MWh*	*E*	*Determined once*	*100%*	*Electronic/Paper*	*2008-0,631; 2009-0,631; 2010-0,638; 2011-0,668; 2012-0,712.*

		5.2); http://www.ebrd.com/downloads/sector/eecc/Validation_report_Russia.pdf						
E_{tr}	*IPCC factor for gas transmission operations*	*Emission value is presented in 2006 IPCC Guidelines For National Greenhouse Gas Inventories, volume 2, chapter 4, table 4.2.5.*	*GgCH4/ mln. m3*	*e*	*Determined once*	*100%*	*Electronic*	*0,0011 GgCH4/ mln. m3*
E_p	*IPCC factor for processing operations*	*Emission value is presented in 2006 IPCC Guidelines For National Greenhouse Gas Inventories, volume 2, chapter 4, table 4.2.5.*	*GgCH4/ mln. m3*	*E*	*Determined once*	*100%*	*Electronic*	*0,0011 GgCH4/ mln. m3*

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 GHG emissions due to electricity consumption at i vacuum CS and due to methane physical losses during APG compression and transportation at i gas pipeline

$$PE=(E_{tr}*FC_{APG\_PJ}*1000*W_{CH4,av}*GWP_{CH4})+(E_{p}*FC_{APG\_PJ}*1000*W_{CH4,av}*GWP_{CH4})+(EC_{c}*EFgrid) \qquad (1)$$

PE – project emissions during electricity consumption at i vacuum CS and due to methane physical losses during APG compression and transportation, tCO2;
FC_{APG_PJ} – additional i APG volume transported through the new gas pipeline system, i.e. supplied from oilfields to GPP for utilization, ths. m^3, calculated parameter;
E_{tr} – IPCC factor for gas transmission operations (emission value is presented in 2006 IPCC Guidelines For National Greenhouse Gas Inventories, volume 2, chapter 4, table 4.2.5.), GgCH4/ mln. m3;
E_{p} – IPCC emission factor for fugitive emissions from gas processing operations (emission value is presented in 2006 IPCC Guidelines For National Greenhouse Gas Inventories, volume 2, chapter 4, table 4.2.5.), GgCH4/ mln. m3;
$W_{CH4,av}$– average annual value of methane volume fraction in i APG at i project oilfield CCP (based on the protocols of gas analysis in i oilfield);
GWP_{CH4} – Global Warming Potential for methane 21 tCO_2/tCH_4;
EC_{c}– electricity consumption rate during APG compression at vacuum CS, kWh; calculated parameter;
EFgrid– grid emission factor for Urals grid system, tCO2/ MWh.

$$FC_{APG\_PJ} = (FC_{APG\_GPP} - FC_{APG\_users}) - FC_{hisAPG\ max} \qquad (2)$$

FC_{APG_GPP} – volume of APG transported to the GPPs from the project oilfields, ths. m^3
FC_{APG_users} – volume of APG transported to the other users from project oilfields, ths. m^3
$FC_{his\_APG\_max}$ – maximal historical volume of APG supplied for utilization in 2000-2003 prior the project start.

$$EC_{c} = iSEC_{APG} * FC_{APG\_PJ} \qquad (3)$$

$iSEC_{APG}$ – specific electricity consumption at i vacuum CS during the compression of additional volume of APG, kWh/ths.m3. This parameter is available annually on request from the operator TNK-BP

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*	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?	Comment

cross-referencing to D.2.)							(electronic/ paper)	
M1i, M1i'	*APG volume supplied from project i-oilfield to j-GPP and users*	*Commercial flow gas meter*	*Ths.m3*	*c*	*monthly*	*100%*	*Electronic and paper*	
M2i	*Chemical composition of iAPG supplied from i oilfield to j-GPP*	*Gas chromatograph*	*% vol.*	*m*	*monthly*	*100%*	*Electronic*	
Data and parameters that are not monitored throughout the crediting period, but are determined only once								
ρ_{CH4}	*Density of methane CH_4 under standard conditions*	*Thermal calculation of boilers (Normative method), NPO CKTI, St. Petersburg, 1998*	kg/m^3	*e*	*Once*	*100%*	*Electronic*	$0.668\ kg/m^3$

GWP_{CH4}	*Global Warming Potential of methane*	*Decision 2/CP.3 http://unfccc.int/resource/docs/cop3/07a01.pdf#page=31 Climate Change 1995, The Science of Climate Change: Summary for Policymakers and Technical Summary of the Working Group I Report, page 22. http://unfccc.int/ghg_data/items/3825.php*	tCO_2/tCH_4	*e*	*Once*	*100%*	*Electronic*	21 tCO_2/tCH_4
$W_{CH4,} \sum W_{NMVOC}$	*Number of moles of carbon in methane and NMVOC respectively*	*IPCC Guidelines for National Greenhouse Gas Inventories, 2006 – Volume 2: Energy, Chapter 4: Fugitive Emissions, p. 4.45*	*Moles*	*e*	*Once*	*100%*	*Electronic*	$n_{C,CH4} = 1$; $n_{C,C2H6} = 2$; $n_{C,C3H8} = 3$; $n_{C,C4H10} = 4$; $n_{C,C5H12} = 5$; $n_{C,C6H14} = 6$; $n_{C,CO2} = 1$; $n_{C,N2} = 0$; $n_{C,O2} = 0$; $n_{C,He} = 0$.

ρ_{CO2}	*Density of CO_2 under standard conditions*	*Thermal calculation of boilers (Normative method), NPO CKTI, St. Petersburg, 1998*	*kg/m^3*	*e*	*Once*	*100%*	*Electronic*	*equals to 1.842 kg/m^3*

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

>>

GHG baseline emissions due APG flaring at oilfield i CCP

$$\mathbf{BE = FC_{APG\_PJ}*(EF_{CO2,APGi} + EF_{CH4,Fi})} \qquad (4)$$

BE – baseline emissions, tCO_2.
FC_{APG_PJ} – additional i APG volume transported through the new gas pipeline system, i.e. supplied from oilfields to GPP for utilization, ths. m^3, calculated parameter
$EF_{CO2,APGi,}$ – annual average CO_2 emission factor during APG flaring at i CPP, tCO2/ths. m^3;
$EF_{CH4,\ Fi}$ – annual average CH_4 emission factor during APG flaring at i CPP, tCO2/ths. m^3;

$$\mathbf{EF_{CO2,APGi} = (W_{CO2} + (NC_{CH4}*W_{CH4} + \sum jNC_{VOCj}*W_{VOC\ i}))*\rho_{CO2}*OXID} \qquad (5)$$

$W_{CO2,}Wy_{CH4}$ W_{VOC} – average annual volume fractions of carbon, methane and volatile organic compounds (VOC) in APG at i CCP (information source – gas analysis protocol);
$NC_{CH4,}$ $\sum jNC_{VOCj}$ – number of moles of carbon in a methane mole and VOC respectively ($\sum jNc_{VOCj}$ where j - specific VOC component);
ρCO_2 – density CO_2 at 20°C equal 1.842 kg/m^3;
OXID - APG flaring efficiency is equal 0.98

Due to incomplete combustion of APG flaring a part of APG extracted emits to the atmosphere without being oxidized. 2006 IPCC Guidelines for National Greenhouse Gas Inventory prescribes to use 98% efficiency factor when estimating GHG emissions from incomplete flaring combustion[9].

[9] 2006 IPCC Guidelines for National Greenhouse Gas Inventory (Subsection 4.2. “Fugitive emissions from oil and natural gas systems”.

$$EF_{CH4,Fi} = W_{CH4,av}*\rho_{CH4}*(1-OXID)*GWP_{CH4} \quad (6)$$

W_{CH4} – average annual volume methane fraction in APG at i CCP (source information – gas analysis protocol);
ρ_{CH4} – methane CH4 density under standard conditions is equal 0.668 kg/m^3.

OXID – APG flaring efficiency is equal to 0,98.

GWP_{CH4} – Global Warming Potential for methane equal to 21 tCO_2/tCH_4,

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

This option is not used.

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

>>
Not applicable.

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
M1i, M1i'	*APG volume supplied from project i-oilfield to j-GPP and users*	*Commercial flow gas meter*	*Ths.m3*	*c*	*monthly*	*100%*	*Electronic and paper*	
M2i	*Chemical composition of iAPG supplied from i oilfield to GPP*	*Gas chromatograph*	*% vol.*	*m*	*monthly*	*100%*	*Electronic*	
Data and parameters that are not monitored throughout the crediting period, but are determined only once								
$v_{GPP\ APG}$	*Yield of dry gas from APG processing at GPP*	*Data from technical reports of GPPs (Nizhnevartovskoye /Beloozernoye)*	*%*	*e*	*Determined once*	*100%*	*in a hard copy*	
EF_{grid}	*Grid emission factor for Urals grid system*	*Baseline Study. Development of the electricity carbon emission factors for Russia. 09 Sept. 2010. Table 5-2. CO2 emission factors for Demand Side for Russian Federation.*	*tCO2/MWh*	*e*	*Determined once*	*100%*	*Electronic/Paper*	*2008-0,631; 2009-0,631; 2010-0,638; 2011-0,668; 2012-0,712.*

$\boldsymbol{SEC_{gpp}}$	*specific electricity consumption factor during APG processing at GPP*	*This parameter is presented annually by request to Yugragazprocessing and TNK-BP, Sibur*	*kWh/ths.m^3*	*e*	*Determined once*	*100%*	*Paper*	
$\boldsymbol{E_{proc}}$	*loss factor during processing of APG at GPP*	*This parameter is presented annually by request to Yugragazprocessing, TNK-BP, Sibur*	*%*	*e*	*Determined once*	*100%*	*Paper*	
ρ_{CH4}	*Density of methane CH_4 under standard conditions*	*Thermal calculation of boilers (Normative method), NPO CKTI, St. Petersburg, 1998*	*kg/m^3*	*e*	*Determined once*	*100%*	*Electronic*	*0.668 kg/m^3*
ρ_{CO2}	*Density of CO_2 under standard conditions*	*Thermal calculation of boilers (Normative method), NPO CKTI, St. Petersburg, 1998*	*kg/m^3*	*e*	*Determined once*	*100%*	*Electronic*	*equals to 1.842 kg/m^3*
$\boldsymbol{EF_{NG\ prod}}$	*loss factor for natural gas during its production presented in the annual environmental report of JSC*	*Annual report of JSC Gazprom*	*%*	*e*	*Determined once*	*100%*	*Electronic*	$EF_{NG\ prod\ 2008}$ – 0.00070 $EF_{NG\ prod\ 2009}$ – 0.00052 $EF_{NG\ prod\ 2010}$ – 0.00029 $EF_{NG\ prod\ 2011}$ – 0.00029

	Gazprom							*$EF_{NG\ prod\ 2012}$ – 0.00029*
SEC_p	*Specific electricity consumption for gas compressing & processing complex gas processing plants of Sibur with standart efficiently*	*This value is taken from determinated PDD of the JI project « The utilization of associated petroleum gas of the Yarayner oilfield of JSC "Gazpromneft-Noyabrskneftegaz»*	*kW/ths.m3*	*e*	*Determined once*	*100%*	*Electronic/paper*	*475 kW/ths.m3*
NCV_{NG}	*net calorific value of the natural gas*	*GOST 5542-87*	*kcal /m^3*	*e*	*Determined once*	*100%*	*Electronic*	*7600 kcal /m^3*

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

>>

Leakage effect is defined as net change of anthropogenic emissions outside the project boundary:

$$\mathbf{LE = LE_{BL} - L} \qquad (7)$$

LE_{BL} – is the leakage emissions associated with the baseline, tCO2e;
L – is the emissions due to the project activity, tCO2e.

Total leakage due to project activity is calculated by the following formula:

$$\mathbf{L = L_{gpp\ ec} + L_p} \qquad (8)$$

Leakage associated with the electricity consumption at GPP during processing operations over additional APG project volume:

$$L_{gpp\ ec} = SEC_{gpp} * FC_{APG\_PJ} * EFgrid \quad (9)$$

FC_{APG_PJ} – additional i APG volume transported through the new gas pipeline system, i.e. supplied from oilfields to GPP for utilization, ths. m^3;
SEC_{gpp} –specific electricity consumption factor during APG processing at iGPP, kWh/ths.m^3.
EF_{grid} – grid emission factor, tCO2/ MWh.

Leakage related to methane physical losses during processing of APG project volume at GPP:

$$Lproc = E_{proc} * FC_{APG\_PJ} * 1000 * W_{CH4,av} * \rho_{CH4} * GWP_{CH4} \quad (10)$$

FC_{APG_PJ} – additional i APG volume transported through the new gas pipeline system, i.e. supplied from oilfields to GPP for utilization, ths. m^3;
E_{proc} – maximal loss factor during processing of APG at GPP, %;
$W_{CH4,av}$ – average volume methane fraction in i APG at CS, gas analysis protocol;
ρCH4– methane CH4 density under standard conditions is assumed to be 0,668 кг/$м^3$;
GWPCH4 – Global Warming Potential for methane is assumed to be 21 tCO_2/tCH_4.

Total leakage associated with the baseline:

$$LE_{BL} = LE_{NG,rec} + LE_{NG\ GT} \quad (11)$$

$LE_{NG,rec}$ – emissions due natural gas recovery at the gas fields;

$LE_{NG\ GT}$ – emissions due to combustion of the natural gas in gas turbines at complex gas processing plants (CGPU) at gas oil fields of during preparation of an equivalent volume of natural gas for transportation, tCO2.

Emissions due to recovery of the natural gas

$$LE_{NG,rec} = FC_{APG\_PJ} * v_{GPP\ APG} * EF_{NG\ prod} * GWP_{CH4} \quad (12)$$

FC_{APG_PJ} – additional i APG volume transported through the new gas pipeline system, i.e. supplied from oilfields to GPP for utilization, ths. m^3;

$v_{GPP\ APG}$ – a dry gas-from-APG- yield rate at GPP, %

$EF_{NG\ prod}$ – loss factor for natural gas during its production presented in the annual environmental report of JSC Gazprom, %

Leakage during natural gas combustion in gas turbines at CGPU

$$\mathbf{LE_{NG\ GT} = (SFC_{GT} * FC_{APG\_PJ} * V_{GPP\ APG} * EF_{CO2,GT})/l_{com}} \quad (13)$$

SFC_{GT} specific consumption of natural gas in modern gas turbines for natural gas compression and processing at CGPP, m3/ths m3:

$$\mathbf{SFC_{GT} = ((SEC_p * C)/\ έ_{modern\ GT})/NCV_{NG}} \quad (14)$$

C - kWh- to- calorie conversion factor, 1kWh=0,86*10^6 cal;

$έ_{modern\ GT}$ efficiency of a modern gas turbine assumed to be 34% (this value is close to the equivalent thermal efficiency of power plants of the Urals grid with an annual emission factor equal to 0,606 tCO2/MWh);

NCV_{NG} - net calorific value of the natural gas (according to the GOST 5542-87), kcal /m^3;

$EF_{CO2,GT}$ – CO_2emission factor due to the natural gas combustion in gas turbines at CGPP, tCO_2/ths. m^3

SEC_p – specific electricity consumption for gas compressing & processing at complex gas processing plants, kWh/ths.m^3

$$\mathbf{EF_{CO2,GT} = NCV_{NG\ lowest} * EF_{NG}} \quad (15)$$[10]

$NCV_{NG\ lowest}$ – lowest value of NCV of natural gas by GOST, equivalent =31,8 MJ/m3[11];

EF_{NG} – CO_2 emission factor due to the natural gas combustion by IPCC 2006, =56,1 tCO_2/TJ

[10] **$EF_{CO2,GT}$**=1,79 tCO2/ths. m3. This approach and factor was applied in PDD of the JI project "Gathering of APG at the Khokhryakovskoye oilfield" that has been positive determinated by Bureau Veritas Certification.

[11] GOST 5542-87.

lcom - correlation coefficient at first pressure created when operating a gas turbine (medium pressure of natural gas at the well head is 30 ata – APG medium pressure on the second and third separation stages is 2 ata)

$$l_{com} = (((P2_{apg}/P1_{apg})^{((1{,}31-1)/1{,}31))}-1)/(P_{2\,ng}/P1_{ng})^{((1{,}31-1)/1{,}31))}-1) \quad (16)$$

lcom is a correlation coefficient, which represents a ratio of a work to compress (i.e. increasing pressure from P1 to P2) APG at i-CS for transportation to main gas pipeline to a work to compress natural gas at a complex gas processing plant (CGPP) of Gazprom to transport natural gas to the main gas pipeline.

1,31 – adiabata of methane (CH4) (determined once)

$P2_{apg}$ – is the pressure at the outlet of CS, equal to 30 ata;
$P1_{apg}$ – is the pressure at the inlet of CS, equals to 2 ata;

$P_{2\,ng}$ - pressure at the inlet of a gas pipeline, 75 ata (standard value of pressure during gas transmission in JSC Gazprom)

$P_{1\,ng}$ – medium pressure of natural gas in gas wells fields of Bolshoy Urengoy (50 ata)[12]

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):

>>

$$ER = BE – PE - LE \quad (17)$$

ER – CO_2 emission reduction due Project realization, t CO_2
BE – CO_2 baseline emissions, tCO_2
PE – CO_2 project emissions, tCO_2
LE – leakage, tCO_2

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:

>>

Information on Project influence on environment will be presented in accordance with legislation of Russian Federation [13].

[12] http://www.indpg.ru/nefteservis/2008/04/20007.html,

[13] *Federal law " On Air Protection "* (4 May 1999. N 96-*FL).*

According the to environment protection legislation a company must control emissions of pollutants, wastewater discharges, organise and provide management of waste production and consumption, provide established accountability to authorized state agencies (The Federal Service for Ecological, Technological and Nuclear Supervision). In the project companies a work on environmental protection is organized by departments of environment protection. Department on schedule prepares and presents to authorized state agencies official statistical reports and forms, including:

– 2-TP (air) - data on air protection, including information about the number of trapped and neutralized pollutants, detailed information about emissions of particular pollutants, number of emission sources, measures to reduce emissions and emissions from particular groups of pollution sources;
– 2-TP (water resources) - data on water usage, including information about water consumption from natural sources, wastewater discharges and content of pollutants in water, water capacity and etc. sewage treatment plants;
– 2-TP (waste products) – data on generation, use, neutralization, transportation and disposal of waste production and consumption, including annual balance of wastes separately by its types and hazard category.

At the design stage sources and types of impact were considered, assessment of the current state of pollution was made, preliminary forecast was performed and measures on protection of the environment were scheduled. Herewith assessment of the impact on the environment and assessment of the damage, taking into account environmental protection measures provided by the project is given to the following components of the environment:

- ground;
- atmospheric air;
- geotechnical conditions;
- geomorphological conditions;
- landscape complexes;
- soils;
- animal world

According to the results of environmental studies and preliminary assessment of the impact on the environment of the planned economic activity, placement of the planned objects for APG transportation with supply pipelines» doesn't entail irreversible processes. A preliminary environmental impact is estimated as a local, short-term and acceptable.

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.
M1, M1', M2,M3 table D.1.1.1 and table D.1.1.3, D1.3.1	low	Calibration of measuring devices is carried out by Corporation «IMS» Ltd. Gospoverka Gos. Standard, the city of Tyumen, as well as FGU *«Tyumen center* for standardization, metrology and certification». Measured by a set of instruments which are calibrated every 1-3 years

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

>>

The operational and management structure for the monitoring of emission reductions for the project will be adapted to the management system existing in TNK BP Company. The Monitoring plan is based on the national standard GOST R “State system for ensuring the uniformity of measurements. System for measuring of quantity and parameters of free oil gas. General metrological and technical requirements” and corporate automated program “Gas quality measurement system” and “System of collection and processing of information”

Information required for calculation of GHG emission reductions is gathered as it is usually done on production site in project oil and gas enterprise, therefore monitoring doesn’t require any other additional information compared to already gathered.

All necessary data are under the supervision, which is a common, everyday practice: data from sensors of monitoring checkpoints, including data on APG composition, are transferred to automated meters and at the same time automatically fixed in electronic data base of workstation and are reflected at the central dispatching office.

Data on APG composition is received directly on CS through the measurement with the flow gas analyzer, which provides the required accuracy class. Based on two- hour statistic data the daily and monthly APG production data are formed.

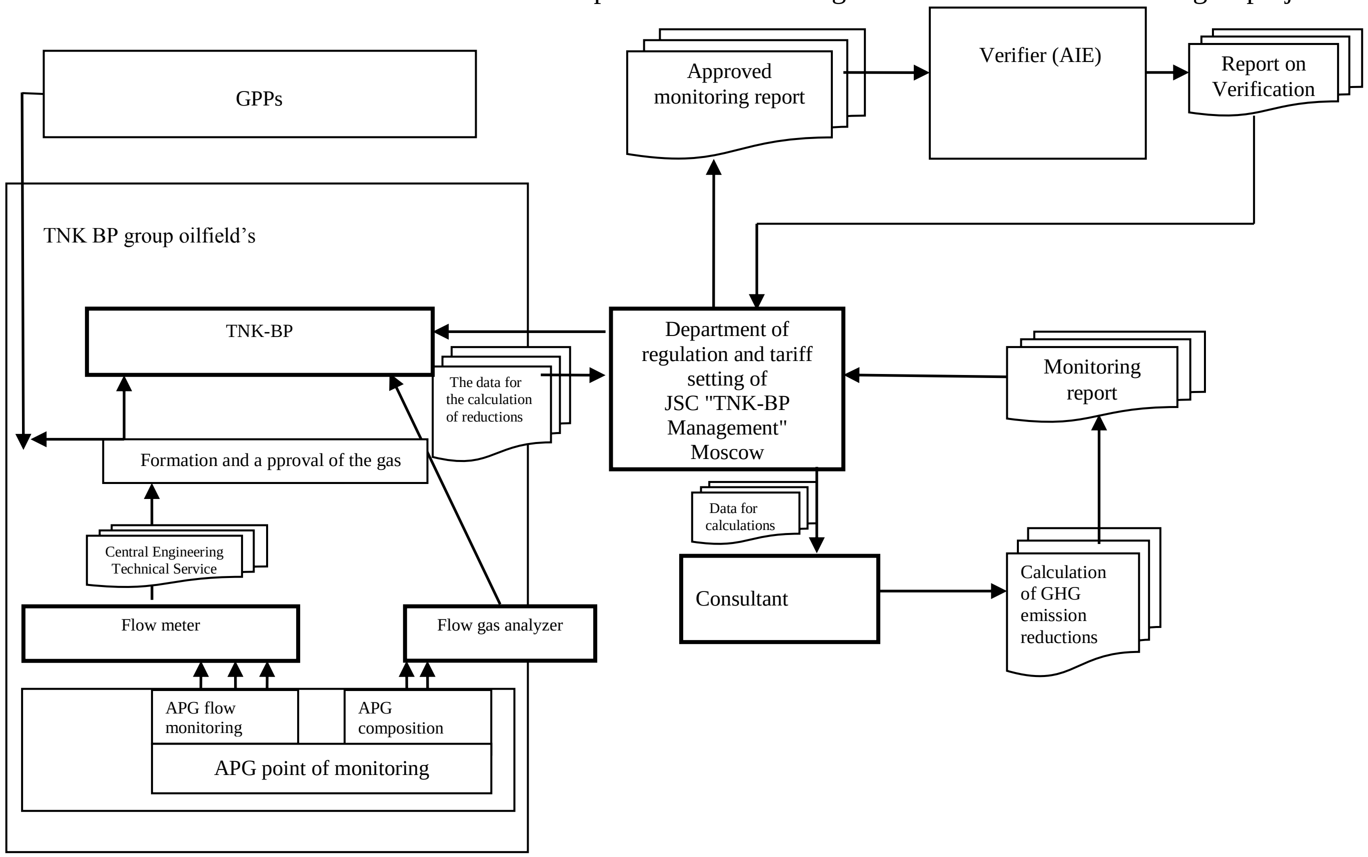
Calculation of GHG emission reductions is conducted based on monthly production reports on gas supply according to the TNP-BP activity on project fields, as well as data on manufacturing activity of other company at Beloozerniy and Nizhnevartovskiy gas processing plants. Completed and signed monthly production reports reflecting values of specified data in monitoring, except APG composition, are provided by request to Department of regulation and tariff setting of JSC "TNK-BP Management" Moscow. This department conducts internal audits of presented data with a view to an incorrect compiling and presence of errors.

Annually this department provides annual summary based on monthly gas production reports along with monthly data on the gas composition from projects CS located at project fields, as well as other annual data from the consulting company for the calculation of annual GHG emission reductions and the monitoring report.

Annual monitoring report on GHG emissions is sent via e-mail to Department of regulation and tariff setting of JSC "TNK-BP Management" for approval. Approved annual report is supplied to AIE for the annual verification of achieved emission reductions. Graphically, the structure of the monitored reductions in the project is as follows.

Storage of monitoring data in JSC "TNK-BP Management" carried out in electronic form on the network resources. All monitoring data will be stored for 2 years after the end of the crediting period.

Scheme D 3. Operational and management structure for monitoring of project activities



All relevant data for monitoring will be stored during two years after the last transfer of ERUs under this Project.

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

The monitoring plan was established by CARBONTRUST LIMITED– (Cyprus);

Contact persons:

Director Jolanta Narmontaite
Tel. + 357 2267 4949
Fax + 357 2266 6780

CARBONTRUST LIMITED is not a participant of the Project.

SECTION E. Estimation of greenhouse gas emission reductions

For estimating GHG emissions resulting from implementation of the project the formulas presented in section D are used.

E.1. Estimated project emissions:

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Table E 1.1. Project emissions due to methane (CH_4) physical leaks during APG compression at vacuum CS in 2008-2012

Item	Designation	Units	**2008**	**2009**	**2010**	**2011**	**2012**
Emission factor for fugitive emissions from gas operations	Ep	GgCH4 /mln m^3	0,0011	0,0011	0,0011	0,0011	0,0011
Additional i APG volume transported for utilization	FC_{APG_PJ}	mln m^3	3 357	4 126	4 502	4 969	5 425
Global Warming Potential	GWP_{CH4}	tCO_2/tCH_4	21	21	21	21	21
Project emissions during APG compression	PEpr	tCO2	77553	95304	104006	114773	125308

Table E1.2. Project emissions due to methane (CH_4) physical leaks during APG transportation from vacuum CS to gas collection network in 2008-2012

Item	Designation	Units	**2008**	**2009**	**2010**	**2011**	**2012**
Emission factor for fugitive emissions from gas transportation (2006 IPCC)	Etr	GgCH4/ mln m^3	0,0011	0,0011	0,0011	0,0011	0,0011
Additional i APG volume transported for utilization	FC_{APG_PJ}	mln m^3	3 357	4 126	4 502	4 969	5 425
Global Warming Potential for methane	GWP_{CH4}	tCO_2/tCH_4	21	21	21	21	21
Project emissions during APG transportation	PEt	tCO_2	77553	95304	104006	114773	125308

Table D 1.3. CO2 emissions due to consumption of electricity from the grid at vacuum CS during compression of APG in 2008-2012

Item	Designation	Units	2008	2009	2010	2011	2012
Electricity consumption at CS	ECcs	Ths.kWh	458602	563571	615034	678701	740996
Grid emission factor	EFgrid	tCO2/MWh	0,631	0,631	0,638	0,668	0,712
Project emissions due to consumption of electricity at vCS	PEcs	tCO2	289378	355614	392391	453372	527589

Table E 1.5. Total project emissions in 2008-2012

Total project emissions	PE	tCO2e	444484	546221	600404	682918	778204

E.2. Estimated leakage:

>>

Leakage due to the project activity

Table E 2.1. CO_2 emissions due to electricity consupmtion from the grid at GPP during additional APG volume processing in 2008-2012

Item	Designation	Units	2008	2009	2010	2011	2012
Specific electricity consumption for processing APG at the GPP	SECgpp	kWh/ths m3	257,9	256,05	255,9	254,55	256,1
Additional i APG volume transported for utilization	FC_{APG_PJ}	ths.m3	3357264	4125706	4502442	4968525	5424568
Grid emission factor	EF grid	tCO2/MWh	0,631	0,631	0,638	0,668	0,712
GHG emissions due to electricity consupmtion from the grid during project APG processing	Lgpp	tCO2	546344	666580	735088	844845	989133

Table E 2.2. CO_2 emissions due to physical gas losses during processing operations at GPP over additional APG in 2008-2012

Item	Designation	Units	**2008**	**2009**	**2010**	**2011**	**2012**
Gas loss share during processing at GPP	Eproc	%	0,92%	0,98%	0,74%	0,69%	0,83%
Additional i APG volume transported for utilization	FC_{APG_PJ}	ths. m^3	3357264	4125706	4502442	4968525	5424568
Global Warming Potential	GWP_{CH4}	tCO_2/tCH_4	21	21	21	21	21
CO_2 emissions due to	LEproc	tCO2e	305522	402124	329133	340967	447795

physical gas losses during processing operations at GPP							

Table E 2.3. Total leakage due to the project activity

Total leakage due to the project activity	LE	tCO2e	851866	1068704	1064220	1185812	1436928

Leakage associated with the baseline

Table E 2.4. CO2eq emissions due physical methane leaks during natural gas recovery in 2008-2012.

Item	Designation	Units	2008	2009	2010	2011	2012
Additional i APG volume transported for utilization	$FC_{APG,PJ}$	ths. m^3	3357264	4125706	4502442	4968525	5424568
Yield of dry gas during APG project volume processing, which is pumped into the main gas pipeline	Vgpp	%	86	87	87	88	87
Gas losses share from the wells at Gazprom fields	%	-	0,00070	0,00052	0,00029	0,00029	0,00029
Global Warming Potential for methane	GWP_{CH4}	tCO_2/tCH_4	21	21	21	21	21
CO2eq emissions due physical methane leaks during	$LE_{NG,rec}$	tCO2eq	42539	38849	24388	28388	32084

natural gas recovery							

Table E 2.5. CO2eq emissions due natural gas (fuel gas) burning at CGPP in 2008-2012.

Rate	Designation	2008	2009	2010	2011	2012
Specific gas consumption at Gazprom's CGPP during natural gas processing and compression (modern gas turbines, 34% efficiency)	m3/ths. m3	158	158	158	158	158
CO2 emission factor for combustion natural gas in gas turbine at Gazprom's CGPP	tCO2/ths. m3	1,791	1,791	1,791	1,791	1,791
Additional i APG volume transported for utilization	ths. m^3	3357264	4125706	4502442	4968525	5424568
Yield of dry gas at GPP during APG project volume processing, which is pumped into the main gas pipeline	%	86	87	87	88	87
Pressure correlation coefficient	-	9,1	9,1	9,1	9,1	9,1
CO2eq emissions due natural gas (fuel gas) burning at CGTU	tCO2eq	90314	111584	122614	136235	147277

Table E 2.6. Total leakage associated with the baseline in 2008-2012.

Designation	Units	2008	2009	2010	2011	2012
Total leakage associated with baseline	tCO_2e	132853	150433	147003	164624	179360

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

>>

Table D 3.1. The sum of project emissions and leakage difference in 2008-2012.

Item	Units	2008	2009	2010	2011	2012
Sum	tCO_2e	1 163 497	1 464 492	1 517 622	1 704 107	2 035 771

E.4. Estimated baseline emissions:

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Table E 4.1. CO2eq emissions due to APG flaring under the baseline at the project fields in 2008-2012.

Item	Designation	Units	2008	2009	2010	2011	2012

Flaring of additional APG under the baseline	FC_{APG_PJ}	ths. m^3	3357264	4125706	4502442	4968525	5424568
CO_2 emission factor at flaring	$EF_{CO2,APGi}$	tCO_2/ths. m^3	2,92	2,92	2,92	2,92	2,92
CO_2 emissions due to APG flaring under the baseline	BE_{CO2}	tCO_2	9789026	12029630	13128106	14487100	15816817
Flaring of additional APG under the baseline	FC_{APG_PJ}	ths. m^3	3357264	4125706	4502442	4968525	5424568
CH_4 emission factor (in CO_2 equivalent)	$EF_{CH4,Flare}$	tCO_2e/ths.m^3	0,199	0,199	0,199	0,199	0,199
CH_4 emissions (in CO_2 equivalent) due to APG flaring under the baseline	BE_{CH4}	tCO_2e	667808	820662	895600	988310	1079024
Total baseline emissions	BE	tCO2	10456833	12850292	14023706	15475410	16895841

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

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Emission reductions resulting from implementation of the project are calculated by the formula 18 in section D

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

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Years	Estimated project emissions (tonnes of CO2 equivalent)	Estimated leakage (tonnes of CO2 equivalent)	Estimated baseline emissions (tonnes of CO2 equivalent)	Estimated emission reductions (tonnes of CO2 equivalent)
2008	444 484	719 013	10 456 833	9 293 337
2009	546 221	918 272	12 850 292	11 385 799
2010	600 404	917 218	14 023 706	12 506 084
2011	682 918	1 021 189	15 475 410	13 771 304
2012	778 204	1 257 567	16 895 841	14 860 069
Total (tonnes of CO2 equivalent)	3 052 231	4 833 258	69 702 082	61 816 593

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:

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In accordance with the Resolution of the State Committee on Ecology and Natural Resources of Russian Federation from 15.04.2000 № 372 «On approval of regulations to implement the planned economic and other activities and their impact on the environment» developers should include environmental impact assessment in project documentation.

Technical documentations elaborated for the each project activity contain sections devoted to environmental protection issues. These sections consider the following impacts the project activities may cause:

- Impact on soil resources.
- Impact on air.
- Impact on vegetation.
- Impact on animal world.

The key finding of the environmental protection sections is that, in general, the project impact is insignificant both in construction and operation period. The performed ecological expertise shows that the project activities do not negatively affect atmosphere, soil and animal world.

The technical documentation underwent examination with the regional offices of the state supervising bodies, such as FGU "GlavGosExpertiza Possii" or Rosprirodnadzor office in KhMAO.

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:

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Project represents itself the environment-friendly activity, as it is directed at reducing APG flaring at project oilfields. Thereby this leads to significant methane emissions reductions in the amount of 6192466 tCO_2e in the period of 2008 - 2012.

SECTION G. Stakeholders' comments

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

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No consultations with stakeholders on the project are required for the following reasons:

1. TNK-BP companies rent the plots, where Project oilfields are located, from the local government. Before the beginning of field development company undertook the necessary consultations with the local population to discuss environmental issues that may arise in connection with the company's activity.
2. The site of the area that hosts the project is rented out of the water protection zones, pastures and migration routes of reindeers. This site does not apply to categories of land with priority environmental management.
3. The project improves ecological environment as it's realisation decreases pollution by toxic substances in terms of APG flaring.

Annex 1

CONTACT INFORMATION ON PROJECT PARTICIPANTS

Organisation:	Joint-stock company TNK-BP Management
Street/P.O.Box:	Begovaya
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Fax:	-
E-mail:	*company@tnk-bp.com*
URL:	www.tnk-bp.com
Represented by:	
Title:	Project Manager
Salutation:	Mr.
Last name:	Mesropov
Middle name:	-
First name:	Andrias
Department:	-
Phone (direct):	-
Fax (direct):	-
Mobile:	--
Personal e-mail:	avmesropov@tnk-bp.com

Annex 2

BASELINE INFORMATION

Fixed values determined once at the stage of verification and are available throughout the entire period 2008-2012

The key information and data used to establish the baseline:

Data/Parameter	**$FC_{hisAPG\ max}$**
Data unit	ths m^3 (under standard conditions)
Description	Maximum volume of historical utilized APG in old pipeline infrastructure at TNK-BP oilfields
Time of determination/monitoring	constant
Source of data (to be) used	APG annual technical reports
Value of data applied (for ex-ante calculations/determinations)	<table><tr><td>Company</td><td>Units</td><td>2003</td></tr><tr><td>SNG</td><td>mln.m3</td><td>2 111</td></tr><tr><td>TNK-Nyagan</td><td>mln m3</td><td>495</td></tr><tr><td>VN</td><td>mln m3</td><td>575</td></tr><tr><td>VNG</td><td>mln m3</td><td>619</td></tr></table>
Justification of the choice of data or description of measurement methods and procedures (to be) applied	APG historical volume is needed for baseline emissions calculation.
QC/QA procedures (to be) applied	Reference data based on actual data for period 2000-2003/ Used conservative value from 2003 year/In order to estimate the baseline of the project we adopted the maximum volume of historically utilized APG in old pipeline infrastructure achieved before new construction and reconstruction gas pipelines in 2004. It should be noted that for the estimation of the base volume of APG we assumed the conservative scenario where as the basis we took maximum values (for last year 2003 in trend) for historical period 2000-2003.
Any comment	-

Data/Parameter	Global Warming Potential of Methane (GWP CH_4)
Data unit	tCO_2e/tCH_4.
Description	GWP CH_4 is necessary to calculate the CH_4 emission factor due to APG flaring
Time of determination/monitoring	Once, during determination
Source of data (to be) used	Decision 2/CP.3 http://unfccc.int/resource/docs/cop3/07a01.pdf#page=31 Climate Change 1995, The Science of Climate Change: Summary for Policymakers and Technical Summary of the Working Group I Report, page 22. http://unfccc.int/ghg_data/items/3825.php

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	**GWP CH_4 is necessary to calculate the CH_4 emission factor due to APG flaring**
QC/QA procedures (to be) applied	-
Any comment	

Data/Parameter	ρ_{CO2}
Data unit	Kg/m^3
Description	Density of CO_2 under standard conditions
Time of determination/monitoring	Once, during determination
Source of data (to be) used	Thermal calculation of boilers (Normative method), NPO CKTI, St. Petersburg, 1998
Value of data applied (for ex-ante calculations/determinations)	1.842
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Density of CO_2 is needed to calculate the CO_2 emission factor due to APG flaring
QC/QA procedures (to be) applied	-
Any comment	-

Data/Parameter	ρ_{CH4}
Data unit	kg/m^3
Description	Density of methane at standard conditions
Time of determination/monitoring	Determined once during the preparation of project design document
Source of data (to be) used	Thermal calculation of boilers (Normative method), NPO CKTI, St. Petersburg, 1998
Value of data applied (for ex-ante calculations/determinations)	0.668
Justification of the choice of data or description of measurement methods and procedures (to be) applied	-
QC/QA procedures (to be) applied	Determined on the basis of the reference data
Any comment	

Data/Parameter	**Nc**
Data unit	unit
Description	Quantity of carbon moles in a mole of a component of APG
Time of determination/monitoring	constant
Source of data (to be) used	Chemical formulae
Value of data applied	Carbon dioxide, CO2: 1

(for ex-ante calculations/determinations)	methane, CH_4	1
	ethane, C_2H_6	2
	propane, C_3H_8	3
	i-butane, C_4H_{10}	4
	n-butane, C_4H_{10}	4
	i-pentane, C_5H_{12}	5
	c-pentane, C_5H_{12}	5
	n-pentane, C_5H_{12}	5
	hexane, C_6H_{14}	6
	geptane, C_7H_{16}	7
	octane, C_8H_{18}	8
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Quantity of carbon moles in a mole of a component of APG is needed to calculate the CO_2 emission factor due to the combustion of the APG.	
QC/QA procedures (to be) applied	Reference data	
Any comment	-	

Data/Parameter	ε
Data unit	Fractions
Description	Unburned carbon factor for soot combustion of APG in flare units
Time of determination/monitoring	Annual
Source of data (to be) used	IPCC 2006
Value of data applied (for ex ante calculations/determinations)	0.02 (2%)
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Recommendations underburning factor 2%
QA/QC procedures (to be) applied	Based on reference data
Any comment	-

The parameters monitored directly

Data/Parameter	FC_{APG_PJ}
Data unit	Ths.m3 (under standard conditions)
Description	The main source of baseline emissions. This APG would be burned at the flare under the baseline.
Time of determination/monitoring	Monthly
Source of data (to be) used	Flow gas meter

Value of data applied (for ex ante calculations/determinations)	**2008**: 3357264; **2009**: 4125706; **2010**: 4502442; **2011**: 4968525; **2012**: 5424568
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Data of 2008-2011 is actual, for 2012 is estimated.
QA/QC procedures (to be) applied	The main measuring instruments are calibrated and verified by "Tyumen Center for Standardization, Metrology and Certification"
Any comment	Using a sum of monthly volume APG as the annuals does not lead to a distortion of the result.

2008	2009	2010	2011	2012
3357264	4125706	4502442	4968525	5424568

Data/Parameter	W_{CO2}, W_{CH4} W_{VOC}
Data unit	%
Description	Necessary for calculating emissions when APG is flared at CCP
Time of determination/monitoring	Monthly
Source of data (to be) used	Flow Gas Chromatograph
Value of data applied (for ex ante calculations/determinations)	see table below
Justification of the choice of data or description of measurement methods and procedures (to be) applied	The parameter values for 2008-2011 are based on actual data. The values for 2012 are based on average annual values of 2008-2011.
QA/QC procedures (to be) applied	The instrument is calibrated and verified by "Tyumen Center for Standardization, Metrology and Certification"
Any comment	

Carbon dioxide, CO2	0,57%
methane, CH4	70,90%
ethane, C2H6	5,31%
propane, C3H8	13,00%
i-butane, C4H10	2,41%
n-butane, C4H10	3,43%
neo-pentane C5H12	0,00%
i-pentane, C5H12	1,12%
n-pentane, C5H12	1,00%
hexane, C6H14	0,73%
geptane, C7H16	0,30%
octane, C8H18	0,00%
Nonane C9H20	0,00%
Decan C10H22	0,00%
u-decan C11H24	0,00%
hydrogen sulfide, H2S	0,00%
nitrogen, N2	1,20%

Annex 3

MONITORING PLAN