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:

"Realization of a complex of energy saving activities at the OJSC "Kazanorgsintez".

Sector Scope[1]: 1 Energy industries (renewable/non-renewable resources) and 5 Chemical industries.

Version: 08.

Date: 29 June 2011.

A.2. Description of the project:

Open Joint Stock Company "Kazanorgsintez" is one of the largest chemical enterprises in the Russian Federation. OJSC "Kazanorgsintez" produces more than 38% of Russian polyethylene and this is biggest exporter of its. The company occupies a leading position in the production of pipeline polyethylene pipes, phenol, acetone, antifreeze, chemicals for oil and natural gas dehydration. Annually OJSC "Kazanorgsintez" produces more than 1(one) million tons of chemical products.

An important stage of chemical industry development in the USSR was “May” Plenum of the CPSU Central Committee (1958), where it was decided to accelerate the development of chemical industry. Directorate of Kazan chemical plant was determined and approved by RSFSR Council of Ministers Decision at July14,1958. First Stage plant industrial objects constructing was started in 1959. First trading unit of phenol and acetone was obtained July 13,1963. Plant was quickly developed from start-up, it was realized a number of large-scale manufacturing facilities modernization.

Production technology of basic organic synthesis, inorganic products, polymers and products from them, realized by OJSC "Kazanorgsintez", due to the specific manufacturing processes is associated with generation, emissions and discharges of harmful substances into the environment. Thereby the company pays much attention to environmental protection problems. Company’s business model is aimed to minimization of negative impact on the environment. Company activities perform in conformity with the environmental legislation of Russian Federation and Republic of Tatarstan. Plans, aimed at reducing the harmful effects of the objects of exploitation on the environment, the rational use of water resources and protection of water bodies, have developed and implemented annually.

Project history goes back to 2000, when at the meeting of Technical Council of OJSC "Kazanorgsintez" it was made a decision to provide large-scale modernization of the enterprise to improve efficiency of manufacturing. Taking into account the opportunities of fund usage on modernization of manufacturing at the expense of join implementation mechanisms, by guidance of the OJSC "Kazanorgsintez", were initiated the adoption of the join implementation project "Realization of a complex of energy saving activities at the OJSC "Kazanorgsintez".

[1] http://ji.unfccc.int/AIEs/List.html

First stage of realization of the project under the results of the Technical Council session was resolution about conclusion of contracts with a firm "Tenkimont International SA" (Italy) for the installation of two packaging machines "Kompakta 1300" instead of older and more energy-intensive machinery; and with the firm "Maveg Industrieanlagen GmbH" (Germany) for the installation of integrated particulate concentrate production line.

At the plant was designed, approved and implemented "Energy Saving Program in 2000-2005" for successful implementation of a joint implementation project. In 2006, was developed and approved "Program of resource efficiency, 2006-2010", which became a logical continuation of earlier acting program. The results of running these programs appear in the annual reports that are published on the official site of OJSC "Kazanorgsintez"[1].

In the absence of project activity the baseline scenario for OJSC "Kazanorgsintez" was to maintain existing at the beginning of 2000 equipment in good condition, herewith the consumption of energy for manufacturing and, consequently, greenhouse gas emissions into the environment would remain constant at 2000 levels.

Project activities are aimed to the improving of the enterprise efficiency by modernizing of 8 production types, such as: ethylene Stage I, ethylene Stage II, ethylene Stage III, ethylene Stage IV, high density polyethylene (hereinafter - HDPE), low-density polyethylene (hereinafter - LDPE) Stage II, LDPE Stage III, phenol.

The main goal of implementing of the planned manufacturing efficiency improving activities on OJSC "Kazanorgsintez" is to reduce the combustion of natural gas used for thermal and electricity energy producing for industrial needs of the enterprise that will reduce greenhouse gas emissions.

The result of this project was initiated in 2000 phased modernization of OJSC "Kazanorgsintez" production facilities, the above. The aim of modernization is the installation of high efficient equipment that will reduce the flow of heat and electricity for production, thus will reduce the volume of natural gas combustion to produce heat and electricity. The main supplier of thermal energy for OJSC "Kazanorgsintez" is the CHP-3, Kazan. Reducing thermal energy consumption in the manufacturing process will reduce the amount of natural gas combustion for heat generation the CHP-3, Kazan. Reducing of the electricity consumption for the OJSC "Kazanorgsintez" manufacturing processes will reduce the amount of fossil fuel consumption by power plants of the Russian Federation that supply electricity to the grid of Russia.

[1] http://www.kazanorgsintez.ru/index.php?page=content&id=66

A.3. Project participants:

Party involved*	Legal entity project participant (as applicable)	Please indicate if the Party involved wishes to be considered as project participant (Yes/No)
Russian Federation (Host Party)	• OJSC " Kazanorgsintez "	No
Great Britain	• Company "SIC GLOBAL LLP"	No
*Please indicate if the Party involved is a host Party.		

A.4. Technical description of the project:

A.4.1. Location of the project:

The project is located on the territory of OJSC "Kazanorgsintez". The company is located in Kazan, the capital of the Tatarstan Republic of the Russian Federation. Kazan is situated on the Volga River, about 800 km east of Moscow. The industrial complex is located about 15 km north-west of the city center. Geographic location of the project is indicated in figure 1.

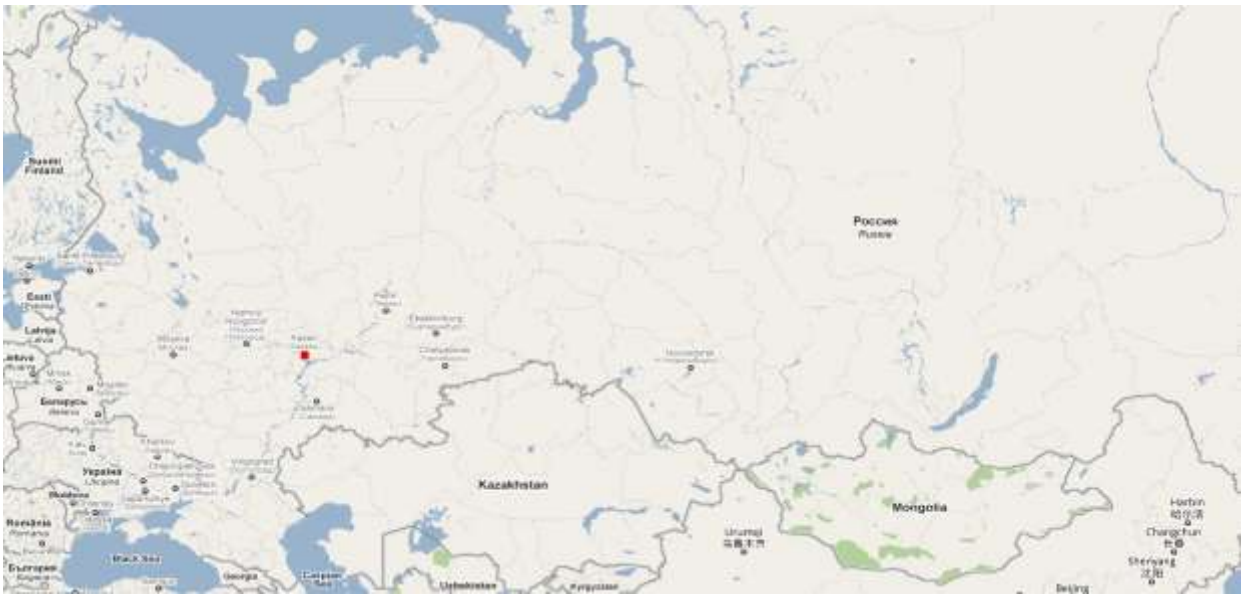

Figure 1 – Geographic location of the project

A.4.1.1. Host Party(ies):

Russian Federation

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

The Republic of Tatarstan

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

Kazan city

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

The project is located on the territory of OJSC "Kazanorgsintez". The enterprise is located on the in Kazan, the capital of the Republic of Tatarstan of the Russian Federation. Kazan is situated on the Volga River, about 800 km east of Moscow. The industrial complex is located about 15 miles north-west of downtown. The territory of the enterprise is 4,2 km^2 (single industrial site). Total number of employees is more than 9000 people.

The area of OJSC "Kazanorgsintez" manufacturing facilities is shown on figure 2.

Figure 2 - Area of OJSC "Kazanorgsintez" manufacturing facilities

Geographic coordinates location of the OJSC "Kazanorgsintez"[1]:
- 55º 47' 27" North latitude;
- 49º 6' 52" East longitude.

[1] http://maps.google.com/maps?hl=en&tab=wl

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

Project activities are aimed to the company energy efficiency improving through the implementation of the complex of energy-saving measures for 8 types of production. The implementation of planned activities will reduce costs for electrical and thermal energy used for production process, thereby reduce amount of fossil fuel consumption by power plants of Russian Federation.

1. Modernization of ethylene production of Stages I, II, III and IV

Ethylene production of Stages I and II runs on liquefied hydrocarbon raw materials - propane-butane fraction (hereinafter – PBF), and if necessary, a mixture of PBF and a broad fraction of light hydrocarbons (hereinafter – BFLH). Production of ethylene Stages III and IV runs on gas raw-materials - ethane fraction.

I and II ethylene Stages are based on the pyrolysis of liquefied hydrocarbons – PBF (if necessary, on a mixture of PBF and BFLH), Stages III and IV runs on gas raw-materials - ethane, with the pyrogas obtaining in tube furnaces.

Installations are differentiated on two types accordingly to the method of pyrogas separation:
- I Stage pyrolysis of ethylene proceeds by absorption-distillation method. In the absorption-stripping column where comes butane-absorbent is going stripping of methane-hydrogen fraction and the absorption of the heavier hydrocarbons. The process of distillation and absorption takes place at a moderate cooling condition with using propylene-coolant with temperatures up to -30 °C;
- II, III and IV Stages pyrolysis process proceeds by low-temperature distillation using propylene and ethylene refrigeration cycles with temperatures up to -100 °C.

Reduction of electrical and thermal energy relative consumption per ton of ethylene will be provided through the following modernization activities, which were realized during the period 2000-2010:

Production of ethylene Stage I:

- reconstruction of the pyrolysis furnace № 4 (project CJSC "Techneftehim" Moscow, Russia).

It is expected that implementation of the ethylene I Stage reconstruction will allow to reduce the relative consumption of electric energy to 0,294 MW•h per 1 ton of ethylene, and thermal energy to 1,034 Gcal per 1 ton of ethylene.

Timetable for the implementation of energy efficiency improving measures for ethylene production Stage I is given in the table below.

Name of the phase	Beginning of work	Completion of work
Reconstruction of the pyrolysis furnace № 4-4	01/08/2002	12/03/2004

Production of ethylene Stage II:

- usage of a catalyst "Ethoxy-111-P-1" in the hydrogenation reactor V-123 (project of the company JSC RDE “Oksit” Moscow, Russia);

- commissioning of the two-chamber furnace P-510/515 (the project of "Teknip Benelux" company, Netherlands);

- reconstruction of the pyrolysis furnace №5 (the project of "Teknip Benelux" company, Netherlands).

It is expected that the implementation of these measures to modernize the production of ethylene Stage II allow to reduce the relative consumption of electric energy to 0,472 MW•h per 1 ton of ethylene, and thermal energy to 0,316 Gcal per 1 ton of ethylene.

Timetable for the implementation of energy efficiency improving measures for ethylene production Stage II is given in the table below.

Name of the phase	Beginning of work	Completion of work
Usage of a catalyst "Ethoxy-111-P-1" in the hydrogenation reactor V-123	10/07/2000	12/04/2001
Commissioning of the two-chamber furnace P-510/515	15/04/2005	18/12/2007
Commissioning of the pyrogas water washing assembly and steam dilution assembly	15/04/2005	11/11/2009

Production of ethylene Stage III:

- reconstruction of the pyrolysis furnace P-1/5 (the Project of JSC "VNIPIneft", Moscow, Russia);

- reconstruction of gas separation E-100 (the project of "Elliot", USA).

It is expected that the implementation of these measures to modernize the production of ethylene Stage III will allow to reduce the relative consumption of electric energy to 0,091 MW•h per 1 ton of ethylene. These activities will have no impact on the thermal energy consumption.

Timetable for the implementation of energy efficiency improving measures for ethylene production Stage III is given in the table below.

Name of the phase	Beginning of work	Completion of work
Reconstruction of the furnace pyrolysis P-1/5	28/04/2004	19/07/2007
Reconstruction of gas separation E-100	15/04/2005	06/08/2010

Production of ethylene Stage IV:

- reconstruction of the pyrolysis furnace $P\text{-}101_4$ (the Project of JSC "VNIPIneft", Moscow, Russia);

- commissioning of the ethylene compressor B-404C (the project of OJSC "Nevsky Plant", St. Petersburg, Russia);

- reconstruction of the ethylene column K-303 (the project of «Koch-Glitsch GmbH", Switzerland).

It is expected that implementation of these modernization activities of ethylene production Stage IV will allow to reduce relative consumption of electric energy to 0,574 MW•h per 1 ton of ethylene, and thermal energy to 0,762 Gcal per 1 ton of ethylene.

Timetable for the implementation of energy efficiency improving measures for ethylene production Stage IV is given in the table below.

Name of the phase	Beginning of work	Completion of work
Reconstruction of the pyrolysis furnace P-101_4	02/11/2001	18/07/2002
Commissioning of the ethylene compressor B-404C	12/12/2006	04/04/2008
Reconstruction of the ethylene column K-303	23/07/2007	19/10/2009

2. Modernization of HDPE production

The manufacturing process of HDPE consists of the following stages:
- preparation (cleaning) of raw materials;
- polymerization of ethylene.

Preparation of raw materials is to clean up raw materials (ethylene, butene-1, hexene-1, nitrogen, isopentane) from acetylene, carbon monoxide, carbon dioxide, oxygen and moisture. One production line provides a clean raw material for three independent polymerization lines “A", "B" and "C".

Getting HDPE is providing by gas-phase method at temperature 85-112 °C and pressure 19-21,4 kg/cm^2 with using of catalysts.

Each production line includes following components:
- reactor block, including compressing and circulating gas cooling assemblies;
- catalyst feed assembly;
- reaction suppression assembly.

Polymerization reaction runs in a reactor - vertical cylindrical unit volume of 539 m^3. Fluidized layer of polymer powder is created by a continuous flow of circulating gas through the distribution grid of the reactor. There’re air cooler (on the line “B”) and water cooler (on lines “A” and “C”) on the circulation gas line, they’re intended for extraction of ethylene polymerization heat. Feeding of isopentane (forced condensation agent) to the pipeline on lines "A" and "C” is intended to increase circulating gas density in order to increase dewpoint, cooling rate in the refrigerator and productivity of the reactor.

Unloading of powder from the reactor is carried out periodically through the capacity for product unloading and blow-down tank (on the line "B"). On the lines "A" and "C" it’s provided two-stage powder unloading, which consists of two product chambers and two blow-down tanks. For removing of hexene-1 from the polymer powder on the lines "A" and "C" it’s provided polymer blow-down chamber of 450 m^3. Further, polyethylene powder has transferred by pneumatic conveyer to the interim storage.

Obtained polyethylene powder goes to the compounding line in order to improve its properties and obtain the finished product with desired quality characteristics. Compounding process includes melting of polyethylene and mixing a polymer melt with stabilizers, dispersing the latter, equable allocation of stabilizer in the polymer, granulation. This process provides in two-stage mixing and extrusion assemblies on the basis of two-rotor mixer.

Reduction of electricity and thermal energy relative consumption per ton of HDPE will be provided through the following modernization activities, which were realized in the period 2000-2008:

- new energy-efficient equipment installing;
- modernization of the reactor block;
- modernization of the reactor cleanup.

In the development of HDPE modernization production projects participated following leading international, European and Russian firms: "Teknimont International S.A." (Italy), "Theysohn" (Germany), "Libraverk Mashynfabryk GmbX" (Germany), "Toyo Engineering Corporation" (Japan), OJSC "Samarneftechimpromproekt" (Samara, Russia), "Coperion" (Germany).

It is expected that implementation of these measures to modernize the production of HDPE will allow to reduce relative consumption of electric energy to 0,130 MW•h per 1 ton of HDPE, and thermal energy to 0,500 Gcal per 1 ton of HDPE.

Timetable for the implementation of energy efficiency improving measures HDPE production is given in the table below.

Name of the phase	Beginning of work	Completion of work
New energy efficient equipment installing	25/09/2000	15/12/2008
Modernization of the reactor block	13/08/2004	24/10/2007
Modernization of the reactor cleanup	13/08/2004	24/10/2007

3. Modernization of LDPE production Stage II

PLDPE (production of Low-density polyethylene) provides by the polymerization of ethylene in the autoclave reactor with a mixer at pressure of 110-160 MPa and temperature of 157-280 °C with using organic peroxides as the initiators. Polyethylene production consists of four identical technological lines, each of which is an independent set of devices. In the process stream includes the following major components: a booster compressor, two compressors of the second stage, the reactor, separators for high and low pressure extrusion granulation unit of the primary system of bunkers, mixing, storage and processing of polyethylene pneumatic.

Ethylene from the gas separation plant with a concentration not less than 99,9% comes into the polymerization assembly by the pipeline. Ethylene goes by pipeline from the accumulator of fresh ethylene to the bunker of fresh ethylene, where it mixes with recurrent low-pressure ethylene, which is fed by booster compressor. Recurrent ethylene from low pressure separator goes to the receiver, working under the pressure of 0,025-0,045 MPa. From the tank the gas mixture goes to the booster compressor. Booster compressor feeds gas mixture in the tank, where it is mixed with fresh gas from the gas separation plant. From the mixing tank gas goes to the first stage compressor through two filters that work in rotation. Ethylene, compressed by first stage compressor up to 17-28 MPa, goes into the mixer, were it's mixing with recurrent high pressure gas from the separators. Further, the mixer gas passes through two high pressure filters that work in rotation and sent to the suction of second stage compressor. The working gas from the compression assembly goes in 4 lines that joint in pairs at the inlet of reactor. The temperature at the reactor inlet, depending on the type of obtained polyethylene, is supported by the cooling water feeding (10-50 °C) to the working gas pipelines' jacket. Ethylene polymerization goes in the reactor, the heat of reaction have extracted mainly by polyethylene-ethylene flow, and additionally, if necessary, by cold air feeding to the jacket of reactor. The pressure in reactor is automatically regulated at the specified level affecting Fisher valve that is positioned on the output of gas-polyethylene mix from

this device; the temperature in the reactor is maintained automatically by feeding of the initiators that obtained by pumps productivity changing. Fisher valve reduces the pressure of the reaction mixture from working level up to 25 MPa. Under this pressure and temperature from 157 to 280 °C, depending on the type of polyethylene, reactionary mixture comes to the product refrigerator. From the product refrigerator mixture "polyethylene-ethylene" goes into high pressure separator where non-reacted ethylene separation process goes. From this device polyethylene melt with a small amount of ethylene goes to low pressure separator, ethylene gas from the separator enters recurrent-type coolers to reduce the temperature. Further, the melt passes through a gate-type shutoff valve and then to extruder filling zone. Extruder is intended for mixing and feeding of polyethylene melt under pressure through a die to the cutting blades of granulator. Granulated polyethylene supplied to the polyethylene mixing zone for analysis and averaging of polyethylene. After averaging and analysis polyethylene can be directed to the storage of finished products or for further processing.

Reduction of relative consumption of electricity and thermal energy per ton of LDPE Stage II will be provided through the following activities on modernization, which were performed in the period 2000-2008:

- installation of new packaging machines “Compacta” (project of "Teknimont", Italy);

- installation of the product cooler to the technological line number №3 (project of "Defort", Saint-Petersburg, Russia);

- installation of the product cooler to the technological line number №1 (project of "Defort", Saint-Petersburg, Russia);

- installation of the product cooler to the technological line number 2 (project of "Defort", Saint-Petersburg, Russia).

It is expected that implementation of these measures to modernize LDPE production Stage II will allow to reduce relative consumption of electric energy to 0,055 MW•h per 1 ton of LDPE and thermal energy to 0,417 Gcal per 1 ton of LDPE.

Timetable for the implementation of energy efficiency improving measures LDPE production Stage II is given in the table below.

Name of the phase	Beginning of work	Completion of work
Installation of new packaging machines “Compacta”	25/09/2000	05/04/2001
Installation of the grocery refrigerator on the technological line № 3	04/12/2003	24/06/2005
Installation of the product cooler on the technological line number 1	04/12/2003	22/06/2007
Installation of the product cooler on the technological line number 2	04/12/2003	22/04/2008

4. Modernization of LDPE production Stage III

The process of polymerization of ethylene carried out in a tubular reactor at a pressure of 230 MPa and temperature up to 300 °C. As the initiator of the polymerization process uses oxygen. Regulation properties of polyethylene by changing process parameters and modifier (propane) adding. Process flow consists of following elements: preparation of the working gas (ethylene mixed with oxygen and propane) and stepped compressing of it to the working pressure; oxygen dosage unit; dosage of propane unit, ethylene polymerization, separation of non-reacted gas, granulation and analyzing station, cleaning and cooling of high pressure recycle gas, recycle low pressure gas cleaning and cooling, hot water station, hydraulic drive oil, nitrogen compression unit.

Fresh ethylene, which coming from the ethylene collector with pressure 1,6-3,3 MPa and a temperature 5-40 °C, passes through the valves where the pressure is throttled up to 1,25-1,65 MPa and fed to 2 identical process lines . Part of the fresh ethylene after the valve is applied to oxygen dosage unit for the preparation of ethylene-oxygen mixture; the remaining major part is combined with return ethylene filed booster compressor and enters the receiver. From the receiver the gas passes through the filter and enters the suction first-stage compressor of the first Stage. Ethylene, compressed by first Stage compressor is mixed with recycle high pressure gas, the required quantity of which is fed to the mixing, modifier (propane) from a propane station. Mixing propane gas recycle high pressure is produced in the mixer. The stream of mixed ethylene (working gas) through the metal-ceramic filters are supplied to the compressor suction of the second stage, pre-divided into 2 streams, conventionally called - "cold" and "hot " gas. Working gas containing modifier and an initiator, compressed by compressor to pressure 230 MPa, two streams flow through the buffer tank to polymerization. Two buffer tanks are connected to each other in order to equalize the pressure pumping by second stage compressor and to change the ratio between the "hot" and "cold" flows. The "hot" flow enters the heat exchanger, where it is heated to a temperature of initiation of polymerization reactions 170-200 °C. Cold stream of ethylene after the compressor second stage enters the heat exchanger, which cools circulating water to a temperature of 20-50 °C. Obtained polyethylene in a mixture with non-reacted ethylene passes through a cooling zone of the reactor, then enters high pressure separator (HPS), where goes separation of polyethylene from the non-reacted gas. Coming out of the HPS polyethylene melt enters the low pressure separator. From the tank of low pressure polyethylene melt enters the extruder. Melt polyethylene screw extruder is fed to starting valve, which feeds on the polyethylene pellet. The melt is extruded through a perforated plate, it goes to die where have cut and then goes to granulator. Granules taken up by transporting water and served in the pre-water separator, which removed 80% of water, goes to centrifuge, where run final separation of water. Then granules go to the analyzing station, from which they can be delivered to the warehouse of finished products.

Reduction of relative consumption of electricity and thermal energy per ton of LDPE Stage III will be provided through the following activities on modernization, which were performed in the period 2000-2008:

- installation of packaging machines “Compacta” (project of "Teknimont", Italy);

- installation and start-up of lithium-bromide refrigerator ABHM for ethylene cooling in side streams refrigerators (project of OJSC "Kemerovohimmash", Kemerovo, Russia; and the firm "Burkhard", Switzerland);

- reconstruction of the compressor II in the technological line "A" (project of OJSC "Plastopolimer", Saint-Petersburg, Russia);

- commissioning of a plate heat exchanger on fresh ethylene to suction compressor I cascade supply line on two technological lines (project of "Alfa-Laval", France).

It is expected that the implementation of these measures to modernize the LDPE production Stage III will allow to reduce relative consumption of electric energy to 0,120 MW•h per 1 ton of LDPE and thermal energy at 0,243 Gcal per 1 ton of LDPE.

Timetable for the implementation of energy efficiency improving measures LDPE production Stage III is given in the table below.

Name of the phase	Beginning of work	Completion of work
Installation of packaging machines “Compacta”	25/09/2000	05/04/2001
Installation and start-up of lithium-bromide refrigerator ABHM ethylene cooling in side streams refrigerators	30/11/2005	29/09/2007
Reconstruction of Compressor II at the technological line "A"	12/08/2008	20/09/2008
Commissioning of plate heat exchanger on fresh ethylene to suction compressor I cascade supply line (on two technological lines)	28/06/2007	15/09/2008

5. Modernization of phenol production

Production of phenol and acetone by the method of co-production of phenol and acetone by isopropylbenzene hydroperoxide, known as "Cymene method ", commissioned in 1963.

Production of phenol and acetone comprises following steps:
- isopropylbenzene (cymene) obtaining by alkylation of benzene with propylene in the presence of aluminum chloride;
- oxidation of cymene by atmospheric oxygen to obtain technical cymene hydroperoxide;
- decomposition of cymene hydroperoxide to phenol and acetone, phenol production and processing.

Reduction of alternative consumption of electricity and thermal energy per ton of phenol occurs by performing following modernization activities, which were performed during 2000-2009:

- way to implement a phenolic resin - phenol production waste in railway tanks at ambient temperature below 0 °C (the project of OJSC "Kazanorgsintez");

- implementation works to stabilize the phenol production productivity (project of OJSC "Sintezkauchukproekt", Voronezh, Russia);

- reduction of steam flow pressure 1,3 MPa by supplying steam condensate from the first section of oxidation tower № 2.1-6 in the steam satellites system (the project of OJSC "Kazanorgsintez");

- optimization of tradable phenol obtaining process by excluding of distillation column from the technological scheme (project of OJSC "Kazanorgsintez");

- replacement of steam ejection pumps to liquid-ring vacuum pumps (project of OJSC "Sintezkauchukproekt", Voronezh, Russia);

- reduction of steam flow pressure 1,3 MPa by supplying steam condensate in the steam satellites system (project of OJSC "Kazanorgsintez").

It is expected that implementation of these measures to modernize the production of phenol will allow to reduce relative consumption of thermal energy to 2,369 Gcal per 1 ton of phenol and electricity relative consumption will rise to 0,040 MW•h per 1 ton of phenol.

Timetable for the implementation of measures to improve phenol production energy efficiency is given in the table below.

Name of the phase	Beginning of work	Completion of work
Way to implement a phenolic resin - phenol production waste in railway tanks at ambient temperature below 0 °C	24/01/2000	17/03/2003
Implementation of stabilization activities on the performance of phenol production	25/07/2006	02/10/2006
Reduction of steam flow pressure 1,3 MPa by supplying steam condensate from the first section of oxidation tower № 2.1-6 in the steam satellites system	27/11/2007	14/11/2008
Optimization of tradable phenol obtaining process by excluding of distillation column from the technological scheme	24/10/2008	14/09/2009
Replacement of steam ejection pumps to liquid-ring vacuum pumps	29/08/2008	16/06/2009
Reduction of steam flow pressure 1,3 MPa by supplying steam condensate in the steam satellites system	29/09/2008	16/12/2008

Realizing of energy efficiency measures contemplates implementation of new, technically sophisticated equipment with a high automatization level, which requires highly skilled staff to achieve planned energy efficiency requires.

Leading global and European firms as well as Russian companies' experts were invited for consulting and designing of modernization projects

In order to minimize potential problems associated with lack of experience, our specialists regularly undergoing trainings to improve their skills, take part in industry seminars and conferences.

Qualified personnel of OJSC "Kazanorgsintez" and company's leadership concernment in the implementation of joint implementation project is a guarantee of the successful implementation this Project.

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:

Open Joint Stock Company "Kazanorgsintez" is one of the largest chemical enterprises in the Russian Federation. OJSC "Kazanorgsintez" produces more than 38% of Russian polyethylene and this is biggest exporter of its. The company occupies a leading position in the production of pipeline polyethylene pipes, phenol, acetone, antifreeze, chemicals for oil and natural gas dehydration.

Production technology of basic organic synthesis, inorganic products, polymers and products from them, realized by OJSC "Kazanorgsintez", due to the specific manufacturing processes is associated with generation, emissions and discharges of harmful substances into the environment.

Production of OJSC "Kazanorgsintez" is a very energy intensive. Greenhouse gas emissions occur as a result of burning fossil fuels to produce heat and electricity for industrial needs of the enterprise. Emission reductions will occur through the implementation of measures for modernization of production, planned by the project. Measures on modernization of production will reduce the flaring of natural gas for heat production at Kazan CHP-3, which is a major supplier of thermal energy OJSC "Kazanorgsintez", as well as reduce the amount of fossil fuel for electricity power plants in Russia, which supply electricity to power system of the Russian Federation.

In accordance with the technological scheme, production of OJSC "Kazanorgsintez" requires the consumption of significant amounts of heat energy that comes from Kazan CHP-3, and electrical energy, which comes from the electrical grid of the Russian Federation. The proposed project will reduce the relative consumption of heat and electricity per ton of production OJSC "Kazanorgsintez". Reduction of relative consumption of heat and electricity for production will lead to a decline in fossil fuel power plants of the Russian Federation for the production of heat and electricity. Reduction of fossil fuel consumption would reduce emissions of greenhouse gases into the environment that occur as a result of burning fossil fuels.

All planned under the project activities require for its execution significant financial resources. In part, compensation cost for the project to be produced by reducing energy consumption. However, this mechanism of investment returning makes it possible to perform only minor, low-cost measures to upgrade.

To carry out planned activities in full, in both own financial resources of the enterprise and credit resources of Russian banks are involved, which is unprofitable because of high interest rates for their use. Ability to attract investment through the mechanisms of joint implementation enables management of the company to include in the project those activities that cannot be financed without the financial means to OJSC "Kazanorgsintez" expects to receive from the sale of emission reduction units.

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

	Years
Length of the crediting period	5
Year	Estimate of annual emission reductions in tonnes of CO_2 equivalent
2008	257 815
2009	270 929
2010	284 839
2011	349 292
2012	348 153
Total estimated emission reductions over the crediting period (tonnes of CO_2 equivalent)	1 511 028
Annual average of estimated emission reductions over the crediting period (tonnes of CO_2 equivalent)	302 206

A.5. Project approval by the Parties involved:

According to Russian legislation, the approval letter will be prepared by Russian government on the basis of expert opinion issued by an accredited independent organization after the completion of the draft determination, in accordance with the procedure of approval of joint implementation projects, which taken at the international and Russian level.

Letter of endorsement from a party other than the Russian Federation, will also be prepared to completion of the project determination procedure.

SECTION B. Baseline

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

For this project, the baseline scenario was chosen in accordance with the "Guidance on criteria for baseline setting and monitoring" (Version 02)[1]. In accordance with the requirements of this document, the choice of the baseline scenario may be based on a particular approach, which applies only to a specific project of joint implementation, or on a standard approach in the application which used the methodology, including small-scale, which are approved by the Supervisory Committee for JI Projects.

Since the measures on modernization of production, provided the project is not described in any of the approved methodologies, then select the baseline scenario has been chosen a specific approach. In accordance with the requirements of the "Guidance on criteria for baseline setting and monitoring" (Version 02) for such projects based on a specific approach for determining the baseline scenario may include some elements of the methodologies that are approved by the Supervisory Committee for JI projects. To determine the baseline scenario of this project have been used some elements of the approved consolidated methodology ACM0012 "Consolidated baseline methodology for GHG emission reductions from waste energy recovery projects" (Version 3.2)[2]. This methodology provides a complete or partial replacement of electrical and/or thermal energy produced from fossil fuels for electricity and/or thermal energy produced from renewable energy sources. Since this project is no substitution of electricity and heat from renewable energy sources, then this methodology cannot be applied fully to the project of joint implementation. This project aims to reduce the unit cost of heat and electricity in the production process OJSC "Kazanorgsintez". Methodology ACM0012 "Consolidated baseline methodology for GHG emission reductions from waste energy recovery projects" (Version 3.2) will be applied to this project in terms of calculating the amount of greenhouse gas emissions, based on data on consumption of electricity and thermal energy produced from fossil fuels, on the production of OJSC "Kazanorgsintez".

The choice of the baseline scenario is based on determining the most likely among the possible participants of the project alternative scenarios that can ensure the production of comparable quality by preventing reduction of production volumes, and meet the requirements of current legislation of the Russian Federation.

The baseline scenario of this project was selected through the following steps:
1. Defining a realistic and effective alternative;
2. Exclusion of alternatives that do not meet the requirements of the applicable laws and regulations;
3. Exclusion of alternatives for which there are excessive obstacles.

Step 1. Defining a realistic and effective alternatives

[1] http://ji.unfccc.int/Ref/Documents/Baseline_setting_and_monitoring.pdf
[2] http://cdm.unfccc.int/UserManagement/FileStorage/0M4N9567GH1J7UAJ89YNQ299K1MYSI

As the project involves the phased implementation of joint large-scale modernization of production OJSC "Kazanorgsintez", to determine the baseline scenario have been selected two most likely alternatives to the project activity.

Alternative 1.1	Continuation of existing situation at the enterprise without the implementation of measures to improve energy efficiency
Alternative 1.2	Implementation of the planned project activities in the absence of the benefits of joint implementation

1.1 Continuation of existing situation at the enterprise without the implementation of measures to improve energy efficiency

With this alternative, the company will not implement the modernization of production facilities. OJSC "Kazanorgsintez" will continue to consume electricity and heat required for the production of products, from energy companies of the Russian Federation in the same volume.

1.2 Implementation of the planned project activities in the absence of the benefits of joint implementation

This alternative provides for the execution of all activities related to modernization, but without the benefits of joint implementation. OJSC "Kazanorgsintez" will continue to consume electricity and heat required for the production of products, from energy companies of the Russian Federation, but in much smaller volumes.

Step 2. Exclusion of alternatives that do not meet the requirements of the applicable laws and regulations

All of the above alternatives do not contradict the requirements of current legislation and relevant regulations.

Both alternatives are involved in the further consideration.

Step 3. Exclusion of alternatives for which there are excessive barriers

Sub-step 3a. Financial barriers

In an alternative 1.1 No significant financial barriers, the company does not require upgrading. Financial resources will be spent only to maintain production facilities in working condition.

Alternative 1.2 is not financially attractive without the use of joint implementation. Implementation of this alternative requires significant large-scale modernization of the enterprise and, consequently, significant financial investment that can bring out through the joint implementation project.

Sub-step 3b. Technological barriers

At 1.1 there is no alternative to the technological barriers, the company does not require upgrading in the future may use technological equipment, adhering to the relevant manuals and performing routine repairs.

Alternative 1.2 requires substantial modernization of the enterprise. The project is implemented a new, technologically sophisticated equipment, with a high level of automation, which is planned to achieve energy efficiency requires highly skilled staff.

The choice of the baseline scenario

After doing 3 steps was determined the most likely scenario, the continuation of the existing situation at the enterprise without the implementation of measures to improve energy efficiency provided by the project (an alternative to 1.1) - is the basic scenario for the proposed project for joint implementation. Alternative 1.2 was removed in step 3, as an alternative for which there is excessive obstacles (financial and technological barriers).

Key information and data used to establish the baseline are provided below in tabular form:

<table>
<tr><td>Data/Parameter</td><td colspan="2">$EF_{co2,elec}$</td></tr>
<tr><td>Data unit</td><td colspan="2">t $CO_{2\,e}$/ MW·h</td></tr>
<tr><td>Description</td><td colspan="2">Emission factor for the energy system of the Russian Federation</td></tr>
<tr><td>Time of determination/monitoring</td><td colspan="2">Annually. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs</td></tr>
<tr><td>Source of data (to be) used</td><td colspan="2">"Operational Guidelines for Project Design Documents of Joint Implementation Projects. Volume 1: General guidelines. Version 2.3. Ministry of Economic Affairs of the Netherlands." 2004</td></tr>
<tr><td>Value of data applied
(for ex ante calculations determinations)</td><td colspan="2"><table><tr><td>Year</td><td>t $CO_{2\,e}$/ MW·h</td></tr><tr><td>2008</td><td>0,565</td></tr><tr><td>2009</td><td>0,557</td></tr><tr><td>2010</td><td>0,550</td></tr><tr><td>2011</td><td>0,542</td></tr><tr><td>2012</td><td>0,534</td></tr></table></td></tr>
<tr><td>Justification of the choice of data or description of measurement methods and procedures (to be) applied</td><td colspan="2">Emission factor for the energy system of the Russian Federation was determined by tender ERUPT Ministry Economics of the Netherlands</td></tr>
<tr><td>QA/QC procedures (to be) applied</td><td colspan="2">"Operational Guidelines for Project Design Documents of Joint Implementation Projects. Volume 1: General guidelines." subject to periodic review and amendment to it, if necessary, corrective data</td></tr>
<tr><td>Any comment</td><td colspan="2">-</td></tr>
</table>

Data/Parameter	η
Data unit	%
Description	Energy efficiency (efficiency) of the energy company that provides thermal energy production OJSC "Kazanorgsintez"
Time of determination/monitoring	Annually. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source of data (to be) used	"Tool to determine the baseline efficiency of thermal or electric energy generation systems" (Version 01)[1]
Value of data applied (for ex ante calculations determinations)	92
Justification of the choice of data or description of measurement methods and procedures (to be) applied	This parameter is defined in accordance with the requirements of the "Tool to determine the baseline efficiency of thermal or electric energy generation systems" (Version 01)[1]
QA/QC procedures (to be) applied	"Tool to determine the baseline efficiency of thermal or electric energy generation systems" is subject to periodic review and amendment of it, when necessary, appropriate corrective data
Any comment	-

Data/Parameter	$OXID_{NG}$
Data unit	%
Description	Share of non-oxidized carbon natural gas
Time of determination/monitoring	Annually. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source of data (to be) used	"National report on inventories of anthropogenic emissions by sources and removals by sinks of greenhouse gases not controlled by the Montreal Protocol for the 1990-2006 " (hereinafter - "The National inventory report")[2]
Value of data applied (for ex ante calculations determinations)	99,5
Justification of the choice of data or description of measurement methods and procedures (to be) applied	This parameter is defined in accordance with the data of the National inventory report "
QA/QC procedures (to be) applied	"The National inventory report" is subject to periodic review and amendment of it, when necessary, appropriate corrective data
Any comment	-

[1] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-09-v1.pdf
[2] http://meteorf.ru/rgm2.aspx?RgmFolderID=a3a18a39-6add-4a84-90e6-348d39736130

Data/Parameter	W_{NG}
Data unit	t C/TJ
Description	The carbon content in natural gas
Time of determination/monitoring	Annually. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source of data (to be) used	"The National inventory report"
Value of data applied (for ex ante calculations determinations)	15,15
Justification of the choice of data or description of measurement methods and procedures (to be) applied	This parameter is defined in accordance with the data of the "National inventory report"
QA/QC procedures (to be) applied	"The National inventory report" is subject to periodic review and amendment of it, when necessary, appropriate corrective data
Any comment	-

Data/Parameter	P_1
Data unit	t
Description	Quantity produced ethylene Stage I
Time of determination/monitoring	Monthly. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source of data (to be) used	Measurement
Value of data applied (for ex ante calculations determinations)	Projected production of ethylene Stage I

Year	t
2008	39 167
2009	36 577
2010	33 843
2011	35 000
2012	35 000

Justification of the choice of data or description of measurement methods and procedures (to be) applied	Measuring the amount of ethylene produced by the Stage I by the relevant means of measurement
QA/QC procedures (to be) applied	Measurement tools that are used when performing the measurements, subject to periodic verification or calibration
Any comment	-

Data/Parameter	P_2

Data unit	t
Description	Quantity produced ethylene Stage II
Time of determination/monitoring	Monthly. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source of data (to be) used	Measurement
Value of data applied (for ex ante calculations determinations)	Projected production of ethylene Stage II

Year	t
2008	52 317
2009	42 616
2010	35 322
2011	60 446
2012	60 446

Justification of the choice of data or description of measurement methods and procedures (to be) applied	Measuring the amount of ethylene produced by the Stage II by the relevant means of measurement
QA/QC procedures (to be) applied	Measurement tools that are used when performing the measurements, subject to periodic verification or calibration
Any comment	-

Data/Parameter	P_3
Data unit	t
Description	Quantity produced ethylene Stage III
Time of determination/monitoring	Monthly. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source of data (to be) used	Measurement
Value of data applied (for ex ante calculations determinations)	Projected production of ethylene Stage III

Year	t
2008	96 684
2009	105 204
2010	77 665
2011	110 840
2012	110 840

Justification of the choice of data or description of measurement methods and procedures (to be) applied	Measuring the amount of ethylene produced by the Stage III by the relevant means of measurement
QA/QC procedures (to be) applied	Measurement tools that are used when performing the measurements, subject to periodic verification or calibration
Any comment	-

Data/Parameter	P_4
Data unit	t

Description	Quantity produced ethylene Stage IV
Time of determination/monitoring	Monthly. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source of data (to be) used	Measurement
Value of data applied (for ex ante calculations determinations)	Projected production of ethylene Stage IV

Year	t
2008	221 942
2009	225 930
2010	221 139
2011	282 273
2012	282 273

Justification of the choice of data or description of measurement methods and procedures (to be) applied	Measuring the amount of ethylene produced by the Stage IV by the relevant means of measurement
QA/QC procedures (to be) applied	Measurement tools that are used when performing the measurements, subject to periodic verification or calibration
Any comment	-

Data/Parameter	P_5
Data unit	t
Description	Quantity produced HDPE
Time of determination/monitoring	Monthly. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source of data (to be) used	Measurement
Value of data applied (for ex ante calculations determinations)	Projected production of HDPE

Year	t
2008	320 761,064
2009	365 143,662
2010	376 720,236
2011	467 250,000
2012	474 100,000

Justification of the choice of data or description of measurement methods and procedures (to be) applied	Measuring the amount of HDPE produced by appropriate means of measuring
QA/QC procedures (to be) applied	Measurement tools that are used when performing the measurements, subject to periodic verification or calibration
Any comment	-

Data/Parameter	P_6
Data unit	t
Description	Quantity produced LDPE Stage II
Time of determination/monitoring	Monthly. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source of data (to be) used	Measurement
Value of data applied (for ex ante calculations determinations)	Projected production of LDPE Stage II

Year	t
2008	76 341,800
2009	73 228,300
2010	67 832,300
2011	77 000,000
2012	77 000,000

Justification of the choice of data or description of measurement methods and procedures (to be) applied	Measuring the amount produced by LDPE Stage II can be performed by appropriate means of measurement
QA/QC procedures (to be) applied	Measurement tools that are used when performing the measurements, subject to periodic verification or calibration
Any comment	-

Data/Parameter	P_7
Data unit	t
Description	Quantity produced LDPE Stage III
Time of determination/monitoring	Monthly. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source of data (to be) used	Measurement
Value of data applied (for ex ante calculations determinations)	Projected production of LDPE Stage III

Year	t
2008	129 320,300
2009	140 045,500
2010	132 167,000
2011	140 000,000
2012	140 000,000

Justification of the choice of data or description of measurement methods and procedures (to be) applied	Measuring the amount produced by LDPE Stage III can be performed by appropriate means of measurement
QA/QC procedures (to be) applied	Measurement tools that are used when performing the measurements, subject to periodic verification or calibration
Any comment	-

Data/Parameter	P_8

Data unit	t
Description	Amount of produced phenol
Time of determination/monitoring	Monthly. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source of data (to be) used	Measurement
Value of data applied (for ex ante calculations determinations)	Projected production of phenol

Year	t
2008	54 058
2009	51 707
2010	60 508
2011	65 000
2012	65 000

Justification of the choice of data or description of measurement methods and procedures (to be) applied	Measuring the amount of phenol produced by the relevant means of measurement
QA/QC procedures (to be) applied	Measurement tools that are used when performing the measurements, subject to periodic verification or calibration
Any comment	-

Data/Parameter	$SEC_{1,elec}$
Data unit	MW·h/t
Description	Specific consumption of electrical energy for the production of ethylene Stage I
Time of determination/monitoring	Fixed value. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source of data (to be) used	For this option was taken a fixed value based on historical data of ethylene production Stage I for 3 years (from 1999 to 2001) before the start of the project activity
Value of data applied (for ex ante calculations determinations)	1,956
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Fixed value
QA/QC procedures (to be) applied	-
Any comment	-

Data/Parameter	$SEC_{2,elec}$

Data unit	MW·h/t
Description	Specific consumption of electrical energy for the production of ethylene Stage II
Time of determination/monitoring	Fixed value. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source of data (to be) used	For this option was taken a fixed value based on historical data of ethylene production Stage II for 3 years (from 1997 to 1999) before the start of the project activity
Value of data applied (for ex ante calculations determinations)	2,447
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Fixed value
QA/QC procedures (to be) applied	-
Any comment	-

Data/Parameter	$SEC_{3,elec}$
Data unit	MW·h/t
Description	Specific consumption of electrical energy for the production of ethylene Stage III
Time of determination/monitoring	Fixed value. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source of data (to be) used	For this option was taken a fixed value based on historical data of ethylene production Stage III for 3 years (from 2001 to 2003) before the start of the project activity
Value of data applied (for ex ante calculations determinations)	1,637
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Fixed value
QA/QC procedures (to be) applied	-
Any comment	-

Data/Parameter	$SEC_{4,elec}$
Data unit	MW·h/t

Description	Specific consumption of electrical energy for the production of ethylene Stage IV
Time of determination/monitoring	Fixed value. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source of data (to be) used	For this option was taken a fixed value based on historical data of ethylene production Stage IV for 3 years (from 1998 to 2000) before the start of the project activity
Value of data applied (for ex ante calculations determinations)	1,732
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Fixed value
QA/QC procedures (to be) applied	-
Any comment	-

Data/Parameter	$SEC_{5,elec}$
Data unit	MW·h/t
Description	Specific consumption of electrical energy for the production of HDPE
Time of determination/monitoring	Fixed value. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source of data (to be) used	For this option was taken a fixed value based on historical data of production HDPE for 3 years (from 1997 to 1999) before the start of the project activity
Value of data applied (for ex ante calculations determinations)	0,533
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Fixed value
QA/QC procedures (to be) applied	-
Any comment	-

Data/Parameter	$SEC_{6,elec}$
Data unit	MW·h/t
Description	Specific consumption of electrical energy for the production of

	LDPE Stage II
Time of determination/monitoring	Fixed value. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source of data (to be) used	For this option was taken a fixed value based on historical data of production LDPE Stage II for 3 years (from 1997 to 1999) before the start of the project activity
Value of data applied (for ex ante calculations determinations)	1,001
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Fixed value
QA/QC procedures (to be) applied	-
Any comment	-

Data/Parameter	$SEC_{7,elec}$
Data unit	MW·h/t
Description	Specific consumption of electrical energy for the production of LDPE Stage III
Time of determination/monitoring	Fixed value. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source of data (to be) used	For this option was taken a fixed value based on historical data of production LDPE Stage III for 3 years (from 1997 to 1999) before the start of the project activity
Value of data applied (for ex ante calculations determinations)	1,041
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Fixed value
QA/QC procedures (to be) applied	-
Any comment	-

Data/Parameter	$SEC_{8,elec}$
Data unit	MW·h/t
Description	Specific consumption of electrical energy for the production of phenol

Time of determination/monitoring	Fixed value. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source of data (to be) used	For this option was taken a fixed value based on historical data of production of phenol for 3 years (from 1997 to 1999) before the start of the project activity
Value of data applied (for ex ante calculations determinations)	0,029
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Fixed value
QA/QC procedures (to be) applied	-
Any comment	-

Data/Parameter	$SEC_{1,term}$
Data unit	Gcal/t
Description	Specific consumption of heat energy for the production of ethylene Stage I
Time of determination/monitoring	Fixed value. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source of data (to be) used	For this option was taken a fixed value based on historical data of ethylene production Stage I for 3 years (from 1999 to 2001) before the start of the project activity
Value of data applied (for ex ante calculations determinations)	4,486
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Fixed value
QA/QC procedures (to be) applied	-
Any comment	-

Data/Parameter	$SEC_{2,term}$
Data unit	Gcal/t
Description	Specific consumption of heat energy for the production of ethylene Stage II
Time of determination/monitoring	Fixed value. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs

Source of data (to be) used	For this option was taken a fixed value based on historical data of ethylene production Stage II for 3 years (from 1997 to 1999) before the start of the project activity
Value of data applied (for ex ante calculations determinations)	2,519
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Fixed value
QA/QC procedures (to be) applied	-
Any comment	-

Data/Parameter	$SEC_{3,term}$
Data unit	Gcal/t
Description	Specific consumption of heat energy for the production of ethylene Stage III
Time of determination/monitoring	Fixed value. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source of data (to be) used	For this option was taken a fixed value based on historical data of ethylene production Stage III for 3 years (from 2001 to 2003) before the start of the project activity
Value of data applied (for ex ante calculations determinations)	1,619
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Fixed value
QA/QC procedures (to be) applied	-
Any comment	-

Data/Parameter	$SEC_{4,term}$
Data unit	Gcal/t
Description	Specific consumption of heat energy for the production of ethylene Stage IV
Time of determination/monitoring	Fixed value. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source of data (to be) used	For this option was taken a fixed value based on historical data of ethylene production Stage IV for 3 years (from 1998 to 2000)

	before the start of the project activity
Value of data applied (for ex ante calculations determinations)	1,955
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Fixed value
QA/QC procedures (to be) applied	-
Any comment	-

Data/Parameter	$SEC_{5,term}$
Data unit	Gcal/t
Description	Specific consumption of heat energy for the production of HDPE
Time of determination/monitoring	Fixed value. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source of data (to be) used	For this option was taken a fixed value based on historical data of production HDPE for 3 years (from 1997 to 1999) before the start of the project activity
Value of data applied (for ex ante calculations determinations)	0,576
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Fixed value
QA/QC procedures (to be) applied	-
Any comment	-

Data/Parameter	$SEC_{6,term}$
Data unit	Gcal/t
Description	Specific consumption of heat energy for the production of LDPE Stage II
Time of determination/monitoring	Fixed value. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source of data (to be) used	For this option was taken a fixed value based on historical data of production LDPE Stage II for 3 years (from 1997 to 1999) before

	the start of the project activity
Value of data applied (for ex ante calculations determinations)	0,589
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Fixed value
QA/QC procedures (to be) applied	-
Any comment	-

Data/Parameter	$SEC_{7,term}$
Data unit	Gcal/t
Description	Specific consumption of heat energy for the production of LDPE Stage III
Time of determination/monitoring	Fixed value. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source of data (to be) used	For this option was taken a fixed value based on historical data of LDPE production Stage III for 3 years (from 1997 to 1999) before the start of the project activity
Value of data applied (for ex ante calculations determinations)	0,629
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Fixed value
QA/QC procedures (to be) applied	-
Any comment	-

Data/Parameter	$SEC_{8,term}$
Data unit	Gcal/t
Description	Specific consumption of heat energy for the production of phenol
Time of determination/monitoring	Fixed value. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source of data (to be) used	For this option was taken a fixed value based on historical data of production of phenol for 3 years (from 1997 to 1999) before the start of the project activity
Value of data applied (for ex ante calculations determinations)	9,245
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Fixed value
QA/QC procedures (to be) applied	-
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:

Greenhouse gas emissions in the baseline and project scenarios of this project are formed due to the consumption of electricity and heat in the production process OJSC "Kazanorgsintez", namely: greenhouse gas emissions produced by burning fossil fuels in thermal and electrical energy. Source of emissions of this project are the production capacities of OJSC "Kazanorgsintez" indirect source of emissions are energy enterprises of the Russian Federation. Emission reductions will be achieved by reducing specific consumption of heat and electricity in the production process OJSC "Kazanorgsintez. Reduction of specific consumption of heat and electricity will reduce the overall consumption of energy consumed for production, thereby reducing the amount of fossil fuel (natural gas) to produce electricity and heat energy enterprises of the Russian Federation. The decline in fuel combustion to produce heat and electricity will reduce emissions of greenhouse gases.

It is important to note that the implementation of measures to improve energy efficiency of the enterprise OJSC "Kazanorgsintez" will reduce greenhouse gas emissions that cannot be achieved in the absence of a joint implementation project. OJSC "Kazanorgsintez" does not receive financial benefits from reducing greenhouse gas emissions. Therefore, any reduction in greenhouse gas emissions to be achieved within the framework of joint implementation will be additional.

Additionality of the project has been evaluated in accordance with the requirements of "Tool for the demonstration and assessment of additionality" (Version 05.2)[1]. This method uses a step by step assessment of additionally.

Step 1: Identification of alternatives to the project activity consistent with current laws and regulations

Sub-step 1a: Define alternatives to the project activity

As defined in Section B.1 of this document, except for the proposed joint implementation project was set to 2 more options:
1 Continuation of existing situation at the enterprise without the implementation of measures to improve energy efficiency;
2 Implementation of the planned project activities in the absence of the benefits of joint implementation.

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

These alternatives to the project activity were taken as realistic, and not inconsistent with the law.

In accordance with applicable Russian legislation reducing greenhouse gas emissions from sources is not required. The National Policy of the Russian Federation in the field of emissions of harmful substances into the environment is regulated by federal law "On Environment Protection"[2] from 10.01.2002 № 7-FZ. This Act does not set specific requirements on greenhouse gas emissions in the industry.

Step 2: Investment analysis

Sub-step 2a: Determine appropriate analysis method

"Method for the demonstration and assessment of additionality" (Version 5.2) provides three options for investment analysis:
Option I. Simple cost analysis;
Option II. Investment comparison analysis;
Option III. Benchmark analysis.

The proposed project provides other benefits besides revenue from the sale of emission reductions under the joint implementation mechanism, so the option I to the draft does not apply.

The selected baseline scenario "Continuation of the existing situation at the enterprise without the implementation of measures to improve energy efficiency" does not provide investment, so the option II of this project is not applicable.

Given the above, an adequate method of analysis was option III.

Sub-step 2b. Option I. Apply simple cost analysis

[1] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v5.2.pdf
[2] http://duma.consultant.ru/page.aspx?8550;707563

Not applicable.

Sub-step 2b. Option II. Apply investment comparison analysis

Not applicable.

Sub-step 2b. Option III. Apply benchmark analysis

To perform all activities related to modernization of the plant under the project required an investment of 173,728 million euros, including:

Coded activities	Name of Phase	Cost, million Euro
1	2	3
01_01	Reconstruction of the pyrolysis furnace № P4-4 ethylene production Stage I	0,037
02_01	Usage of catalyst "Ethoxy-111-P-1" in the hydrogenation reactor V-123 ethylene production Stage II	0,169
02_02	Commissioning of the two-chamber furnace P-510/515 ethylene production Stage II	10,097
02_03	Commissioning of the host water wash and pyro gas node receiving steam dilution of ethylene production Stage II	3,126
03_01	Reconstruction of the pyrolysis furnace P-1/5 of ethylene production Stage III	1,179
03_02	Reconstruction of gas separation E-100 of ethylene production Stage III	18,720
04_01	Reconstruction of the pyrolysis furnaces P-101_4 ethylene production Stage IV	1,359
04_02	Commissioning of ethylene compressor B-404C	1,486
04_03	Reconstruction of the ethylene column K-303 of ethylene production Stage IV	
05_01	Installing new energy-efficient equipment for the production of HDPE	61,200
05_02	Modernization of the reactor block the production of HDPE	15,700
05_03	Modernization of production reactor cleaning HDPE	3,700
06_01	The introduction of new Packaging and packaging machines “Compacta” production LDPE Stage II	0,245
06_02	Installation of the grocery refrigerator on the technological line number 3 production LDPE Stage II	0,114
06_03	Installation of the grocery refrigerator on the technological line number 1 production line LDPE Stage II	0,096
06_04	Installation of the grocery refrigerator on the technological line number 2 production line LDPE Stage II	0,034
07_01	The introduction of new Packaging and packaging machines Compact production line LDPE Stage III	0,207
07_02	Installation and start-lithium bromide absorption chiller ABHM for refrigeration of ethylene in cold side flow LDPE production line Stage III	0,319
07_03	Reconstruction Compressor II at the technological line "A" LDPE production line Stage III	0,439

1	2	3
07_04	Commissioning of the plate heat exchanger on the supply lines of fresh ethylene suction compressor I cascade two of the technological line of LDPE production Stage III	0,012
08_01	Way to implement a phenolic resin - phenol production waste in railway tanks at ambient temperature below 0 °C	0,001
08_02	Implementation of works to stabilize the performance of production of phenol	55,440
08_03	Reduction of steam pressure of 1,3 MPa by supplying steam condensate from the first section of the tower № 2.1-6 oxidation in the steam system of satellites production of phenol	0,002
08_04	Optimizing the process of obtaining trademark of phenol by excluding from the technological scheme of the distillation column	0,004
08_05	Replacing the steam ejection pumps liquid ring vacuum pumps production of phenol	0,037
08_06	Reduction of steam pressure of 1,3 MPa by supplying steam condensate in the steam system of satellites production of phenol	0,005
	Total	**173,728**

Execution of all planned activities to modernize production facilities will reduce the energy consumption of the following:
- electric energy;
- thermal energy.

Through the implementation of the project is expected to save heat energy in the range of 20,000 Gcal per year at the beginning of the project and up to 850,000 Gcal per year on completion of all planned activities to upgrade. In accordance with the financial statements of OJSC "Kazanorgsintez" cost of thermal energy fluctuated during the period of design activity from 3,2 to 22,5 EUR per 1 Gcal of heat energy. The expected profit of OJSC "Kazanorgsintez" of thermal energy savings range from 0,1 million euros at the start of the project to 20 million euros on completion of all planned activities for the modernization of production.

Through the implementation of the project savings of electric energy is expected within 85 000 MWh per year at the beginning of the project and up to 375 000 MWh per year on completion of all planned activities to upgrade. In accordance with the financial statements of OJSC "Kazanorgsintez" cost of electricity fluctuated during the period of design activity from 10,6 to 41,8 Euro per 1 MWh of thermal energy. The expected profit of OJSC "Kazanorgsintez" from saving electricity from 1,5 million Euro at the start of the project to 16 million euros on completion of all planned activities for the modernization of production.

Data of the OJSC "Kazanorgsintez" energy costs listed in the Table below.

Year	Electricity cost, rub/Mw•h	Thermal energy cost, rub/Gcal	Electricity cost, euro/Mw•h	Thermal energy cost, euro/Gcal
2000	424,81	127,54	10,62	3,19
2001	539,55	155,51	13,49	3,89
2002	660,11	195,74	16,50	4,89
2003	612,96	244,13	15,32	6,10
2004	790,46	300,36	19,76	7,51
2005	941,50	340,77	23,54	8,52
2006	706,85	411,19	17,67	10,28
2007	855,51	525,13	21,39	13,13
2008	1 087,82	693,87	27,20	17,35
2009	1 282,31	862,57	32,06	21,56
2010	1 676,71	844,07	41,92	21,10
2011	1 710,24	860,95	42,76	21,52
2012	1 744,45	878,17	43,61	21,95

Mentioned herein prices, rates and investment costs are exclusive of VAT.

Reference point was chosen rate of return on equity OJSC "Kazanorgsintez". In accordance with the financial statements of the enterprise the average rate of return on equity OJSC "Kazanorgsintez" is 20%. For this project, for the discount rate adopted by the minimum rate of return on equity OJSC "Kazanorgsintez", which was 12%.

Based on the above data for the proposed joint implementation project was calculated internal rate of return (IRR) for the expected period of credit, which amounted to 10,4%. The reference point of the project is lower than the chosen reference point; this indicates that the project is not financially attractive.

When calculating the internal rate of return was recorded residual value of project assets in the calculation of financial flows in the last year of the project.

To calculate the predicted energy costs in subsequent periods were applied inflation projection based on historical data for past periods.

Sub-step 2c: Calculation and comparison of financial indicators (only applicable to options II and III)

Financial indicators of the net present value (NPV) and Internal Rate of Return (IRR) were calculated for two variants: with and without the use of joint implementation.

Used for calculating the discount rate 12%, this corresponds to the minimum rate of return on equity OJSC «Kazanorgsintez». Financial indicators were calculated for a period expected crediting period.

For the calculation of financial indicators for the project activity is taking advantage of joint implementation has been calculated the expected profit from the sale of emission reduction units at a price of 10 euro per 1 ton $CO_{2\,e}$.

Simple payback period (SPP) with and without the use of joint implementation was 8 years old.

The calculated values of NPV and IRR for the two options listed in the table below.

	Without the use of joint implementation	With the use of joint implementation
NPV, million euros	-4,898	0,167
IRR, %	10,4	12,1

As follows from the calculations, without the use of joint implementation project is not attractive for investment, but the use of joint implementation can improve its investment attractiveness. Thus, we can conclude that joint implementation project is additional.

Sub-step 2d: Sensitivity analysis (only applicable to Options II and III)

The proposed project is largely dependent on energy costs. To return on the project without the use of joint implementation has reached the level of the project with the benefits of joint implementation of energy costs should raise significantly. Increasing energy prices is not beneficial for the company since this will lead to a rise in price of production. In calculating the financial indicators were taken into account possible increase of energy.

The sensitivity of the project was estimated in the range of ± 10% change in the cost of energy.

	-10%	0%	+10%
NPV, million euros	-7,223	-4,898	-2,164
IRR, %	9,6	10,4	11,3

It follows from these calculations, the project does not become attractive for investment even rise in price of energy in the future. Thus, we can conclude that the draft joint implementation is additional.

Step 3: Barrier analysis

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

1. Financial barriers

The project activity is not financially attractive without the use of joint implementation. Implementation of this project requires a large-scale modernization of the enterprise and financial investments. Financial condition of the enterprise cannot achieve the planned activities for modernization without attracting credit resources of Russian banks, which is unprofitable because of high interest rates. OJSC "Kazanorgsintez" enters the group of companies OJSC "TAIF" and has no right to freely dispose of financial resources without the consent of the planned investments with the OJSC "TAIF" executives, i.e. the executives of OJSC "Kazanorgsintez" have limited access to capital. Only the possibility of obtaining funds from the sale of emission reduction units generated by the project, will convince the executives of OJSC "TAIF" accomplish the planned project activities in full.

2. Technological barriers

The project activity requires substantial modernization of production facilities. The project is implemented a new, technically sophisticated equipment with a high level of automation, which is scheduled to meet energy efficiency demands highly qualified personnel.

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

No financial or technological barriers will not prevent the baseline scenario. The company has not needed investments in modernization. The baseline scenario the company does not require upgrading in the future may use technological equipment, adhering to the relevant manuals and performing routine repairs.

Joint implementation would involve financial resources to implement planned project activities for the modernization of production, which would eliminate the financial barriers for the project. Attraction to the project of highly qualified specialists of leading world and European firms, as well as leading Russian companies will minimize the technological barriers for the joint implementation project.

Step 4: Common practice analysis

Sub-step 4a: Analyze other activities similar to the proposed project activity

Projects to implement complex energy efficiency measure the chemical industry, similar proposals in Russia were not observed.

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

Other similar projects are not satisfied.

Outcome: The implementation of the project will reduce greenhouse gas emissions into the environment that cannot be achieved in the absence of the project. Any reduction in emissions of harmful substances into the environment, which will be achieved within the framework of the joint implementation project, will be an extra.

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

In the scope of the project included the following sources of direct emissions:
- manufacture of ethylene Stage I;
- manufacture of ethylene Stage II;
- manufacture of ethylene Stage III;
- manufacture of ethylene Stage IV;
- manufacture of HDPE;
- manufacture of LDPE Stage II;
- manufacture of LDPE Stage III;
- manufacture of phenol.

As an indirect emissions include enterprises of the energy sector of the Russian Federation, which produce heat and electricity for the sources of direct emissions, located within the boundaries of the project.

Spatial boundaries of the project include a physical (geographic) location of the emission source. Project boundaries coincide with physical boundaries of the enterprise OJSC "Kazanorgsintez" and energy enterprises of the Russian Federation, which produce electricity and heat production to meet the needs of OJSC "Kazanorgsintez". The boundaries of the project relate to the region, which contains data of the enterprise. Schematically boundaries of the project are shown in Figure 3.

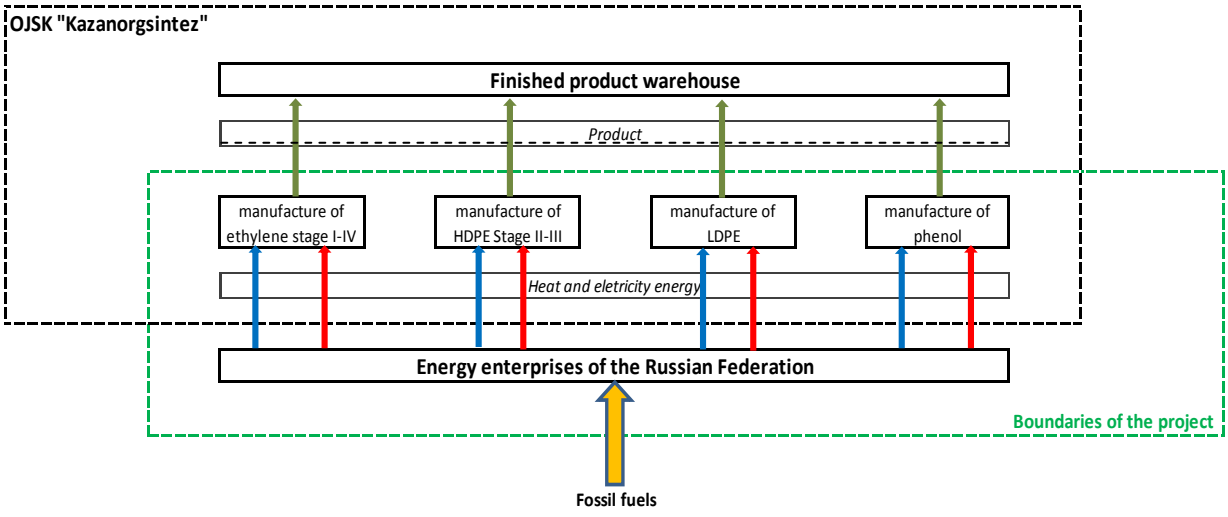

Figure 3 – Boundaries of the project

	Source	Gas	Enabled?	Justification / Explanation
The baseline scenario	Heat consumption for production	CO_2	Yes	The main source of emissions
		CH_4	No	Minor emissions Conservative approach
		N_2O	No	Minor emissions Conservative approach
	Electric energy consumption for production	CO_2	Yes	The main source of emissions
		CH_4	No	Minor emissions Conservative approach
		N_2O	No	Minor emissions Conservative approach
Project scenario	Heat consumption for production	CO_2	Yes	The main source of emissions
		CH_4	No	Minor emissions Conservative approach
		N_2O	No	Minor emissions Conservative approach
	Electric energy consumption for production	CO_2	Yes	The main source of emissions
		CH_4	No	Minor emissions Conservative approach
		N_2O	No	Minor emissions Conservative approach

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

Date of baseline setting: 27/01/2011.

Individuals who have set a baseline scenario:

Name of organization: "SIC GLOBAL LLP" - a project participant
Address: Great James street, 23-24
City: London
Country: United Kingdom
Contact: Kolyesnikov Viktor Viktorovitch
Position: SIC representative
Phone: +380 68 1292233
Fax: +380 44 5692403
Email: vicv@bigmir.net

SECTION C. Duration of the project / crediting period

C.1. Starting date of the project:

The proposed JI project consists of several stages of the implementation of measures to improve energy efficiency of production OJSC "Kazanorgsintez".

Launch date of the joint implementation project is the date of packaging and packaging machines "Compacta 1300" commissioning instead of older, more energy-intensive machines.

Based on the protocol guarantee tests that were performed by "Tenkimont International SA (Italy), packaging and packaging machines "Compacta 1300" were put into operation. Guarantee tests were conducted from 04 till 05 April, 2001

Launch date of the joint implementation project is April 5, 2001.

C.2. Expected operational lifetime of the project:

Expected operational lifetime of the project is at least 20 years (240 months).

C.3. Length of the crediting period:

5 (five) years, which is sixty (60) months.

The beginning of the crediting period starts from January 1, 2008. In the period from 1 January, 2008 to December 31, 2012 will be generated by emission reduction units (ERUs).

SECTION D. Monitoring plan

D.1. Description of monitoring plan chosen:

The monitoring plan of the joint implementation project was selected in accordance with the "Guidance on criteria for baseline setting and monitoring"(Version 02). The monitoring plan was based on a particular approach, which applies only to a specific project for joint implementation.

Since the measures on modernization of production, provided the project is not described in any of the approved methodologies, then the choice of the monitoring plan has been chosen a specific approach. In accordance with the requirements of the "Guidance on criteria for baseline setting and monitoring" (Version 02) for such projects based on a specific approach for determining the monitoring plan may include some elements of the methodologies that are approved by the Supervisory Committee for JI projects. To determine the monitoring plan of the project has been used some elements of the approved consolidated methodology ACM0012 “Consolidated baseline methodology for GHG emission reductions from waste energy recovery projects” (Version 3.2)
This methodology provides a complete or partial replacement of electrical and / or thermal energy produced from fossil fuels for electricity and/or thermal energy produced from renewable energy sources. Since this project is no substitution of electricity and heat from renewable energy sources, then this methodology cannot be applied fully to the project of joint implementation. This project aims to reduce the unit cost of heat and electricity in the production process OJSC "Kazanorgsintez". Methodology ACM0012 “Consolidated baseline methodology for GHG emission reductions from waste energy recovery projects” (Version 3.2) will be applied to this project in terms of calculating the amount of greenhouse gas emissions, based on data on consumption of electricity and thermal energy produced from fossil fuels, on the production of OJSC "Kazanorgsintez".

The monitoring plan adopted for the joint implementation project being implemented, has the task of ensuring the availability of all data needed to determine the level of emissions in the baseline and project scenarios, and, accordingly, emission reduction units from joint implementation of the project, information about which is provided in previous sections.

To monitor the data used means of measurement, which entered into the State register of measuring instruments of the Russian Federation. Measuring tools must be verified or calibrated periodically.

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
1	2	3	4	5	6	7	8	9
1. EC_i	amount of electrical energy that is consumed for the production of i-th type of product	Meter	MW•h	m	Monthly	1	electronically and on paper	data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
2. $EF_{co2,elec}$	emission factor for the energy system of the Russian Federation	"Operational Guidelines for Project Design Documents of Joint Implementation Projects. Volume 1: General guidelines. Version 2.3. Ministry of Economic Affairs of the Netherlands." 2004	t CO_2 e/ MW•h	e	Annually	1	electronically and on paper	The same

1	2	3	4	5	6	7	8	9
3. HC_i	amount of heat energy that is consumed for the production of i-th type of product	Metering of heat energy	Gcal	m	Monthly	1	electronically and on paper	The same
4. η	efficiency (efficiency) of the energy company that provides thermal energy production	"Consolidated baseline methodology for GHG emission reductions from waste energy recovery projects"	%	e	Annually	1	electronically and on paper	The same
5. $OXID_{NG}$	fraction of unoxidized carbon natural gas	"The National inventory report"	%	e	Annually	1	electronically and on paper	The same
6. W_{NG}	The carbon content in natural gas	"The National inventory report"	t C/TJ	e	Annually	1	electronically and on paper	The same

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

Emissions in the project scenario are calculated as follows:

$$PE_y = \sum_{i=1}^{8} PE_{i,y}, \quad (1)$$

where:

PE_y – emissions per year in the project scenario, tones of $CO_{2\,e}$;
i – type of production;
$PE_{i,y}$ – emissions per year in the project scenario corresponding type of production, tones of $CO_{2\,e}$;
i=1 – Ethylene Stage I;
i=2 – Ethylene Stage II;
i=3 – Ethylene Stage III;
i=4 – Ethylene Stage IV;
i=5 – production of HDPE;
i=6 – production of LDPE Stage II;
i=7 – production of LDPE Stage III;
i=8 – production of phenol.

For calculating emissions in the project scenario used the formulas given in the approved consolidated methodology ACM0012 "Consolidated baseline methodology for GHG emission reductions from waste energy recovery projects" (Version 3.2).

$$PE_{i,y} = PE_{elec,i,y} + PE_{term,i,y}, \quad (1.1)$$

where:
$PE_{elec,i,y}$ – emissions in the project scenario, which are due to electricity consumption for the production of i-product, t $CO_{2\,e}$;
$PE_{term,i,y}$ – emissions in the project scenario, which are caused by the consumption of thermal energy for the i-th type of product, t $CO_{2\,e}$

$PE_{elec,i,y} = EC_i \cdot EF_{co2,elec}$, (1.1.1)

where:
EC_i – amount of electrical energy that is consumed for the production of i-product, MW•h;
$EF_{co2,elec}$ – emission factor for the energy system of the Russian Federation, t $CO_{2\,e}$ / MW•h.

$PE_{term,i,y} = HC_i \cdot 4{,}1868 \cdot EF_{co2,NG}/\eta$, (1.1.2)

where:
HC_i – amount of heat energy that is consumed for the production of i-type products, wove;
$EF_{co2,NG}$ – emission factor for natural gas combustion, t $CO_{2\,e}$ /TJ;
η – efficiency (efficiency) of the energy company that provides thermal energy production;
4,1868– standardized coefficient for the transfer of Tcal TJ, TJ/Tcal.

$EF_{co2,NG} = OXID_{NG} \cdot W_{NG} \cdot 44/12$, (1.1.2.1)

where:
$OXID_{NG}$ – fraction of unoxidized carbon natural gas;
W_{NG} – The carbon content in natural gas, t C / TJ;
44/12 – stoichiometric ratio between the molecular weight of carbon dioxide and carbon t $CO_{2\,e}$ / t C.

D.1.1.3. Relevant data necessary for determining the baseline of anthropogenic emissions of greenhouse gases by sources within the project boundary, and how such data will be collected and archived:								
ID number *(Please use numbers to ease cross-referencing to D.2.)*	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
1	2	3	4	5	6	7	8	9
1. $EF_{co2,elec}$	emission factor for the energy system of the Russian Federation	"Operational Guidelines for Project Design Documents of Joint Implementation Projects. Volume 1: General guidelines. Version 2.3. Ministry of Economic Affairs of the Netherlands." 2004	t $CO_{2\,e}$ /MW•h	e	annually	1	electronically and on paper	data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
2. P_i	Amount of output production the i-form	means of measuring the specific product	t	m	monthly	1	electronically and on paper	The same
3. $SEC_{i,elec}$	specific consumption of electrical energy to produce the i-form	a fixed value based on historical data of production the i-form	MW•h /t	c	fixed bath data	1	electronically and on paper	The same

1	2	3	4	5	6	7	8	9
4. $SEC_{i,term}$	specific consumption of thermal energy to produce the i-form	a fixed value based on historical data of production the i-form	Tkal/t	c	fixed data	1	electronically and on paper	The same
5. $OXID_{NG}$	fraction of unoxidized carbon natural gas	"The National inventory report"	%	e	annually	1	electronically and on paper	The same
6. W_{NG}	The carbon content in natural gas	"The National inventory report"	t C/TJ	e	annually	1	electronically and on paper	The same
7. η	efficiency (efficiency) of the energy company that provides thermal energy production	"Tool to determine the baseline efficiency of thermal or electric energy generation systems" (Version 01)	%	e	annually	1	electronically and on paper	The same

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

Emissions in the baseline scenario are calculated as follows:

$$BE_y = \sum_{i=1}^{8} BE_{i,y}, \quad (2)$$

where:
PE_y – emissions per year in the project scenario, tones of $CO_{2\,e}$;
i – type of production;
$PE_{i,y}$ – emissions per year in the project scenario corresponding type of production, tones of $CO_{2\,e}$;
i=1 – Ethylene Stage I;
i=2 – Ethylene Stage II;
i=3 – Ethylene Stage III;
i=4 – Ethylene Stage IV;
i=5 – production of HDPE;
i=6 – production of LDPE Stage II;
i=7 – production of LDPE Stage III;
i=8 – production of phenol.

For calculating emissions in the baseline scenario used in the formulas given in the approved consolidated methodology ACM0012 "Consolidated baseline methodology for GHG emission reductions from waste energy recovery projects" (Version 3.2).

$$BE_{i,y} = BE_{elec,i,y} + BE_{term,i,y}, \quad (2.1)$$

where:
$BE_{elec,i,y}$ – emissions in the baseline scenario, which are due to electricity consumption for the production of i-product, t $CO_{2\,e}$;
$BE_{term,i,y}$ – emissions in the baseline scenario, which are caused by the consumption of thermal energy for the i-th type of product, t $CO_{2\,e}$.

$BE_{elec,i,y} = EC_i \cdot EF_{co2,elec}$, (2.1.1)

where:
EC_i – amount of electrical energy that is consumed for the production of i-product, MW•h;
$EF_{co2,elec}$ – emission factor for the energy system of the Russian Federation, t $CO_{2\,e}$ /MW•h.
$EC_i = P_i \cdot SEC_{i,elec}$, (2.1.1.1)

where:
Pi - the amount of output production of i-type, T;
SEC_i, elec - specific consumption of electrical energy for the i-form, MW•h / t.$BE_{term,i,y} = HC_i \cdot EF_{co2,NG}/\eta$, (2.1.2)

where:
HC_i - amount of heat energy that is consumed for the production of i-product, TJ;
$EF_{co2,\,NG}$ - emission factor for natural gas combustion, t $CO_{2\,e}$ / TJ;
η - efficiency (efficiency) of the energy company that provides thermal energy production.
$HC_i = P_i \cdot SEC_{i,term} \cdot 4{,}1868$, (2.1.2.1)

where:
Pi - the amount of output production of i-type, T;
SEC_i, term - the specific consumption of thermal energy for the i-form, Tcal / t;
4,1868 - standardized coefficient for the transfer of Tcal TJ, TJ /Tcal.
$EF_{co2,NG} = OXID_{NG} \cdot W_{NG} \cdot 44/12$, (2.1.2.2)

where:
$OXID_{NG}$ - the proportion of unoxidized carbon natural gas;
W_{NG} - carbon content in natural gas, t C/TJ;
44/12 - stoichiometric ratio between the molecular weight of carbon dioxide and carbon, t $CO_{2\,e}$ /t C.

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

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

For this project does not apply.

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):

For this project does not apply.

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

For this project does not apply. Leakage is not expected, because the project activity is the reduction of energy consumption, which is used in the baseline. During the project implementation is expected to reduce consumption of natural gas, and as a consequence of leakage of natural gas from the gas transportation system of the Russian Federation. In accordance with the requirements of the "Guidance on criteria for baseline setting and monitoring" (Version 02) for this project used a conservative approach in which to calculate the emissions of the project is not considered leakage reduction.

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

For this project does not apply.

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

The annual emission reduction is calculated as follows:

$$ER_y = BE_y – PE_y, \quad (3)$$

where:
ER_y - annual reductions from the project activity, t $CO_{2\,e}$;
PE_y - annual emissions in the project scenario, t $CO_{2\,e}$;
BE_y - annual emissions in the baseline scenario, t $CO_{2\,e}$.

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:

This project will reduce the consumption of energy (heat and electricity) on the production of OJSC "Kazanorgsintez". Reducing energy consumption in the production process would reduce emissions of greenhouse gases into the environment. Thus, the overall impact on the environment is positive. In the framework of procedures performed in accordance with the requirements of the relevant public services, the company periodically reports on environmental indicators.

The company's activities carried out in accordance with the environmental legislation of the Russian Federation and the Republic of Tatarstan. Every year, developed and implemented environmental action plans aimed at reducing the harmful effects of the objects of exploitation on the environment, the rational use of water resources and protection of water bodies. Analytical control for different kinds of environmental impacts resulting from the production is carried out in accordance with applicable Russian legislation, including the Federal Law of the Russian Federation "On environmental protection" from 10.01.2002 № 7-FZ Federal Law of the Russian Federation "On environmental Expertise"[1], 1 from 23.11.1995 № 174-FZ.

Office of Technical and Environmental Control of the Federal Service for Environmental, Technological and Nuclear Supervision of the Republic of Tatarstan, after appropriate verifications had issued OJSC "Kazanorgsintez" permit on the emission of harmful substances (pollutants) into the air from the number №B.07.442.07.61 from 28.12.2007.

Since 2005, the company operates an environmental management system certified to international standard ISO 14001. Management system can improve the efficiency of processes and actions aimed at achieving continuous improvement in environmental protection. The current system of environmental monitoring can accurately and objectively monitor the environmental situation in the zone of influence of the enterprise, to analyze the trend of atmospheric air and water, to determine the effectiveness of the environmental protection measures, to quickly identify and address emerging environmental non-standard situations at work sites. Before OJSC "Kazanorgsintez" task is a prudent and rational utilization of natural resources to ensure the subsistence needs of people in conjunction with the protection and reproduction of the natural environment. Solution to this problem is possible only from a position of a systematic approach that realizes the complexity of action in all spheres of production. Indicator of understanding the responsibilities assigned to the task now is the Company's activities in the field of environmental protection, for which OJSC "Kazanorgsintez" repeatedly awarded with diplomas and certificates. These include: diplomas Environmental Forum "Man. Nature. Science. Technique" for outstanding work in the field of environmental protection; Annual degrees ECO leader winner in nomination "For an effective environmental program."

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[1] http://duma.consultant.ru/page.aspx?8550;1165656

Sanitary and industrial laboratory OJSC "Kazanorgsintez" having a certificate of accreditation from 27.03.2008 № ROSS 0001.512321, oversees:
- content of harmful substances (dust, gases, and vapors) in the working area;
- the efficiency of dust trapping gas installations and for compliance with established standards for maximum permissible emissions into the atmosphere;

- the air quality in the plant and the sanitary-protective zone (fixed site), including control under adverse weather conditions (AWC);
- distribution of emissions around the joint stock company (under the flare selection);
- the work of local facilities for treatment of industrial wastewater to meet standards of technical regulations;
- the quality of chemical and contaminated industrial storm water production company;
- the quality of wastewater after biological treatment facilities before being discharged into the reservoir;
- the quality of the water reservoir of the Volga River, above, below and in the place of registration of treated waste water;
- the quality of wash water (control wing) shop treatment facilities and external communications;
- the quality of groundwater in the area of the sanatorium "Krutushka";
- air pollution at the request of shops, services, during the fire and gas hazardous work (welding, equipment repair, etc.);
- the parameters of physical factors in the production facilities (noise, lighting, climate, vibration, electromagnetic fields).

D.2. Quality control (QC) and quality assurance (QA) procedures undertaken for data monitored:		
Data *(Indicate table and ID number)*	Uncertainty level of data (high/medium/low)	Explain QA/QC procedures planned for these data, or why such procedures are not necessary.
1	2	3
EC_i (D.1.1.1 – 1)	Low	Amount of electrical energy that is consumed for the production of i-product, is measured by the company with the help of electricity meters. Electricity meters, with the help of which the following measure the amount of electric energy are subject to periodic verification or calibration
$EF_{co2,elec}$ (D.1.1.1 – 2, D.1.1.3 – 1)	Low	Emission factor for the energy system of the Russian Federation is standardized. Studies were conducted to determine this parameter have been detailed in the "Operational Guidelines for Project Design Documents of Joint Implementation Projects. Volume 1: General guidelines. Version 2.3. Ministry of Economic Affairs of the Netherlands." 2004. This document is subject to periodic review and amendment to it, when necessary, appropriate corrective data

1	2	3
HCi (D.1.1.1 – 3)	Low	Amount of heat energy that is consumed for the production of i-product, defined at the enterprise through measurement using metering of heat energy. All measurement tools that are included in the accounting unit are subject to periodic verification or calibration
η (D.1.1.1 – 4, D.1.1.3 – 7)	Low	Energy efficiency (efficiency) of the energy company that provides thermal energy production is fixed and is determined by the "Consolidated baseline methodology for GHG emission reductions from waste energy recovery projects" (Version 01). This document is subject to periodic review and amendment to it, when necessary, appropriate corrective data
$OXID_{NG}$ (D.1.1.1 – 5, D.1.1.3 – 5)	Low	Proportion of unoxidized carbon natural gas is determined in accordance with the data of the "National inventory report". This document is subject to periodic review and amendment to it, when necessary, appropriate corrective data
W_{NG} (D.1.1.1 – 6, D.1.1.3 – 6)	Low	The carbon content in natural gas is determined in accordance with the data of the "National inventory report". This document is subject to periodic review and amendment to it, when necessary, appropriate corrective data
Pi (D.1.1.3 – 2)	Low	The amount of the products manufactured by the i-form defined by the enterprise through measurement by means of measurement of the actual product. All measurement tools that are included in the accounting unit are subject to periodic verification or calibration
$SEC_{i,elec}$ (D.1.1.1 – 3)	Low	Specific consumption of electrical energy for the i-type has a fixed value and is determined based on historical data of production of i-type 3 years prior to the start of the project activity
$SEC_{i,term}$ (D.1.1.1 – 4)	Low	Specific consumption of heat energy for the i-type has a fixed value and is determined based on historical data of production of i-type 3 years prior to the start of the project activity

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

Monitoring data in the previous section is a part of the overall operation of the project to implement a set of energy saving measures at the OJSC "Kazanorgsintez".

Monitoring data that is to be measured, technological personnel of the company disclaims metering specific energy and makes the appropriate entries in technological journals.Technological personnel of the company performs all measurements in accordance with the requirements of the Federal Law "On ensuring the unity of measurements"[1] from 26.06.2008 № 102-FZ. Consolidated data on the consumption of energy per month appear in the monthly report. Also check the data on output and consumption of energy is recorded using the SAPR / 3. Monitoring data that is to be measured, stored electronically and on paper.

A simplified scheme of the measurement of electrical and thermal energy is shown in Figures 4 and 5, respectively.

[1] http://duma.consultant.ru/page.aspx?8550;965641

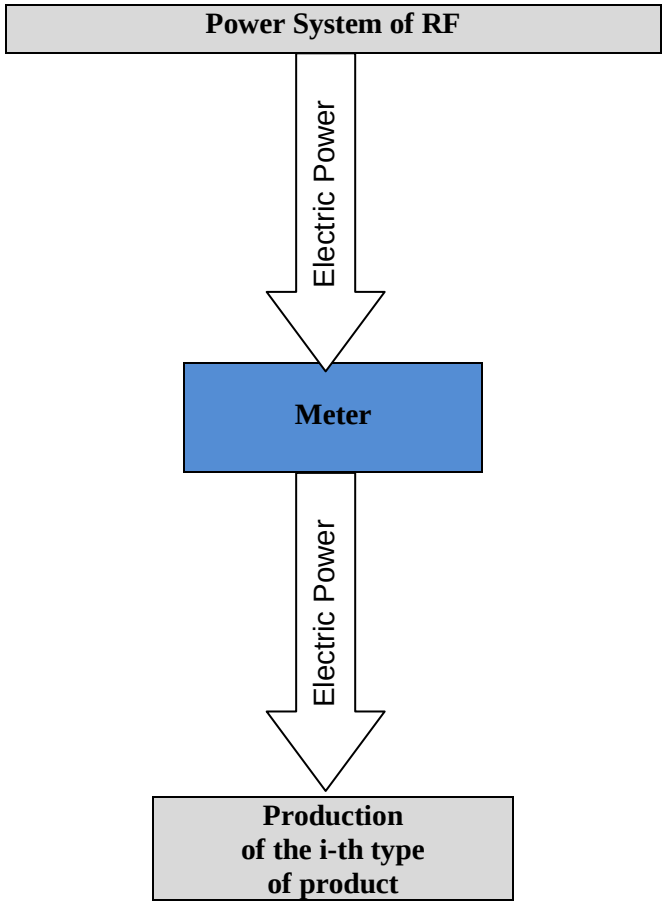

Figure 4 - Simplified measurement of electricity

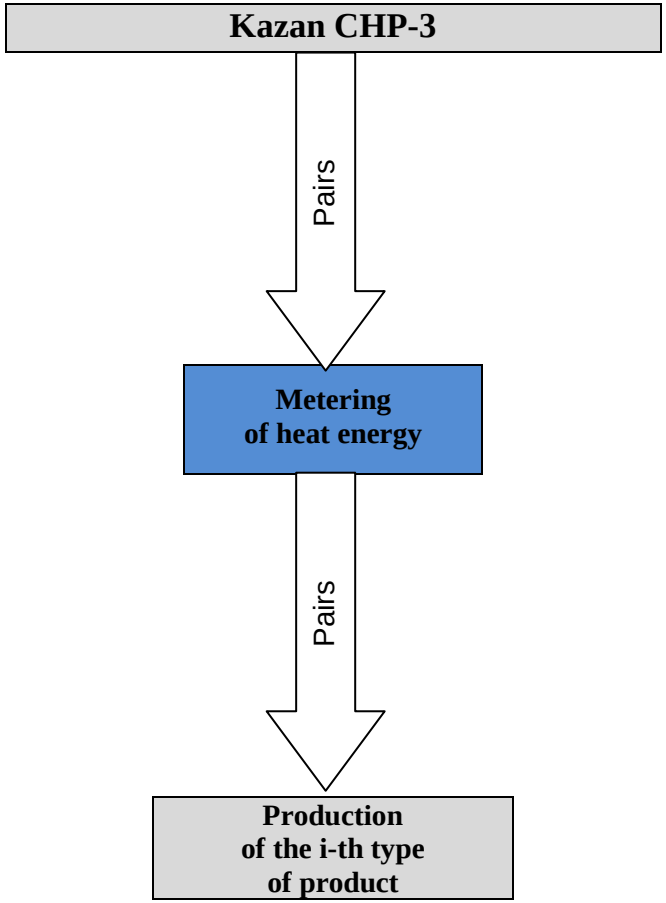

Figure 5 - A simplified scheme for measuring the thermal energy

General Director of OJSC"Kazanorgsintez" appoint the staff of the company, whose responsibilities include operation and maintenance of technological equipment, which is involved in the project. Those functions include, inter alia, the registration of all data needed for monitoring. Monitoring group headed by Deputy Director General for Research and Development OJSC "Kazanorgsintez". Monitoring is carried out in close contact with the process staff and includes direct monitoring, and analysis and archiving of all data specified in the previous section. The organization works on the calculation of emission reduction units as part of the responsibilities of the monitoring group. The calculation of emission reductions on behalf of the head of the monitoring group can carry out the project developer for joint implementation. Periodic data on energy consumption are analyzed with respect to the relevant registered parameters derived from technological personnel to confirm their authenticity. In case of discrepancies in the data, the monitoring group in interaction with technological personnel should clarify the origin of the discrepancies. If inconsistencies monitoring data in the system for monitoring the rate necessary to make appropriate adjustments.

All information regarding the monitoring data and corrective actions to be archived for subsequent verification of emission reduction units. The head of the monitoring group is responsible for preparing monitoring reports and archiving. The Director-General periodically review the monitoring data and related documentation. If necessary, assistance in monitoring the project developer may provide for joint implementation.

The management structure monitoring is shown in Figure 6.

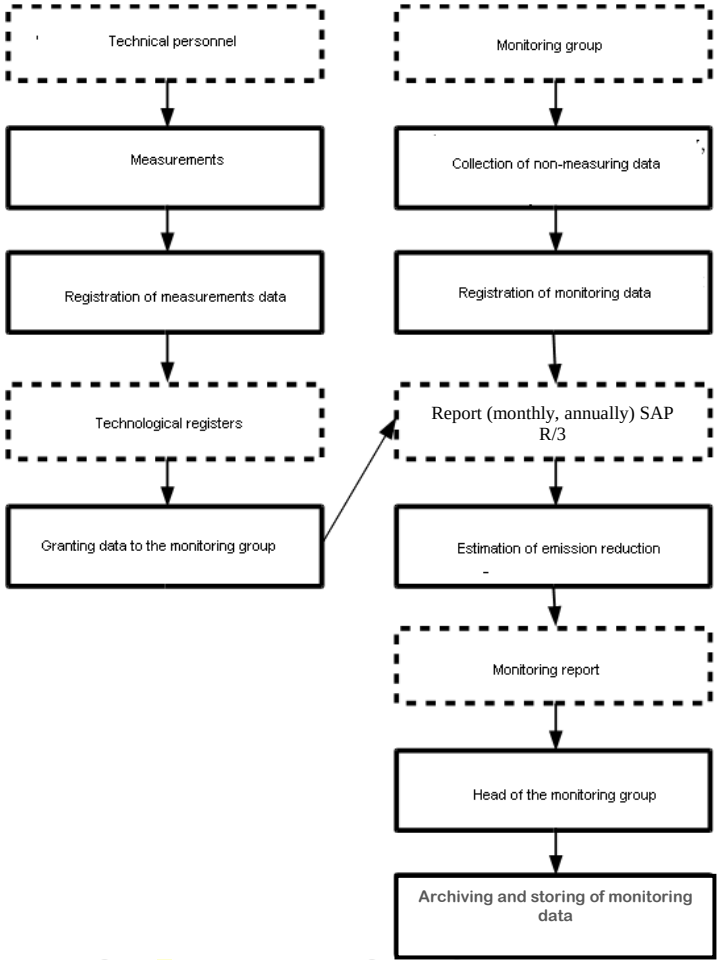

Figure 6 - The management structure monitoring

Measurement and archiving of measurement results is the responsibility of manufacturing personnel. The results of measurements of technological personnel transfer monitoring team for the organization works on the calculation of emission reductions of greenhouse gases. The calculation of emission reductions on behalf of the head of the monitoring group can carry out the project developer for joint implementation. The responsibility of the monitoring group also includes the collection of data that can not be measured, but are subject to monitoring. The monitoring group is obliged to make a backup of monitoring data; store the backup data should be separate from the underlying data to eliminate the likelihood of their losses in the event of force majeure due to which may be lost key monitoring data.

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

Individuals who have established a monitoring plan:

Name of organization:	"SIC GLOBAL LLP" - a project participant
Address:	Great James street, 23-24
City:	London
Country:	United Kingdom
Contact:	Kolyesnikov Viktor Viktorovitch
Position:	SIC representative
Phone:	+380 68 1292233
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E-mail:	vicv@bigmir.net

SECTION E. Estimation of greenhouse gas emission reductions

E.1. Estimated project emissions:

Emissions in the project scenario are calculated in accordance with the formulas given in D.1.1.2.

Year	Project scenario emissions, which are caused by the consumption of electricity, (t $CO_{2\,e}$)	Project scenario emissions, which are caused by the heat consumption, (t $CO_{2\,e}$)	Estimated project emissions (t $CO_{2\,e}$)
2008	512 519	298 428	810 947
2009	513 871	286 666	800 537
2010	459 308	271 994	731 302
2011	567 944	334 285	902 229
2012	561 004	334 423	895 427

E.2. Estimated leakage:

For this project does not apply

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

Sum of the exponents E1. and E2. corresponds E.1.

E.4. Estimated baseline emissions:

Emissions in the baseline scenario are calculated in accordance with the formulas given in D.1.1.4.

Year	Calculated project emissions (t $CO_{2\,e}$)	Baseline scenario emissions, which are caused by the heat consumption, (t $CO_{2\,e}$)	Estimated baseline emissions (t $CO_{2\,e}$)
2008	638 948	429 814	1 068 762
2009	643 093	428 373	1 071 466
2010	588 947	427 194	1 016 141
2011	737 369	514 152	1 251 521
2012	728 436	515 144	1 243 580

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

Year	Emission reductions, which are caused by the consumption of electricity, (t $CO_{2\,e}$)	Emission reductions, which are caused by the heat consumption, (t $CO_{2\,e}$)	Estimated emission reductions (t $CO_{2\,e}$)
2008	126 429	131 386	257 815
2009	129 222	141 707	270 929
2010	129 639	155 200	284 839
2011	169 425	179 867	349 292
2012	167 432	180 721	348 153

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

Year	Estimated project emissions (t $CO_{2\,e}$)	Estimated leakage (t $CO_{2\,e}$)	Estimated baseline emissions (t $CO_{2\,e}$)	Estimated emissions reductions (t $CO_{2\,e}$)
2008	810 947	0	1 068 762	257 815
2009	800 537	0	1 071 466	270 929
2010	731 302	0	1 016 141	284 839
2011	902 229	0	1 251 521	349 292
2012	895 427	0	1 243 580	348 153
Total (t of $CO_{2\,e}$)	4 140 442	0	5 651 470	1 511 028

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:

Suggested activities to modernize the production of OJSC "Kazanorgsintez" will have a positive impact on the environment by reducing consumption of energy resources to produce products that will reduce emissions of greenhouse gases into the environment.

Production of OJSC "Kazanorgsintez" is a very energy intensive. Greenhouse gas emissions occur as a result of burning natural gas to produce heat and electricity for industrial needs of the enterprise. Emission reductions will occur through the implementation of measures for modernization of production planned the project. Measures on modernization of production will reduce the flaring of natural gas for heat and electricity power plants of the Russian Federation. The proposed project will reduce the specific consumption of heat and electrical energy per tone of production. Reduction of specific consumption of heat and electricity for production will reduce the flaring of natural gas power plants of the Russian Federation for the production of heat and electricity. Reduction of flaring of natural gas would reduce emissions of greenhouse gases in the atmosphere, which occur as a result of burning fossil fuels.

Analytical control over different kinds of environmental impacts resulting from the manufacturing is carried out in accordance with existing Russian legislation, including the Federal Law of the Russian Federation "On environmental protection" from 10.01.2002 № 7-FZ Federal Law of the Russian Federation "On environmental Expertise "from 23.11.1995 № 174-FZ.

During the implementation of the present joint implementation project the evaluation of the environmental impact was carried out. Complete information toward this assessment is described in the general explanatory note on "Environmental Impact Assessment (EIA) of the OJSC "Kazanorgsintez" with regard to the existing, renovated and newly productions"[1].

Governance of Technical and Environmental Control of the Federal Service for Ecological, Technological and Nuclear Supervision Service of the Republic of Tatarstan, after appropriate checks issued to the OJSC "Kazanorgsintez" permit on the emission of harmful substances (pollutants) into the air # V.07.442.07.61 from 28.12.2007.

[1] 06078-1-EIA-30-03959 General explanatory note "Environmental Impact Assessment (EIA) of the OJSC "Kazanorgsintez" with regard to the existing, renovated and newly productions"

In accordance with the Russian Federation Federal Law "On ecological expertise" from 23.11.1995 # 174-FZ number of activities under the present project was a subject of state examination. In particular OJSC "Kazanorgsintez" received the following positive conclusions of expertise:

- modernization of ethylene productions (approved by the state examination #0133-09/KGE-0417/04);

- modernization of HDP production (the conclusion of Industrial safety expertise registration number #1-114/06);

- modernization of LDPE production (the conclusion of Industrial safety expertise registration number #43-PD-018542-2007);

- modernization of phenol production (approved by the state examination №0065-10/KGE-0708/04).

Emission reductions to be achieved as a result of the project of joint implementation, has an impact on the environment of the Russian Federation and has no effect on greenhouse gas outside of Russia.

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:

During the implementation of the joint implementation project was carried out assessment of the impact on the environment. The assessment of the environmental impact of existing, renovated and newly productions of OJSC "Kazanorgsintez" showed that:

- subject to the technological regime of work objects OJSC "Kazanorgsintez" and all the environmental activities under the project, substantial and irreversible harm to the environment will not be applied;

-air pollution of all productions with the proposed measures to reduce fugitive emissions at the boundary of the SPZ = 1000 m and a residential area in normal and multiple modes of operation does not exceed PDK_{mr} on any of the discharged substances and groups of summation;

- the proposed measures will reduce emissions by 4318 tons per year;

- the recommended system is an integrated environmental monitoring allows you to monitor, predict and resolving all negative technological consequences arising during operation of OJSC "Kazanorgsintez";

- adverse impact of existing and planned facilities on surface and underground water, mineral resources, soil, flora, fauna and humans are insignificant and will not lead to a breach of natural and man-made balance;

- continuing Education nonutilizable solid waste not, nonutilizable solid waste periodically removed to places of burial, or destroyed, the waste disposed of at the plant;

- the application of water circulation systems uses maximum savings for industrial use water from natural sources;

- subject to implementation of the proposed activities for the whole company could be saved consumption of the order of 40000 m^3/day of fresh water, which compensates for the lack of performance intakes, arising from the renovation and construction of new facilities;

- reduce the amount of wastewater from blow down water circulation systems, operates on the sewage treatment plants, about 24000 m^3/day, which also compensates for the lack of capacity of existing sewage treatment plants.

Conclusion.

Based on the foregoing, we conclude that the implementation of the planned economic activity will have no negative impact on living conditions, work and health of both staff and a amount of living of the population and does not lead to deterioration of the demographic and epidemiological conditions.

SECTION G. Stakeholders' comments

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

The receiving party does not require for the joint implementation projects in consultation with stakeholders.

Stakeholder comments will be collected at the time of publication of this project as part of the determination.

Annex 1

CONTACT INFORMATION ON PROJECT PARTICIPANTS

Organisation:	OJSC "Kazanorgsintez"
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Fax:	+7 843 533 98 09
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URL:	www.kazanorgsintez.ru
Represented by:	
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Salutation:	mister
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Middle name:	Hydyatovych
First name:	Lenar
Department:	Technical
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Phone:	+37257775666
Fax:	-
E-mail:	sic@ipnet.ua
URL:	
Represented by:	Kolyesnikov V.V.
Title:	SIC representative
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Last name:	Kolyesnikov
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Personal e-mail:	vicv@bigmir.net

Annex 2

BASELINE INFORMATION

For this project, the baseline scenario was chosen in accordance with the "Guidance on criteria for baseline setting and monitoring" (Version 02). In accordance with the requirements of this document to select the baseline scenario was chosen as a certain approach, which applies only to a specific project for joint implementation. Description and justification of the selected baseline scenario described in section B.1 of this document.

For the base case scenario was adopted by the current situation in the enterprise, without executing modernization activities under the project of joint implementation.

Greenhouse gas emissions in the baseline scenario of this project are formed due to the consumption of electricity and heat in the production process OJSC "Kazanorgsintez", namely: greenhouse gas emissions produced by burning fossil fuels in thermal and electrical energy. Source of emissions of this project are the production capacities of OJSC "Kazanorgsintez" indirect source of emissions is from Kazan CHP-3, which provides heat and electricity company OJSC "Kazanorgsintez".

In accordance with the selected baseline scenario emissions are calculated according to formulas specified in section D.1.1.4 this document.

Annex 3

MONITORING PLAN

For this project, a joint implementation plan for monitoring was selected in accordance with the "Guidance on criteria for baseline setting and monitoring" (Version 02), the choice of the monitoring plan was based on a particular approach, which applies only to a specific project for joint implementation.

The monitoring plan is defined in Section D of this document.

Data (parameters) that should be monitored are presented in tables below.

<table>
<tr><td>Data/Parameter</td><td>EC_1</td></tr>
<tr><td>Data unit</td><td>MW•h</td></tr>
<tr><td>Description</td><td>Amount of electrical energy that is consumed for the production of ethylene Stage I</td></tr>
<tr><td>Time
determine/control</td><td>Monthly. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs</td></tr>
<tr><td>Source data used</td><td>Measurement</td></tr>
<tr><td>Data value
(for the expected settlement/definitions)</td><td>Expected amount of consumed electric energy, calculated on the basis of projected data of ethylene production Stage I
<table>
<tr><td>Year</td><td>MW•h</td></tr>
<tr><td>2008</td><td>63 648,721</td></tr>
<tr><td>2009</td><td>61 158,505</td></tr>
<tr><td>2010</td><td>61 327,621</td></tr>
<tr><td>2011</td><td>62 300,000</td></tr>
<tr><td>2012</td><td>62 300,000</td></tr>
</table></td></tr>
<tr><td>Justification of the choice of data or description of measurement methods and procedures that apply</td><td>Measuring the amount of electrical energy by the relevant counters of electric power</td></tr>
<tr><td>Procedures for QA/QC,
which are used</td><td>Measurement tools that are used when performing the measurements, subject to periodic verification or calibration</td></tr>
<tr><td>Comments</td><td>-</td></tr>
</table>

Data/Parameter	EC_2
Data unit	MW•h
Description	Amount of electrical energy that is consumed for the production of ethylene Stage II
Time determine/control	Monthly. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs

Source data used	Measurement
Data value (for the expected settlement/definitions)	Expected amount of consumed electric energy, calculated on the basis of projected data of ethylene production Stage II

Year	MW•h
2008	102 479,733
2009	84 181,304
2010	49 161,301
2011	86 438,000
2012	86 438,000

Justification of the choice of data or description of measurement methods and procedures that apply	Measuring the amount of electrical energy by the relevant counters of electric power
Procedures for QA/QC, which are used	Measurement tools that are used when performing the measurements, subject to periodic verification or calibration
Comments	-

Data/Parameter	EC_3
Unit	MW•h
Description	Amount of electrical energy that is consumed for the production of ethylene Stage III
Time determine/control	Monthly. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source data used	Measurement
Data value (for the expected settlement/definitions)	Expected amount of consumed electric energy, calculated on the basis of projected data of ethylene production Stage III

Year	MW•h
2008	158 710,486
2009	162 637,973
2010	119 769,241
2011	170 127,000
2012	170 127,000

Justification of the choice of data or description of measurement methods and procedures that apply	Measuring the amount of electrical energy by the relevant counters of electric power
Procedures for QA/QC, which are used	Measurement tools that are used when performing the measurements, subject to periodic verification or calibration
Comments	-

Data/Parameter	EC_4
Data unit	MW•h
Description	Amount of electrical energy that is consumed for the production of ethylene Stage IV
Time determine/control	Monthly. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source data used	Measurement
Data value	Expected amount of consumed electric energy, calculated on the

(for the expected settlement/definitions)	basis of projected data of ethylene production Stage IV Year | MW•h 2008 | 260 961,463 2009 | 261 580,666 2010 | 257 599,071 2011 | 332 800,000 2012 | 332 800,000
Justification of the choice of data or description of measurement methods and procedures that apply	Measuring the amount of electrical energy by the relevant counters of electric power
Procedures for QA/QC, which are used	Measurement tools that are used when performing the measurements, subject to periodic verification or calibration
Comments	-

Data/Parameter	EC_5
Data unit	MW•h
Description	Amount of electrical energy that is consumed for the production of HDPE
Time determine/control	Monthly. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source data used	Measurement
Data value (for the expected settlement/definitions)	Expected amount of consumed electric energy, calculated on the basis of projected HDPE production data Year | MW•h 2008 | 131 671,641 2009 | 155 158,995 2010 | 157 697,342 2011 | 184 564,000 2012 | 187 269,000
Justification of the choice of data or description of measurement methods and procedures that apply	Measuring the amount of electrical energy by the relevant counters of electric power
Procedures for QA/QC, which are used	Measurement tools that are used when performing the measurements, subject to periodic verification or calibration
Comments	-

Data/Parameter	EC_6
Data unit	MW·h
Description	Amount of electrical energy that is consumed for the production of LDPE Stage II
Time determine/control	Monthly. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source data used	Measurement
Data value (for the expected settlement/definitions)	Expected amount of consumed electric energy, calculated on the basis of projected production data LDPE Stage II Year | MW·h

		2008	72 467,806
		2009	68 005,518
		2010	64 666,992
		2011	75 306,000
		2012	75 306,000
Justification of the choice of data or description of measurement methods and procedures that apply	Measuring the amount of electrical energy by the relevant counters of electric power		
Procedures for QA/QC, which are used	Measurement tools that are used when performing the measurements, subject to periodic verification or calibration		
Comments	-		

Data/Parameter	EC_7		
Data unit	MW·h		
Description	Amount of electrical energy that is consumed for the production of LDPE Stage III		
Time determine/control	Monthly. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs		
Source data used	Measurement		
Data value (for the expected settlement/definitions)	Expected amount of consumed electric energy, calculated on the basis of projected production data LDPE Stage III		
		Year	MW·h
		2008	113 969,019
		2009	126 710,593
		2010	120 685,649
		2011	130 480,000
		2012	130 480,000
Justification of the choice of data or description of measurement methods and procedures that apply	Measuring the amount of electrical energy by the relevant counters of electric power		
Procedures for QA/QC, which are used	Measurement tools that are used when performing the measurements, subject to periodic verification or calibration		
Comments	-		

Data/Parameter	EC_8		
Data unit	MW·h		
Description	Amount of electrical energy that is consumed for the production of phenol		
Time determine/control	Monthly. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs		
Source data used	Measurement		
Data value (for the expected settlement/definitions)	Expected amount of consumed electric energy, calculated on the basis of projected production data of phenol		
		Year	MW·h
		2008	3 207,630

		2009	3 137,320
		2010	4 198,934
		2011	5 850,000
		2012	5 850,000
Justification of the choice of data or description of measurement methods and procedures that apply	Measuring the amount of electrical energy by the relevant counters of electric power		
Procedures for QA/QC, which are used	Measurement tools that are used when performing the measurements, subject to periodic verification or calibration		
Comments	-		

Data/Parameter	$EF_{co2,elec}$		
Data unit	t $CO_{2\ e}$/MW·h		
Description	Emission factor for the energy system of the Russian Federation		
Time determine/control	Annualy. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs		
Source data used	"Operational Guidelines for Project Design Documents of Joint Implementation Projects. Volume 1: General guidelines. Version 2.3. Ministry of Economic Affairs of the Netherlands." 2004		
Data value (for the expected settlement/definitions)		Year	t $CO_{2\ e}$/MW·h
		2008	0,5 5
		2009	0,557
		2010	0,550
		2011	0,542
		2012	0,534
Justification of the choice of data or description of measurement methods and procedures that apply	Emission factor for the energy system of the Russian Federation was determined by tender ERUPT Ministry of Economic Affairs of the Netherlands.		
Procedures for QA/QC, which are used	"Operational Guidelines for Project Design Documents of Joint Implementation Projects. Volume 1: General guidelines." subject to periodic review and amendment to it, if necessary, corrective data		
Comments	-		

Data/Parameter	HC_1
Data unit	Gcal
Description	Amount of heat energy that is consumed for the production of ethylene Stage I
Time determine/control	Monthly. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source data used	Measurement
Data value (for the expected settlement/definitions)	Expected amount of consumed heat energy, calculated on the basis of projected data of ethylene production Stage I

Year	Gcal
2008	130 896,333
2009	126 266,721
2010	121 102,184
2011	121 380,000
2012	121 380,000

Justification of the choice of data or description of measurement methods and procedures that apply	Measuring the amount of heat energy is carried out by appropriate means of measurement, which are part of the metering of heat energy
Procedures for QA/QC, which are used	Measurement tools that are used when performing the measurements, subject to periodic verification or calibration
Comments	-

Data/Parameter	HC_2
Data unit	Gcal
Description	Amount of heat energy that is consumed for the production of ethylene Stage II
Time determine/control	Monthly. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source data used	Measurement
Data value (for the expected settlement/definitions)	Expected amount of consumed heat energy, calculated on the basis of projected data of ethylene production Stage II

Year	Gcal
2008	112 031,500
2009	93 866,000
2010	56 585,476
2011	99 857,000
2012	99 857,000

Justification of the choice of data or description of measurement methods and procedures that apply	Measuring the amount of heat energy is carried out by appropriate means of measurement, which are part of the metering of heat energy
Procedures for QA/QC, which are used	Measurement tools that are used when performing the measurements, subject to periodic verification or calibration
Comments	-

Data/Parameter	HC_3
Data unit	Gcal
Description	Amount of heat energy that is consumed for the production of ethylene Stage III
Time determine/control	Monthly. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source data used	Measurement
Data value (for the expected settlement/definitions)	Expected amount of consumed heat energy, calculated on the basis of projected data of ethylene production Stage III

Year	Gcal
2008	138 705,000
2009	172 642,000
2010	127 209,900
2011	190 512,000
2012	190 512,000

Justification of the choice of data or description of measurement methods and procedures that apply	Measuring the amount of heat energy is carried out by appropriate means of measurement, which are part of the metering of heat energy
Procedures for QA/QC, which are used	Measurement tools that are used when performing the measurements, subject to periodic verification or calibration
Comments	-

Data/Parameter	HC_4
Data unit	Gcal
Description	Amount of heat energy that is consumed for the production of ethylene Stage IV
Time determine/control	Monthly. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source data used	Measurement
Data value (for the expected settlement/definitions)	Expected amount of consumed heat energy, calculated on the basis of projected data of ethylene production Stage IV

Year	Gcal
2008	278 172,484
2009	269 429,726
2010	260 441,870
2011	364 414,000
2012	364 414,000

Justification of the choice of data or description of measurement methods and procedures that apply	Measuring the amount of heat energy is carried out by appropriate means of measurement, which are part of the metering of heat energy
Procedures for QA/QC, which are used	Measurement tools that are used when performing the measurements, subject to periodic verification or calibration
Comments	-

Data/Parameter	HC_5
Data unit	Gcal

Description	Amount of heat energy that is consumed for the production of HDPE Stage I
Time determine/control	Monthly. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source data used	Measurement
Data value (for the expected settlement/definitions)	Expected amount of consumed heat energy, calculated on the basis of projected production data HDPE Stage I

Year	Gcal
2008	38 185,048
2009	36 462,200
2010	35 696,310
2011	37 380,000
2012	37 928,000

Justification of the choice of data or description of measurement methods and procedures that apply	Measuring the amount of heat energy is carried out by appropriate means of measurement, which are part of the metering of heat energy
Procedures for QA/QC, which are used	Measurement tools that are used when performing the measurements, subject to periodic verification or calibration
Comments	-

Data/Parameter	HC_6
Data unit	Gcal
Description	Amount of heat energy that is consumed for the production of LDPE Stage II
Time determine/control	Monthly. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source data used	Measurement
Data value (for the expected settlement/definitions)	Expected amount of consumed heat energy, calculated on the basis of projected production data HDPE Stage II

Year	Gcal
2008	12 463,240
2009	12 598,900
2010	11 589,405
2011	13 552,000
2012	13 552,000

Justification of the choice of data or description of measurement methods and procedures that apply	Measuring the amount of heat energy is carried out by appropriate means of measurement, which are part of the metering of heat energy
Procedures for QA/QC, which are used	Measurement tools that are used when performing the measurements, subject to periodic verification or calibration
Comments	-

Data/Parameter	HC_7
Data unit	Gcal
Description	Amount of heat energy that is consumed for the production of LDPE Stage III

Time determine/control	Monthly. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source data used	Measurement
Data value (for the expected settlement/definitions)	Expected amount of consumed heat energy, calculated on the basis of projected production data HDPE Stage III

Year	Gcal
2008	54 351,500
2009	54 301,300
2010	52 578,810
2011	55 300,000
2012	55 300,000

Justification of the choice of data or description of measurement methods and procedures that apply	Measuring the amount of heat energy is carried out by appropriate means of measurement, which are part of the metering of heat energy
Procedures for QA/QC, which are used	Measurement tools that are used when performing the measurements, subject to periodic verification or calibration
Comments	-

Data/Parameter	HC_8
Data unit	Gcal
Description	Amount of heat energy that is consumed for the production of phenol
Time determine/control	Monthly. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source data used	Measurement
Data value (for the expected settlement/definitions)	Expected amount of consumed heat energy, calculated on the basis of projected production data of phenol

Year	Gcal
2008	421 614,680
2009	374 089,500
2010	416 120,939
2011	446 570,000
2012	446 570,000

Justification of the choice of data or description of measurement methods and procedures that apply	Measuring the amount of heat energy is carried out by appropriate means of measurement, which are part of the metering of heat energy
Procedures for QA/QC, which are used	Measurement tools that are used when performing the measurements, subject to periodic verification or calibration
Comments	-

Data/Parameter	η
Data unit	%
Description	Energy efficiency (efficiency) of the energy company that provides thermal energy production OJSC "Kazanorgsintez"
Time	Annually. Data should be stored during the crediting period and

determine/control	another for 2 years after the last accrual of ERUs
Source data used	"Tool to determine the baseline efficiency of thermal or electric energy generation systems" (Version 01)
Data value (for the expected settlement/definitions)	92
Justification of the choice of data or description of measurement methods and procedures that apply	This parameter is defined in accordance with the requirements of the "Tool to determine the baseline efficiency of thermal or electric energy generation systems" (Version 01)
Procedures for QA/QC, which are used	"Tool to determine the baseline efficiency of thermal or electric energy generation systems" subject to periodic review and amendment of it, when necessary, appropriate corrective data
Comments	-

Data/Parameter	$OXID_{NG}$
Data unit	%
Description	Proportion of unoxidized carbon natural gas
Time determine/control	Annually. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source data used	"The National inventory report"
Data value (for the expected settlement/definitions)	99,5
Justification of the choice of data or description of measurement methods and procedures that apply	This parameter is defined in accordance with the data of the National inventory report "
Procedures for QA/QC, which are used	"The National inventory report" is subject to periodic review and amendment of it, when necessary, appropriate corrective data
Comments	-

Data/Parameter	W_{NG}
Data unit	t C/TJ
Description	Carbon content in natural gas
Time determine/control	Annually. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source data used	"The National inventory report"

Data value (for the expected settlement/definitions)	15,15
Justification of the choice of data or description of measurement methods and procedures that apply	This parameter is defined in accordance with the data of the National inventory report "
Procedures for QA/QC, which are used	"The National inventory report" is subject to periodic review and amendment of it, when necessary, appropriate corrective data
Comments	-

Data/Parameter	P_1
Data unit	t
Description	Quantity produced ethylene Stage I
Time determine/control	Monthly. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source data used	Measurement
Data value (for the expected settlement/definitions)	Projected production of ethylene Stage I

Year	t
2008	39 167
2009	36 577
2010	33 843
2011	35 000
2012	35 000

Justification of the choice of data or description of measurement methods and procedures that apply	Measuring the amount of ethylene produced by the Stage I by the relevant means of measurement
Procedures for QA/QC, which are used	Measurement tools that are used when performing the measurements, subject to periodic verification or calibration
Comments	-

Data/Parameter	P_2
Data unit	t
Description	Quantity produced ethylene Stage II
Time determine/control	Monthly. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source data used	Measurement
Data value	Projected production of ethylene Stage II

(for the expected settlement/definitions)	Year: t 2008: 52 317 2009: 42 616 2010: 35 322 2011: 60 446 2012: 60 446
Justification of the choice of data or description of measurement methods and procedures that apply	Measuring the amount of ethylene produced by the Stage II by the relevant means of measurement
Procedures for QA/QC, which are used	Measurement tools that are used when performing the measurements, subject to periodic verification or calibration
Comments	-

Data/Parameter	P_3
Data unit	t
Description	Quantity produced ethylene Stage III
Time determine/control	Monthly. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source data used	Measurement
Data value (for the expected settlement/definitions)	Projected production of ethylene Stage III Year: t 2008: 96 684 2009: 105 204 2010: 77 665 2011: 110 840 2012: 110 840
Justification of the choice of data or description of measurement methods and procedures that apply	Measuring the amount of ethylene produced by the Stage III by the relevant means of measurement
Procedures for QA/QC, which are used	Measurement tools that are used when performing the measurements, subject to periodic verification or calibration
Comments	-

Data/Parameter	P_4
Data unit	t
Description	Quantity produced ethylene Stage IV
Time determine/control	Monthly. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source data used	Measurement
Data value	Projected production of ethylene Stage IV

(for the expected settlement/definitions)	Year: t 2008: 221 942 2009: 225 930 2010: 221 139 2011: 282 273 2012: 282 273
Justification of the choice of data or description of measurement methods and procedures that apply	Measuring the amount of ethylene produced by the Stage IV by the relevant means of measurement
Procedures for QA/QC, which are used	Measurement tools that are used when performing the measurements, subject to periodic verification or calibration
Comments	-

Data/Parameter	P_5
Data unit	t
Description	Quantity produced of HDPE
Time determine/control	Monthly. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source data used	Measurement
Data value (for the expected settlement/definitions)	Projected production of HDPE Yea: t 2008: 320 761,064 2009: 365 143,662 2010: 376 720,236 2011: 467 250,000 2012: 474 100,000
Justification of the choice of data or description of measurement methods and procedures that apply	Measuring the amount of HDPE produced by appropriate means of measuring
Procedures for QA/QC, which are used	Measurement tools that are used when performing the measurements, subject to periodic verification or calibration
Comments	-

Data/Parameter	P_6
Data unit	t
Description	Quantity produced LDPE Stage II
Time determine/control	Monthly. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source data used	Measurement
Data value	Projected production of LDPE Stage II

(for the expected settlement/definitions)	Year: t 2008: 76 341,800 2009: 73 228,300 2010: 67 832,300 2011: 77 000,000 2012: 77 000,000
Justification of the choice of data or description of measurement methods and procedures that apply	Measuring the amount of HDPE Stage II produced by appropriate means of measuring
Procedures for QA / QC, which are used	Measurement tools that are used when performing the measurements, subject to periodic verification or calibration
Comments	-

Data/Parameter	P_7
Data unit	t
Description	Quantity produced LDPE Stage III
Time determine/control	Monthly. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source data used	Measurement
Data value (for the expected settlement/definitions)	Projected production of LDPE Stage III Year: t 2008: 129 320,300 2009: 140 045,600 2010: 132 167,000 2011: 140 000,000 2012: 140 000,000
Justification of the choice of data or description of measurement methods and procedures that apply	Measuring the amount of HDPE Stage III produced by appropriate means of measuring
Procedures for QA / QC, which are used	Measurement tools that are used when performing the measurements, subject to periodic verification or calibration
Comments	-

Data/Parameter	P_8
Data unit	t
Description	Number of produced phenol
Time determine/control	Monthly. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source data used	Measurement
Data value	Projected production of phenol

(for the expected settlement/definitions)		Year	t
		2008	54 058
		2009	51 707
		2010	60 508
		2011	65 000
		2012	65 000
Justification of the choice of data or description of measurement methods and procedures that apply	Measuring the amount of phenol produced by the relevant means of measurement		
Procedures for QA/QC, which are used	Measurement tools that are used when performing the measurements, subject to periodic verification or calibration		
Comments	-		

Data/Parameter	$SEC_{1,elec}$
Data unit	MW·h/t
Description	Specific consumption of electrical energy for the production of ethylene Stage I
Time determine/control	Fixed value. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source data used	For this option was taken a fixed value based on historical data of ethylene production Stage I for 3 years (from 1999 to 2001) before the start of the project activity
Data value (for the expected settlement/definitions)	1,956
Justification of the choice of data or description of measurement methods and procedures that apply	Fixed value
Procedures for QA/QC, which are used	-
Comments	-

Data/Parameter	$SEC_{2,elec}$
Data unit	MW·h/t
Description	Specific consumption of electrical energy for the production of ethylene Stage II
Time determine/control	Fixed value. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source data used	For this option was taken a fixed value based on historical data of ethylene production Stage II for 3 years (from 1997 to 1999) before the start of the project activity
Data value (for the expected settlement/definitions)	2,447
Justification of the choice of data or description of measurement methods and procedures that apply	Fixed value
Procedures for QA/QC, which are used	-
Comments	-

Data/Parameter	$SEC_{3,elec}$
Data unit	MW·h/t
Description	Specific consumption of electrical energy for the production of ethylene Stage III
Time determine/control	Fixed value. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source data used	For this option was taken a fixed value based on historical data of ethylene production Stage III for 3 years (from 2001 to 2003) before the start of the project activity
Data value (for the expected settlement/definitions)	1,637
Justification of the choice of data or description of measurement methods and procedures that apply	Fixed value
Procedures for QA/QC, which are used	-
Comments	-

Data/Parameter	$SEC_{4,elec}$
Data unit	MW·h/t
Description	Specific consumption of electrical energy for the production of ethylene Stage IV
Time determine/control	Fixed value. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source data used	For this option was taken a fixed value based on historical data of ethylene production Stage IV for 3 years (from 1998 to 2000) before the start of the project activity
Data value (for the expected settlement/definitions)	1,732
Justification of the choice of data or description of measurement methods and procedures that apply	Fixed value
Procedures for QA/QC, which are used	-
Comments	-

Data/Parameter	$SEC_{5,elec}$
Data unit	MW·h/t
Description	Specific consumption of electrical energy for the production of HDPE Stage I
Time determine/control	Fixed value. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source data used	For this option was taken a fixed value based on historical data of production HDPE for 3 years (from 1997 to 1999) before the start of the project activity
Data value (for the expected settlement/definitions)	0,533
Justification of the choice of data or description of measurement methods and procedures that apply	Fixed value
Procedures for QA/QC, which are used	-
Comments	-

Data/Parameter	$SEC_{6,elec}$
Data unit	MW·h/t
Description	Specific consumption of electrical energy for the production of LDPE Stage II
Time determine/control	Fixed value. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source data used	For this option was taken a fixed value based on historical data of production LDPE Stage II for 3 years (from 1997 to 1999) before the start of the project activity
Data value (for the expected settlement/definitions)	1,001
Justification of the choice of data or description of measurement methods and procedures that apply	Fixed value
Procedures for QA/QC, which are used	-
Comments	-

Data/Parameter	$SEC_{7,elec}$
Data unit	MW·h/t
Description	Specific consumption of electrical energy for the production of LDPE Stage III
Time determine/control	Fixed value. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source data used	For this option was taken a fixed value based on historical data of production LDPE Stage III for 3 years (from 1997 to 1999) before the start of the project activity
Data value (for the expected settlement/definitions)	1,041
Justification of the choice of data or description of measurement methods and procedures that apply	Fixed value
Procedures for QA/QC, which are used	-
Comments	-

Data/Parameter	$SEC_{8,elec}$
Data unit	MW·h/t
Description	Specific consumption of electrical energy for the production of phenol
Time determine/control	Fixed value. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source data used	For this option was taken a fixed value based on historical data of production of phenol for 3 years (from 1997 to 1999) before the start of the project activity
Data value (for the expected settlement/definitions)	0,029
Justification of the choice of data or description of measurement methods and procedures that apply	Fixed value
Procedures for QA/QC, which are used	-
Comments	-

Data/Parameter	$SEC_{1,term}$
Data unit	Gcal/t
Description	Specific consumption of heat energy for the production of ethylene Stage I
Time determine/control	Fixed value. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source data used	For this option was taken a fixed value based on historical data of ethylene production Stage I for 3 years (from 1999 to 2001) before the start of the project activity
Data value (for the expected settlement/definitions)	4,486
Justification of the choice of data or description of measurement methods and procedures that apply	Fixed value
Procedures for QA/QC, which are used	-
Comments	-

Data/Parameter	$SEC_{2,term}$
Data unit	Gcal/t
Description	Specific consumption of heat energy for the production of ethylene Stage II
Time determine/control	Fixed value. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source data used	For this option was taken a fixed value based on historical data of ethylene production Stage II for 3 years (from 1997 to 1999) before the start of the project activity
Data value (for the expected settlement/definitions)	2,519
Justification of the choice of data or description of measurement methods and procedures that apply	Fixed value
Procedures for QA/QC, which are used	-
Comments	-

Data/Parameter	$SEC_{3,term}$
Data unit	Gcal/t
Description	Specific consumption of heat energy for the production of ethylene Stage III
Time determine/control	Fixed value. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source data used	For this option was taken a fixed value based on historical data of ethylene production Stage III for 3 years (from 2001 to 2003) before the start of the project activity
Data value (for the expected settlement/definitions)	1,619
Justification of the choice of data or description of measurement methods and procedures that apply	Fixed value
Procedures for QA/QC, which are used	-
Comments	-

Data/Parameter	$SEC_{4,term}$
Data unit	Gcal/t
Description	Specific consumption of heat energy for the production of ethylene Stage IV
Time determine/control	Fixed value. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source data used	For this option was taken a fixed value based on historical data of ethylene production Stage IV for 3 years (from 1998 to 2000) before the start of the project activity
Data value (for the expected settlement/definitions)	1,955
Justification of the choice of data or description of measurement methods and procedures that apply	Fixed value
Procedures for QA/QC, which are used	-
Comments	-

Data/Parameter	$SEC_{5,term}$
Data unit	Gcal/t
Description	Specific consumption of heat energy for the production of HDPE
Time determine/control	Fixed value. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source data used	For this option was taken a fixed value based on historical data of HDPE production for 3 years (from 1997 to 1999) before the start of the project activity
Data value (for the expected settlement/definitions)	0,576
Justification of the choice of data or description of measurement methods and procedures that apply	Fixed value
Procedures for QA/QC, which are used	-
Comments	-

Data/Parameter	$SEC_{6,term}$
Data unit	Gcal/t
Description	Specific consumption of heat energy for the production of LDPE Stage II
Time determine/control	Fixed value. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source data used	For this option was taken a fixed value based on historical data of production LDPE Stage II for 3 years (from 1997 to 1999) before the start of the project activity
Data value (for the expected settlement/definitions)	0,589
Justification of the choice of data or description of measurement methods and procedures that apply	Fixed value
Procedures for QA/QC, which are used	-
Comments	-

Data/Parameter	$SEC_{7,term}$
Data unit	Gcal/t
Description	Specific consumption of heat energy for the production of LDPE Stage III
Time determine/control	Fixed value. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source data used	For this option was taken a fixed value based on historical data of production LDPE Stage III for 3 years (from 1997 to 1999) before the start of the project activity
Data value (for the expected settlement/definitions)	0,629
Justification of the choice of data or description of measurement methods and procedures that apply	Fixed value
Procedures for QA/QC, which are used	-
Comments	-

Data/Parameter	$SEC_{8,term}$
Data unit	Gcal/t
Description	Specific consumption of heat energy for the production of phenol
Time determine/control	Fixed value. Data should be stored during the crediting period and another for 2 years after the last accrual of ERUs
Source data used	For this option was taken a fixed value based on historical data of production of phenol for 3 years (from 1997 to 1999) before the start of the project activity
Data value (for the expected settlement/definitions)	9,245
Justification of the choice of data or description of measurement methods and procedures that apply	Fixed value
Procedures for QA/QC, which are used	-
Comments	-