CONTROL AND MONITORING OF GREENHOUSE GAS EMISSIONS IN JSC GAZPROM

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GAZPROM

Binding Russia to establish a nationwide system of state regulation, Kyoto Protocol major provisions serve as a guiding basis for our country's major greenhouse gas emitters including JSC Gazprom
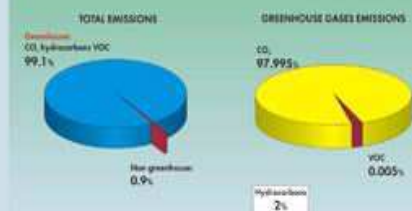
The Company's energy intensity is the second-largest in fuel-and-power sector of Russia and its activities make certain impact on the environment. The main volumes of carbon dioxide (CO_2) and methane (CH_4) atmospheric emission by Gazprom are shown in Fig.1

The creation of system of greenhouse gases emission assessment and monitoring covering legal aspects, quality measurement issues and their registration, calibration and management is the priority line in JSC Gazprom activity

Gazprom should meet the following challenges at present:

- Complete preparatory work to create infrastructure needed for entering the "carbonic market";
- Complete greenhouse gas emission inventory;
- Introduce corporate system of emissions measurement and control;

- Prepare a feasibility study for "carbonic projects";
- Provide an independent evaluation of potential carbonic projects (validation);
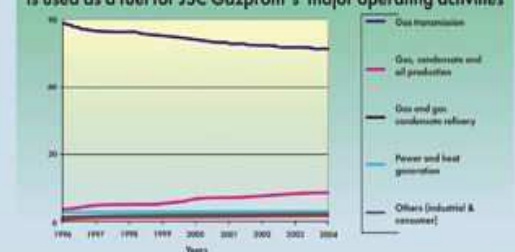- Create corporate governance arrangements for managing "carbonic" investments.

Total greenhouse gases emissions (CH_4+CO_2) and dynamics of CO_2 emissions when the hydrocarbons are used as fuel for JSC Gazprom shown in Fig. 2 and 3

Fig.1 The structure of atmospheric emissions by Gazprom in 2005

TOTAL EMISSIONS
Greenhouse CO, hydrocarbons VOC
99.1%

Non greenhouse 0.9%

GREENHOUSE GASES EMISSIONS
CO_2 97.995%

VOC 0.005%

Hydrocarbons 2%

Fig.2 Total CO_2 and CH_4 emissions by hydrocarbon fuels in 1990 - 2012 timeframe

1 – actual emissions CO_2+CH_4;
2 – prognosis (base line);
3 – prognosis (in case additional measures for CO_2 and CH_4 reduction are implemented)

Gazprom's greenhouse gas emissions inventory consists of several levels:
- Determining the baseline, scope and limits;
- Performing inventory (beginning in 1990 until now);
- Compiling and register;
- Providing an independent international assessment and expertise.

Fig. 3 Dynamics of CO_2 emissions when the natural gas is used as a fuel for JSC Gazprom's major operating activities

- Gas transmission
- Gas, condensate and oil production
- Gas and gas condensate refinery
- Power and heat generation
- Others (industrial & consumer)

Cooperative researches of Russian and foreign experts confirmed that methane volumes emitted by the Russian gas transmission system are much lower than normative values. Natural gas leakages volumes of JSC Gazprom are less than 1% of transported gas volumes (Fig.4 and 5)

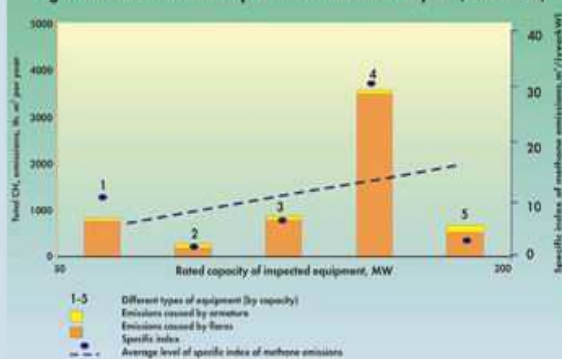Fig.4 Methane emissions by different classes of objects (estimated)

Rated capacity of inspected equipment, MW

1-5 Different types of equipment (by capacity)
Emissions caused by armature
Emissions caused by flares
Specific index
Average level of specific index of methane emissions

Fig.5 Total JSC Gazprom greenhouse gas emissions in 2004

Methane	bln m^3 per year	5,9
	In mln t per year of CO_2 equivalent	86,7
CO_2 while natural gas is burnt mln t per year		102,5
Total, mln t per year (in CO_2 equivalent)		189,2

Fundamentals of JSC Gazprom corporate system of emissions measurement and control are:

- Selection of calculation (measurements) methods and of the procedure for data input and quality control (with provision of cross-checks during the data gathering process);
- Book-keeping of the information on greenhouse gases emissions;
- Reduction of uncertainty (sources category level and base level);
- Automated system for greenhouse gases emissions registration;
- Russian and foreign companies experience.