Informal translation

FEDERAL SERVICE FOR HYDROMETEOROLOGY AND ENVIRONMENTAL MONITORING

FIRST BIENNIAL REPORT OF THE RUSSIAN FEDERATION

Submitted in accordance with Decision 1/CP.16 of the Conference of the Parties to the United Nations Framework Convention on Climate Change

Moscow 2014

CONTENTS

I. INTRODUCTION

The First Biennial Report of the Russian Federation has been developed and submitted in accordance with the Decision 1/CP.16 of the Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC). The report includes the textual part and the Common Tabular Format (BR CTF) submitted electronically in accordance with the Decision 19/CP.18 of the Conference of the Parties to the UNFCCC. The report was prepared following the "UNFCCC biennial reporting guidelines for developed country Parties" as contained in the Annex I to Decision 2/CP.17 of the Conference of the Parties.

More detailed information on the issues concerned by this report can be found in the Sixth national communication of the Russian Federation submitted in accordance with the Articles 4 and 12 of the UNFCCC and the Article 7 of the Kyoto Protocol, and in the National inventory report on the anthropogenic emissions by sources and removals by sinks of the greenhouse gases not controlled by the Montreal Protocol for 1990–2011.

The Department for Scientific Programs, International Cooperation, and Information Resources of the Roshydromet performed the institutional governance over the development of the report. The methodological guidance, preparation, and editorial revision were performed by the Institute of Global Climate and Ecology, Federal State Budgetary Institution under Roshydromet and Russian Academy of Sciences.

II. INFORMATION ON THE GREENHOUSE GAS EMISSIONS AND TRENDS

This chapter includes the estimates of anthropogenic emissions and removals of the greenhouse gases (GHG) not controlled by the Montreal Protocol for 1990-2011 over the territory of the Russian Federation and a brief information on the organizational structure and the procedures for the development the National inventory report on the anthropogenic emissions by sources and removals by sinks of the greenhouse gases not controlled by the Montreal Protocol. In accordance with the Decision 2/CMP.17 of the Conference of the Parties to the UNFCCC, the data contained in this chapter correspond to that of the last inventory report, which was officially submitted to the UNFCCC in 2013.

A. Greenhouse gas emissions and trends

The cumulative anthropogenic emission of greenhouse gases in the Russian Federation comprised to 2 320,8 Mt CO_2-equivalent, excluding the Land Use, Land-Use Change and Forestry. This value corresponds to 69,2 per cent of total emission in 1990 or 113,4 per cent of total emission in 2000. With the inclusion of the emissions and removals from the Land Use, Land-Use Change and Forestry (LULUCF), in 2011 the total emission was 1 692,4 Mt CO_2-equivalent (49,3 per cent of the total emission in 1990 or 106,5 per cent of total emission in 2000).

The trends of greenhouse gas (GHG) emissions and removals by sectors[1] in the Russian Federation are presented in Table II.1 and Figure II.1. Significant decrease of emissions is associated with the general economic situation in the country in 1990-1998. The recession affected all sectors. The emissions demonstrated sustained growth in 1999-2008, during the overall economic recovery (both in production and consumption), and the rate of emission increase was much lower than the rate of their decrease in the 1990. For example the level of total emission excluding the LULUCF decreased by 1 355,6 Mt CO_2-eq from 1990 to 1998, and increased by only 190,4 Mt CO_2-eq from 2000 to 2008. The decrease in emissions as an outcome of the global economic crisis was observed in the Russian Federation in 2009. The emissions increased again in 2010-2011, as a result of post-crisis economic recovery.

[1] *The terms «energy», «energy sector» are used in this Chapter in the sense they are used in the Kyoto Protocol (Annex A) and the IPCC methodological guidelines: the energy sector includes the combustion of all fossil fuel types and the processes that lead to fugitive emissions (technological emissions and leaks) to the atmosphere of fuel products regardless the economic sector, where they occur.*)

Table II.1

The GHG emissions and removals by sectors, Kt CO_2-eq

Sector	1990	1998	2000	2005	2006	2007	2008	2009	2010	2011
Energy	2 714 711	1 645 729	1 668 023	1 739 310	1 796 383	1 791 755	1 834 144	1 737 236	1 824 317	1 920 401
Industrial processes, Solvent and Other Product Use	257 993	134 624	167 206	179 072	187 968	191 254	180 925	158 682	173 268	175 531
Agriculture	318 118	161 834	152 980	141 681	140 574	143 234	148 025	147 325	141 854	144 044
Land Use, Land-Use Change and Forestry[1)]	84 514	-386 605	-457 927	-540 532	-520 302	-550 180	-578 461	-646 606	-650 613	-628 435
Wastes	61 122	54 184	58 828	68 687	71 171	73 285	74 326	78 179	77 832	80 858
Total without LULUCF[2)]	3 351 944	1 996 371	2 047 036	2 128 750	2 196 097	2 199 528	2 237 420	2 121 422	2 217 271	2 320 834
Total with LULUCF[2)]	3 436 458	1 609 766	1 589 110	1 588 217	1 675 796	1 649 348	1 658 959	1 474 816	1 566 658	1 692 400

[1)] Sign «minus» means net absorption, i.e. removals of the greenhouse gases from the atmosphere.
[2)] Land Use, Land-Use Change and Forestry.

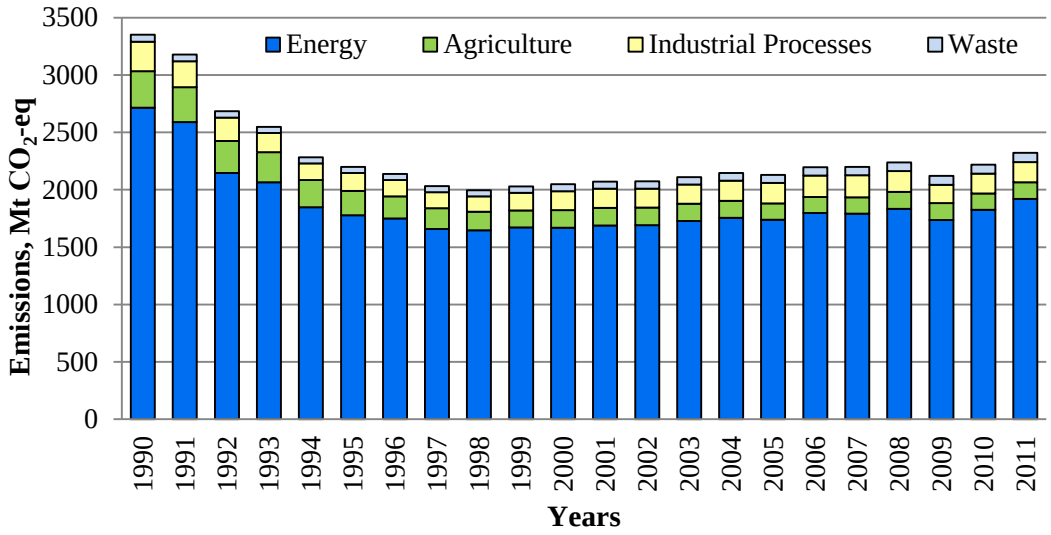

Figure II.1. The GHG emission trend for 1990-2011, excluding the Land Use, Land Use Change, and Forestry sector

The distribution of emissions by sectors did not undergo substantial change in 1990-2011. Energy sector still dominates in the emission structure with a share of 82,7 per cent in 2011 (Figure II.2). The share of agricultural sector decreased by 3,3 per cent, and contribution of the Industrial Processes was almost unaltered (the change is by 0,1 per cent). The contribution of Waste sector slightly increased from 1990. Solvent and Other Product Use contributed insignificantly to total emission (0,02 per cent) and is not displayed in the Figure II.2.

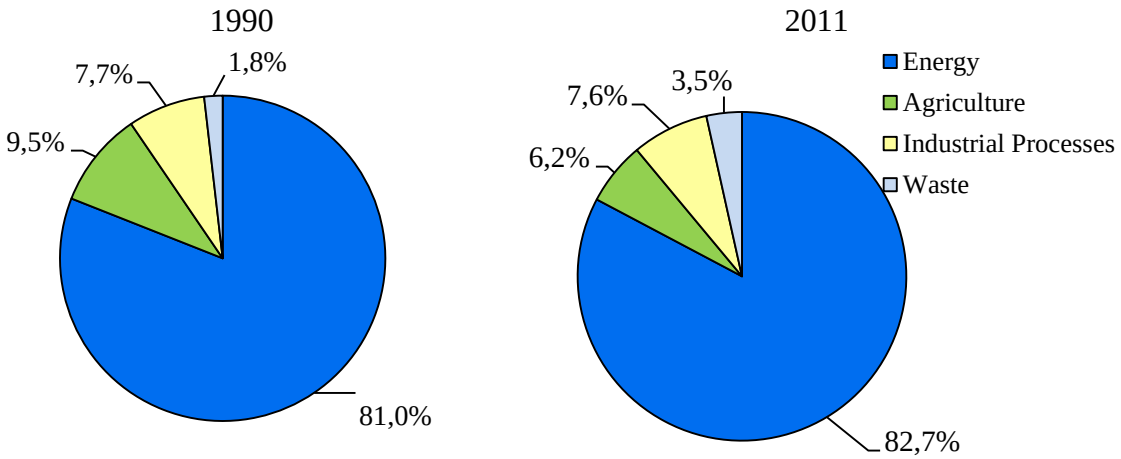

Figure II.2. The distribution of total GHG emissions (CO_2-eq) by sectors in 1990 and 2011

The contributions of particular greenhouse gases to total emission are illustrated in Figure II.3. The CO_2 plays the leading role coming mostly from the energy sector (fossil fuel combustion). The share of methane (CH_4) raised to 21,8 per cent. Some decrease of N_2O share is due to decline in application of nitrogen fertilizers caused by the difficult economic situation in the agricultural enterprises.

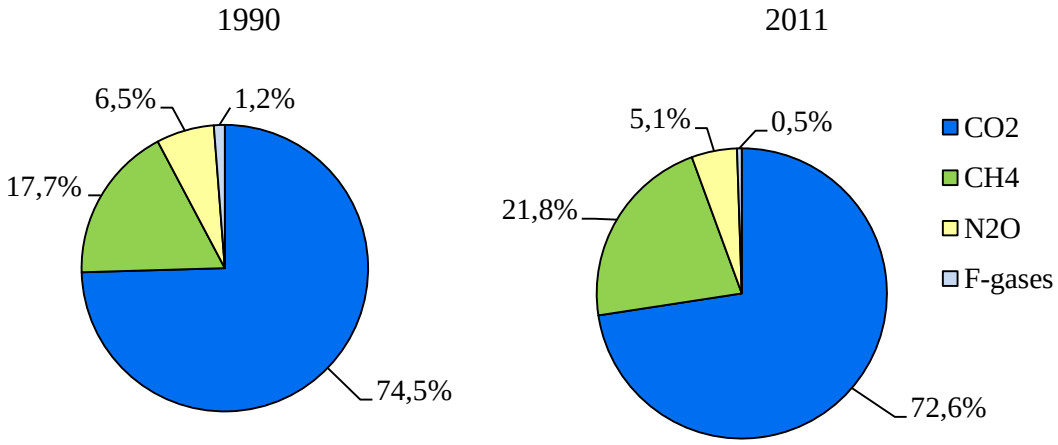

Figure II.3. The shares of particular greenhouse gases in total emission (CO_2-eq) in 1990 and 2011 (excluding the Land Use, Land-Use Change and Forestry)

Extraction, transportation, processing, and utilization of different fossil fuels provide the highest contribution to the GHG emissions. The emissions from these processes fall into Energy sector. The emissions are mostly connected with combustion of extracted in the Russian Federation fossil fuels (oil, natural and associated petroleum gases, coal, and to much less extent peat and oil shale), and their processing products. The GHG emissions by main source categories in the Energy sector for 1990, 1998, 2000 and the period from 2005 to 2011 are presented in Table II.2

Table II.2

The GHG emissions in the Energy sector, Kt CO_2-eq

Source categories	**Газ**	**1990**	**1998**	**2000**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Fuel combustion	CO_2	2 264 399	1 310 665	1 319 981	1 343 174	1 388 972	1 375 939	1 426 807	1 360 593	1 411 661	1 491 117
	CH_4	11 276	3 678	3 056	3 332	3 437	3 287	3 337	3 223	3 387	3 597
	N_2O	6 587	3 996	4 241	4 868	5 114	5 219	5 884	6 008	6 639	7 482
Fugitive emissions from fuels	CO_2	22 576	15 708	16 930	28 932	29 370	35 585	25 321	26 169	33 283	35 972
	CH_4	409 794	311 626	323 755	358 902	369 386	371 600	372 706	341 151	369 229	382 105
	N_2O	80	56	60	103	104	126	90	93	118	128

Metallurgy is the main source of emissions in the Industrial Processes sector. In 2011, it contributed to 52,9 per cent of total greenhouse gas emission. The second most important source is mineral products industry providing for 28,6 per cent. Emissions of chemical industry contribute to 12,9 per cent. The GHG industrial emissions by source categories are presented in Table II.3 for 1990, 1998, 2000 and the period from 2005 to 2011.

Table II.3

The greenhouse gas emissions from Industrial Processes, Solvent and Other Product Use, Kt CO_2-eq

Source category	**Gas**	**1990**	**1998**	**2000**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Mineral Products	CO_2	84 213	30 603	37 968	47 532	51 034	54 958	50 637	41 280	46 764	50 027
Chemical Industry	CO_2	18 665	11 554	15 006	16 720	17 318	17 347	16 543	16 424	16 756	17 475
	CH_4	424	164	257	389	389	414	407	325	386	410
	N_2O	3 735	2 011	2 652	3 622	3 627	3 834	3 443	4 422	4 564	4 728
Metal Production	CO_2	108 690	64 214	81 453	88 431	95 171	95 075	90 043	81 958	89 747	89 841
	CH_4	413	248	315	333	343	356	337	254	281	284
	F-gases	11 654	7 136	7 222	4 607	4 086	3 671	3 496	2 372	2 556	2 392
Production and consumption of F-gases	F-gases	29 638	18 177	21 810	16 906	15 468	15 058	15 477	11 090	11 649	9 804
Solvent and Other Product use	N_2O	562	517	523	532	532	541	544	558	565	571

The emissions of greenhouse gases by source categories in the agriculture of Russia in 1990, 1998, 2000, and for the period 2005-2011 are presented in Table II.4. In 2011, the emissions from agriculture comprised 134.7 Mt CO_2-eq, by 54.7 per cent lower than in 1990. Enteric fermentation (CH_4), systems for animal and poultry manure management (N_2O) and decomposition of plant residues (N_2O) are the most important sources in the agriculture.

Table II.4

The greenhouse gas emissions in Russian agriculture, Kt CO_2-eq

Source categories	Gas	1990	1998	2000	2005	2006	2007	2008	2009	2010	2011
Enteric Fermentation	CH_4	99339	51654	45549	40848	39765	39833	40237	40108	38582	37812
Manure Management Systems	CH_4	13803	6099	5481	4427	4394	4680	4780	4635	4622	4775
	N_2O	43375	22025	19677	18876	18632	19164	19696	19735	19426	18821
Rice Cultivation	CH_4	1627	767	919	726	822	816	827	922	1024	1064
Direct Emissions from Agricultural Soils	N_2O	102187	57191	58387	55974	56089	56927	59658	59164	56061	59376
Pasture Range and Paddock	N_2O	10342	5729	5542	4890	4821	4871	4858	4746	4522	4548
Indirect Emissions from Agricultural Soils	N_2O	47444	18369	17425	15939	16052	16942	17970	18016	17616	17648

The net flux of greenhouse gases for the Land Use, Land-Use Change and Forestry (LULUCF) sector significantly depends on the balance of carbon dioxide removals by forests and the emissions mostly related to harvesting operations and fire events. The main reason for forests being the carbon sink within the review period is due to twofold decrease of forest utilization in comparison with the 1990. Also the trend observed in the LULUCF sector is partly associated to reduction of the emission from permanent croplands, caused by the decrease in total land area and by sharp decline of amount of organic fertilizers applied in the early 1990s.

The greenhouse gas emissions and removals by in the LULUCF sector are presented in Table II.5. In 1990-1991, the sector was the source, but since 1992 it has become the sink of greenhouse gases. The LULUCF sector provided for the removal of 628,4 Mt CO_2-eq in 2011, promoting the decrease of net national emissions by 27,1 per cent. As follows from the Table II.5, the managed forests and grasslands (haylands and pastures) were the sink of the CO_2. Timber production, fires, conversion of forest lands to settlements (deforestation) and drainage flooded forest lands are the sources of CO_2 emissions. Destruction of organic matter owing to land cultivation and liming are the main sources of CO_2 under land use. Emissions of other greenhouse gases (CH_4 and N_2O) are mainly related to forest fires.

Table II.5

Emissions and removals of greenhouse gases in Land Use, Land-Use Change and Forestry sector, Kt CO_2-eq[1)]

Category	Gas	1990	1998	2000	2005	2006	2007	2008	2009	2010	2011
Forest lands	CO_2	-231 778	-545 644	-590 063	-608 976	-622 071	-623 081	-640 521	-704 913	-709 981	-674 692
	CH_4	10 036	13 410	9 875	9 643	10 601	9 609	10 955	11 669	10 434	10 516
	N_2O	8 450	11 204	8 303	8 089	8 872	8 061	9 158	9 741	8 732	8 799
Croplands	CO_2	268 572	216 066	163 824	123 142	128 799	108 579	85 782	77 751	100 078	82 869
Grasslands	CO_2	-7 433	-120 812	-89 350	-109 392	-84 253	-90 180	-81 191	-76 901	-83 595	-78 623
	CH_4	147	336	309	145	462	282	225	232	216	148
	N_2O	198	453	416	196	623	380	303	313	291	200
Wetlands	CO_2	1	1	1	1	1	1	1	1	0	0
	N_2O	147	128	121	103	103	101	100	98	96	95
Settlements	CO_2	36 175	38 253	38 638	36 516	36 563	36 068	36 728	35 404	23 115	22 254
Total		84 514	-386 605	-457 927	-540 532	-520 302	-550 180	-578 461	-646 606	-650 613	-628 435

[1)] Sign «minus» means net removals of greenhouse gases from the atmosphere.

The emissions of greenhouse gases in the Waste sector in 1990, 1998, 2000, and from 2005 to 2011 are presented in Table II.6. Solid Waste Disposal on Land made the highest contribution to emission. The share of this source increased from 40,6 per cent in 1990 to 63,4 per cent in 2011. Since 1990, the share of industrial and domestic wastewater treatment has decreased by 8,7 and 7,0 per cent correspondingly. Despite the high global warming potential of the N_2O, its emission from human sewage provides for the minimum contribution.

Table II.6

Emissions connected with production and consumer waste, thousand tons CO_2-equivalent.

Source categories	Gas	1990	1998	2000	2005	2006	2007	2008	2009	2010	2011
Solid Waste Disposal on Land	CH_4	28 200	33 007	34 854	40 567	42 263	43 807	44 776	49 224	48 750	51 285
Industrial Wastewater Handling	CH_4	17 286	7 395	10 664	14 500	15 239	15 737	15 958	15 361	15 325	15 875
Domestic and Commercial Wastewater Handling	CH_4	11 417	10 067	9 777	9 733	9 750	9 641	9 547	9 520	9 496	9 431
Human sewage	N_2O	4 219	3 716	3 532	3 888	3 919	4 101	4 044	4 074	4 260	4 267

B. Development of the National Inventory Report

The Russian system for assessment anthropogenic emissions by sources and removals by sinks of greenhouse gases not controlled by the Montreal Protocol on ozone-depleting substances[2] (hereinafter referred as the National System) was established in order to realize the national commitments of the Russian Federation under the Kyoto Protocol.

The National System was established for:

- Estimation the scale of anthropogenic emissions by sources and removals by sinks of the greenhouse gases;
- Annual submission of the corresponding data in the form of national inventory report on anthropogenic emissions by sources and removals by sinks of greenhouse gases in accordance with requirements of the UNFCCC and Kyoto Protocol;
- Preparation of reports, submitted by the Russian Federation in accordance with requirements of the UNFCCC and Kyoto Protocol;
- Provision of information to central and local authorities, organizations and public on the scale of anthropogenic emissions by sources and removals by sinks of greenhouse gases;
- Development of measures for mitigation (reduction) anthropogenic emissions by sources and enhancement of removals by sinks of greenhouse gases.

The Federal Service for Hydrometeorology and Environmental Monitoring (Roshydromet) carries the functions of authorized national entity for the National System.

[2] *Government of Russian Federation Order № 278-p of March 1, 2006.*

Roshydromet is responsible for ensuring the functioning of the National System and submission of the national inventory report and other necessary information. In the capacity of the authorized national entity for the National System, Roshydromet together with the Ministry of Economic Development, Ministry of Natural Resources and Environment, Ministry of Industry and Energy, Ministry of Transport, Ministry of Agriculture, Ministry of Regional Development, Federal Service for State Statistics (Rosstat) and Federal Service for Environmental, Industrial and Nuclear Supervision of the Russian Federation[3] developed Procedure for formation and functioning of the National System including the identification state statistical and other data and information on methods for their collection and treatment. In accordance with the Procedure,[4] the above federal authorities must annually provide to Roshydromet the data and supplies necessary for preparation of the inventory report.

In case of necessity Roshydromet can involve into preparation of the report not committed to the National System ministries and institutions, companies, research and other organizations. Alongside the ministries and entities, the National System also involves some industrial companies.

Within the framework of the National Systems, the Institute of Global Climate and Ecology under the Roshydromet and Russian Academy of Sciences (IGCE), the federal state budgetary institution, carries out the functions for collection, treatment and storage of supplies and data on the assessment of emissions and removals of the greenhouse gases by categories and IPCC sectors, and preparation of the drafts of the national inventory reports and other deliverables for submitting to UNFCCC and Kyoto Protocol bodies and to the governmental authorities concerned.

Procedure for archiving and storage of data, supplies and estimates of emissions and removals and deliverables is regulated by a special internal document of the IGCE[5].

Activity data on GHG emission categories for energy, industry, agriculture, forestry and other sectors of economy and necessary methodical information are collected by the IGCE with the use of the federal statistic system, information and analytic products of ministries and other federal entities, Russian companies, international organizations and scientific-technical and production literature. The 1996 Revised IPCC Guidelines (IPCC, 1997), Good Practice Guidance (IPCC, 2000; IPCC, 2003) and other guidance based on the Russian experience on the national inventory development and scientific researches form the methodical basis for the inventory development. The 2006 IPCC Guidelines (IPCC, 2006) are currently used to a limited extent, mostly as a source of emission factors and other parameters.

The measures on verification, quality assurance and control of the activity data and greenhouse gas emission and removals estimates are an important component of the work. These are performed on a permanent basis. The quality assurance and quality control procedures are multi-level in nature. Primary quality assurance and control of the activity

[3] *The titles of federal executive bodies are given in accordance with the text of the Order of the Government of the Russian Federation № 278-p of March 1, 2006.*
[4] *Registered by the Ministry of Justice of the Russian Federation September 29, 2006, Reg. № 8335.*
[5] *Procedure for storage and archiving in the state institution Institute of Global Climate and Ecology under Roshydromet and Russian Academy of Sciences of data concerning the National inventory of anthropogenic emissions by sources and removals by sinks of the greenhouse gases in the Russian Federation. IGCE. –M., 2007.*

data series is performed in accordance with the internal departmental procedures by the institutions and entities responsible for these data collection and generalization. The IGCE in turn, performs secondary verification, quality assurance and control through the comparison of the data from different sources, consistency checks for the time series and with other methods. Quality assurance and quality control in the inventory estimates are also performed in two stages. At the first stage, correctness of calculations, methods, activity data and parameters is checked in the IGCE in accordance with the internal regulation[6]. At the second stage, independent verification of the inventory is made as the result of the distribution of the draft national inventory report to corresponding federal executive authorities as well as through the review of the sector estimates or particular categories by independent experts.

Recalculation of the previous estimates of emissions and removals is performed as the result of the comments received and can also be made on receipt of more detailed or revised activity data, elaboration the national emission factors or the improvement of methodological approaches to emission estimate. Many recalculations are performed in response to recommendations of the UNFCCC expert reviews of national inventory report. The inventory improvement plan is developed by the IGCE at the beginning of each inventory cycle.

The final version of the national inventory report with the introduced comments of the ministries and federal entities concerned is submitted by the Roshydromet to the Ministry of Natural Resources and Environment, and then to the Government of the Russian Federation. After consideration by the Government, the National Inventory Report is submitted by the Roshydromet to the UNFCCC Secretariat. The general pattern of the National System functioning is presented in Figure II.4.

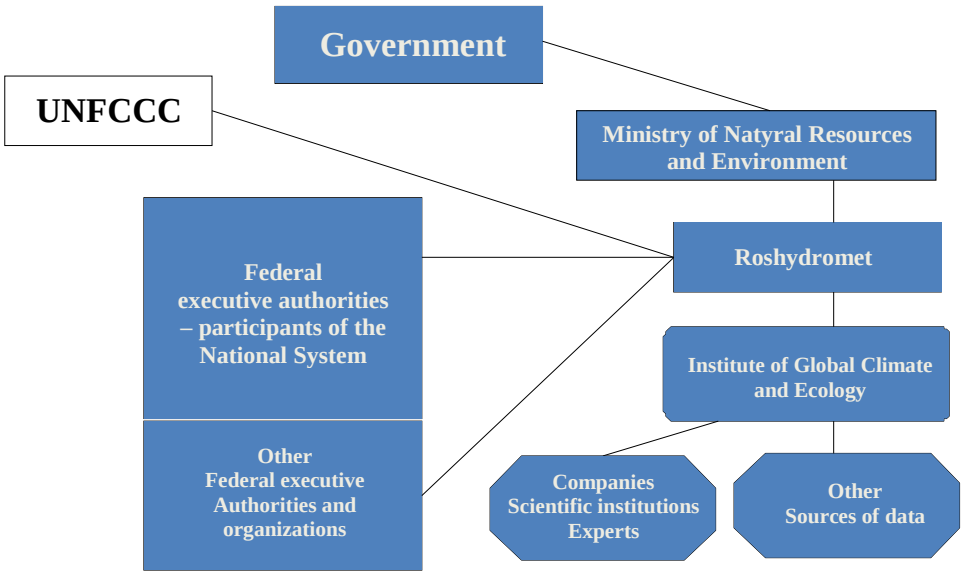

Figure II.4. National System of the Russian Federation (as of 2013)

[6] *The Order of quality assurance and quality control of the national inventory report of the anthropogenic emissions by sources and removals by sinks of greenhouse gases in Russian Federation developed by the IGCE under Roshydromet and Russian Academy of Sciences. IGCE. –M., 2007.*

The National System is arranged according the hierarchical principle and is composed of several levels of structural arrangement with fixed inter-linkages enabling the acquisition of the data with required degree of detail and performance the estimations. The data sources and information flows have been identified, which form the basis for the national greenhouse gas emission calculations and assessment of the efficiency of corresponding policies and measures in different sectors of the national economy.

The flow chart of the national inventory development is presented in Figure II.5. As it is seen from the figure, the development includes collection and primary treatment of the economic and other activity data by means of responsible ministries and federal entities, conversion of the data obtained into calculation formats; assessment of completeness and preparation of intermediate data for subsequent calculations; particular calculations of the emissions and removals of greenhouse gases. Furthermore, the procedures of verification, internal and external control of the inventory quality are performed. Following the instruction of the Government of the Russian Federation, the final annual inventory report is submitted to the UNFCCC and Kyoto Protocol bodies via UNFCCC Secretariat. The inventory data are also provided to other consumers and published in the periodicals of Roshydromet and Rosstat.

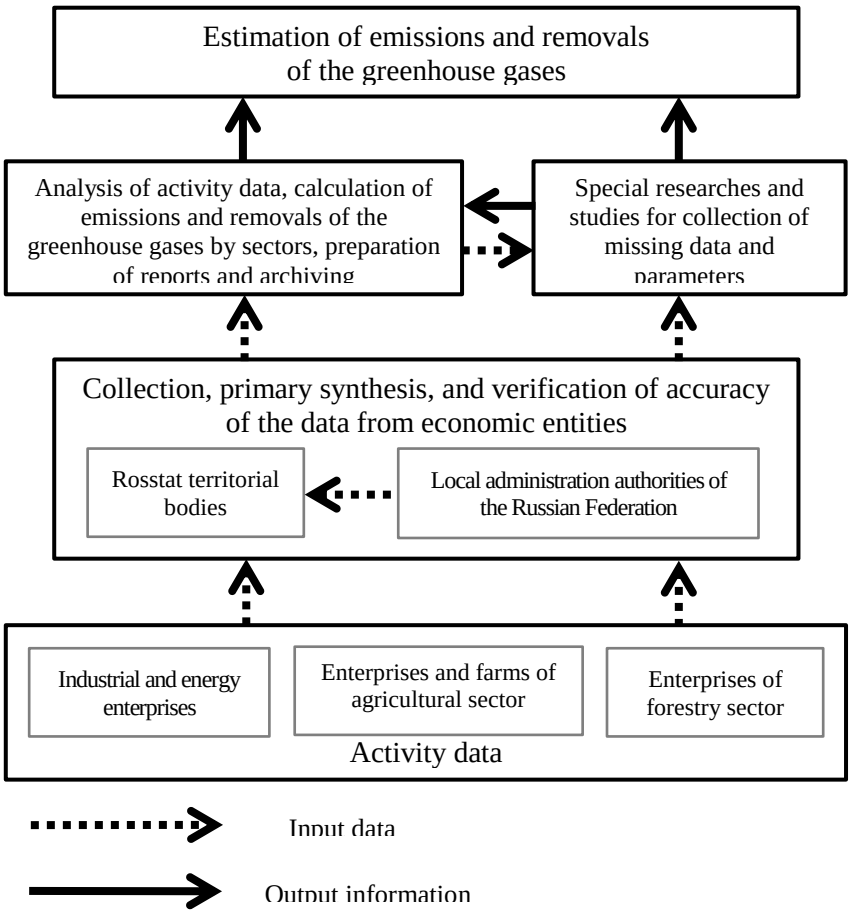

Figure II.5. A flow chart of the inventory of anthropogenic emissions and removals of the greenhouse gases

III. QUANTIFIED ECONOMY-WIDE EMISSION REDUCTION TARGET

In accordance to the commitments of the Russian Federation as a Party to the Kyoto Protocol to the United Nations Framework Convention on Climate Change, its total anthropogenic emission of greenhouse gases in the first period of the implementation of the Protocol (2008-2012) shall not exceed 100 per cent of fivefold emission of these gases in the base year[7]. The Russian Federation has no commitments on the quantitative reduction or limitation of the greenhouse gas emissions in the second commitment period of the Kyoto Protocol.

The Decree of the President of the Russian Federation "On Reduction of the Greenhouse Gas Emissions" № 752 of September 30, 2013, adopted for the purpose of the implementation the Climate Doctrine of the Russian Federation[8], the Government of the Russian Federation has been assigned for:

- ensure the reduction by the year 2020 the amount of the greenhouse gas emissions to the level no more than 75 per cent of theses emissions in the year 1990;
- approve the plan of action to ensure the achievement of the assigned amount of GHG emissions within the 6-month period and foresee in it the development of the parameters for the GHG emission reductions of by sectors of economy.

The federal executive authorities in the Russian Federation are currently developing the above action plan. More detailed information on the quantified emission reduction target will be made available after the approval of the plan.

[7] *For the purpose of fulfillment of the commitments under the Kyoto Protocol, the base year for the Russian Federation is the 1990 for CO_2, CH_4 u N_2O, and the 1995 for HFC, PFC, and SF_6.*

[8] *Approved by the Order of the President of the Russian Federation № 861-rp of December 17, 2009.*

IV. PROGRESS IN ACHIEVEMENT OF QUANTIFIED ECONOMY-WIDE EMISSION REDUCTION TARGET AND RELEVANT INFORMATION

A. Mitigation actions and their effects

National policy and measures to mitigate climate change are developed and fulfilled in three main directions:

- Legislative and regulatory acts and targeted measures providing the fulfillment of the national commitments under the UNFCCC and Kyoto Protocol;
- National programs including the programs of economic and social development, envisaging a set of measures for mitigation the anthropogenic emissions of greenhouse gases, protection and enhancement the quality of removals of greenhouse gases and their reservoirs;
- Other national programs and measures, implementation of which promotes for the reduction of emission or enhancement of removals of the greenhouse gases.

Programs and measures promoting reduction of the emissions and enhancement of the removals of greenhouse gases can be implemented at federal and regional levels and by separate institutions (sector, agency and corporate innovation and technologic programs). The measures on application the market mechanisms, gradual decrease or removal of market imbalances, fiscal and other economic incentives are the integral part of the national policy and measures to mitigate the climate change.

The most important legislative and regulatory acts that came into operation before January 1, 2010 and currently under the implementation or have no limitation in the validity period include:

- Order of the Government of the Russian Federation on the establishment of the Russian registry of carbon units with the aim at fulfillment of the commitments under the Kyoto Protocol (2006);
- Order of the Government of the Russian Federation on the establishment of the Russian system for assessment anthropogenic emissions by sources and removals by sinks of greenhouse gases not controlled by the Montreal Protocol on ozone-depleting substances with the aim at fulfillment of the commitments under the Kyoto Protocol Article 5, paragraph 1, (2006);
- Regulation of the Government of the Russian Federation on the procedure for the approval and control of the progress of the implementation of the projects under Article 6 of the Kyoto Protocol to the UNFCCC (2007);
- Order of the Government of the Russian Federation on the simplification of the procedure of approval, implementation and control of the progress of the projects under Articles 6 and 17 of the Kyoto Protocol (2009);
- Order of the Government of the Russian Federation on assignment of the Savings Bank of Russia Joint-stock Company as the entity empowered to participate in the GHG emission trading with the aim at fulfillment the quantified commitments of the Russian Federation on limitation and reduction of the emissions of the greenhouse gases (2009).

With the purpose of the implementation of the flexibility mechanisms of the Kyoto Protocol (Articles 6, 12 and 17), the federal laws were adopted in 2010–2011, which formed the basis for amendments to the Federal Budget (Federal Law of July 23, 2010, № 185-FZ) and Code of Taxation of the Russian Federation (Federal Law of July 19, 2011, № 245-FZ). In 2011, the Government of the Russian Federation set a limit of 300 million for the operations with the GHG emission reduction units (Regulation of the Government of the Russian Federation "On the measures for the implementation of the Article 6 of the Kyoto Protocol to the United Nations Framework Convention on Climate Change", September 15, 2011, № 780).

According to the data of the Savings Bank of Russia JSC, almost 150 applications were submitted in the Russian Federation for the investment projects under the Article 6 of the Kyoto Protocol with the total amount of emission reductions equal to 381,3 Mt CO_2-eq. The Ministry of Economic Development of the Russian Federation approved 108 investment projects in 2010–2012. The project activities encounter the key sectors of Russian economy including oil and gas, chemical and coal mining industries, ferrous and non-ferrous metallurgy, thermal and hydro energy, forest industry, housing and utilities sector, waste treatment, forestry and agriculture. More than 250 Russian companies participated in project implementation. The chemistry, ferrous metallurgy and energy installations are responsible for emission reductions equal to 55, 56 and 46 Mt CO_2-eq respectively.

Because the limit for operations with the GHG emission reduction units set by the Government of the Russian Federation Regulation No 780 was reached, the Ministry of Economy Development stopped the procedure of approval the projects in May 2012.

The Climate Doctrine of the Russian Federation approved by the Order of the President of the Russian Federation on December 17, 2009, № 861-rp, is the most important national program that envisaged a set of measures on reduction of anthropogenic emissions, protection and enhancement of quality of removals and reservoirs of the greenhouse gases. It represents the publicly available document reflecting the long-term position of the Russian Federation with regard to the climate change. According to the Climate Doctrine, provision of the safe and sustainable development of the country including the institutional, economic, environment and social (including demographic) aspects under the changing climate and corresponding threats and challenges is the strategic target of climate-related policy of the Russian Federation. The provisions of the Doctrine take into consideration the commitments under the UNFCCC and other international conventions including those on the environment and sustainable development. In 2011, the Government of the Russian Federation approved the Integrated plan for implementation of the Climate Doctrine for the period through to 2020.

The Concept of the Long-term Social and Economic Development of the Russian Federation through to 2020 was approved by the Order of the Government of the Russian Federation of November 17, 2008, № 1662. The Concept was developed with a view of the climatic risks ant takes into consideration the tasks of mitigation the anthropogenic effects on climate and adaptation to climate change. It envisages gradual reduction of environmental impact of the anthropogenic sources of pollutants and greenhouse gases. It also identified the strategy for the objectives, form and mechanisms of strategic partnership between the state, business and society. The Concept acquires the targets and priorities for domestic and international economic policy, indicators and main tasks for long-term state social, scientific and technologic policy as well as the structural reforms in the economy.

The Basic Principles of the State Policy in the Field of Environmental Development of the Russian Federation for the Period until 2030 were approved by the President of the Russian Federation on April 30, 2012. The override priority of the policy is to ensure the environmentally oriented growth of economy, preservation of favorable environment, biological diversity and natural resources for satisfying the requirements of living and future generations, enforcement of the right of the every human for favorable environment, enforcement of the environment protection legislation and of the environmental safety. The Russian Federation Government adopted the Action Plan to implement the Basic Principles of the State Policy in the Field of Environmental Development.

The Ministry of Natural Resources and Environment of the Russian Federation together with the federal entities concerned has developed and currently implements the state program "Environmental protection" for the years 2012-2020 that was adopted by the Order of the Government of the Russian Federation on December 27, 2012, № 2552-r.

Detailed description of the national policy and measures in energy, industry and construction, transport, forestry, agriculture and waste sectors is provided in the Sixth National Communication of the Russian Federation submitted in 2013 in accordance with the Articles 4 and 12 of the UNFCCC and the Article 7 of the Kyoto Protocol.

B. Estimates of emission reductions and removals and the use of units from the market-based mechanisms and land use, land-use change and forestry activities

The anthropogenic emission of greenhouse gases in the Russian Federation in the base year 1990 excluding the Land Use, Land-Use Change and Forestry sector comprised 3 351 944,01 Kt CO_2-eq (3 351 944,01 Gg CO_2-eq).

As per the totality of emissions and removals of greenhouse gases by all sources and sinks in 1990, the Land Use, Land-Use Change and Forestry sector was the source of atmospheric emission. The net emission from the sector comprised 84 514,45 Kt CO_2-eq (84 514,45 Gg CO_2-eq) in 1990. This value was obtained on the basis of the methods given in the updated UNFCCC reporting guidelines on annual inventories following the incorporation of the provisions of decision 14/CP.11.[9]

More detailed information on the GHG sources and removals and the description of the approaches and methods used to estimate the emissions and removals in this sector is presented in Chapter II of this report and in the National Inventory Report of the Anthropogenic Emissions by Sources and Removals by Sinks of the Greenhouse Gases[10].

In the base year 1990, the cumulative anthropogenic emission of greenhouse gases including the Land Use, Land-Use Change and Forestry sector in the Russian Federation was 3 436 458,46 Kt CO_2-eq (3 436 458,46 Gg CO_2-eq).

In 2011, the cumulative anthropogenic emissions of greenhouse gases comprised 2 320 834,38 Kt CO_2-eq excluding the Land Use, Land-Use Change and Forestry sector and 1 692 399,52 Kt CO_2-eq including the LULUCF sector. The LULUCF sector as a whole is the net removal of the greenhouse gases with the amount of 628 434,86 Kt CO_2-eq.

The data on cumulative reduction of the greenhouse gas emissions in the Russian Federation are presented in Table IV.1 and in Figure IV.1. The total cumulative GHG reduction within the period after 1990 reached 23,4 billion tons CO_2-eq.

[9] *UNFCCC FCCC/SBSTA/2006/9.*

[10] *Russian Federation. The National Inventory Report of the Anthropogenic Emissions by Sources and Removals by Sinks of the Greenhouse Gases not Controlled by the Montreal Protocol in 1990–2011. M., 2013.*

Table IV.1

The cumulative greenhouse gas emission reduction (excluding the LULUCF sector)

	1990	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**
Change in total annual emission, per cent in relation to 1990	0,0	-5,2	-19,9	-24,0	-31,9	-34,4	-36,3	-39,4	-40,4	-39,5	-38,9
Cumulative reduction, billion tons CO_2-eq	0,0	0,2	0,8	1,6	2,7	3,9	5,1	6,4	7,8	9,1	10,4
	2001	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Change in total annual emission, per cent in relation to 1990	-38,2	-38,2	-37,0	-36,0	-36,5	-34,5	-34,4	-33,3	-36,7	-33,9	-30,8
Cumulative reduction, billion tons CO_2-eq	11,7	12,9	14,2	15,4	16,6	17,8	18,9	20,0	21,3	22,4	23,4

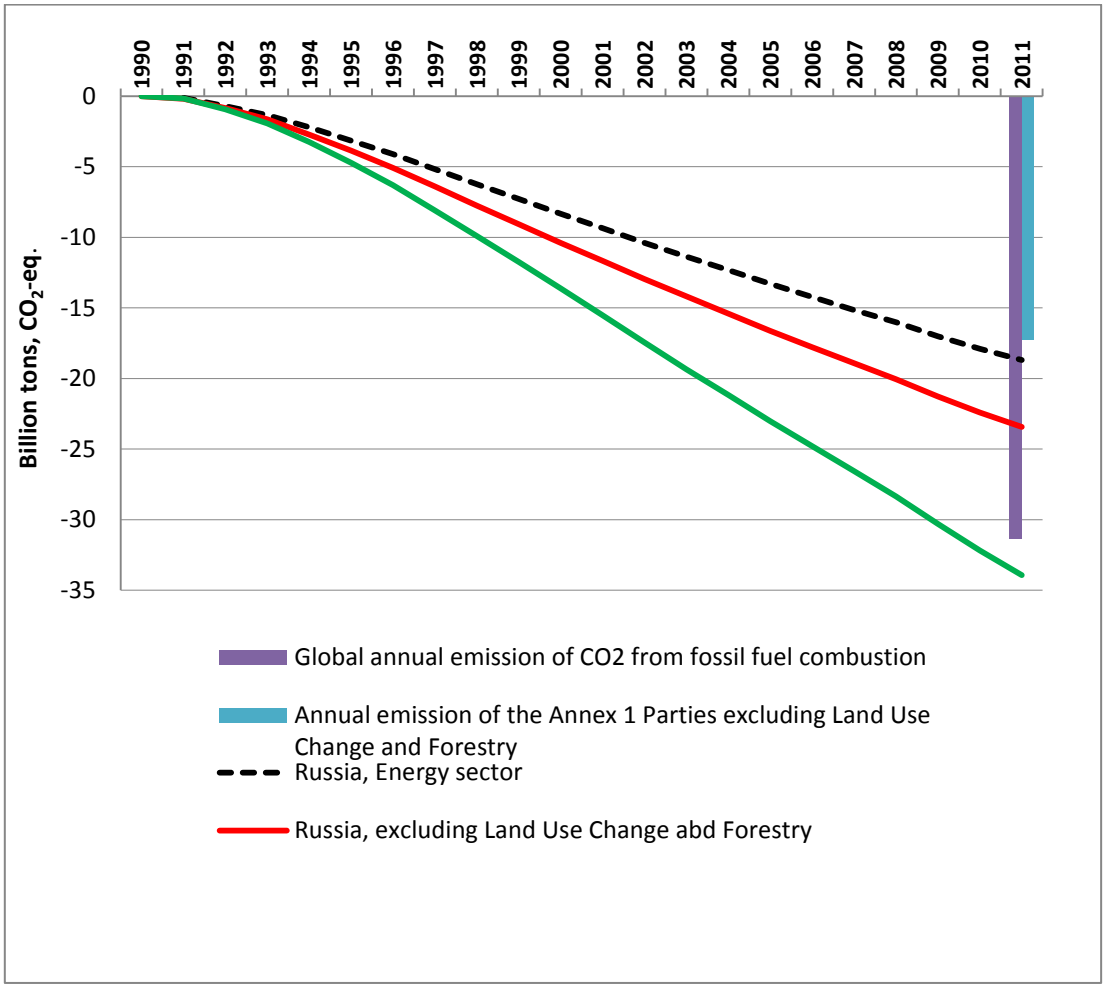

Figure IV.1. The cumulative greenhouse gas emission reduction in the Russian Federation

Up to now, Russian Federation did not acquire from other UNFCCC Parties the units from the market-based mechanisms, which could be used to meet its quantified economy-wide emission reduction target, and did not use such units in order to reach this target.

V. PROJECTIONS

The probable scenarios of greenhouse gas emissions in the Russian Federation for the period until 2030 will be primarily determined by macroeconomic situation in the country and in the world, GDP growth rate, policy and measures for development of energy, industry, transport, agriculture, waste management and other sectors of economy and by the results of implementation of specific measures for limitation and reduction of GHG emissions.

The completion of post-crisis recovery growth in 2010-2012 put the economy to the next stage of development, when the effect of most factors of pre-crisis and post-crisis growth turned out to be depleted to a large degree. The latter resulted in slowdown of the growth rate in 2013, and set out the challenges for sustainable long-term growth. The anticipated stock trends in external and world markets no longer can be the major driving force of economic growth. Structural constraints for growth relevant to improper infrastructure, obsolescent facilities, unfavorable demography and the deficiency of skilled professionals increased significantly. With this, the Russian economy will be unable to return to 2000-2008 growth path in the next 20 years. Even the maintenance of lower growth rate will require substantial reforms, which can create a positive business environment for investments, increase the importance of innovation-driven growth and develop flexible conditions for enhanced asset in the human resources. At the same time, the level of potential GDP growth can vary significantly depending on the efficiency of these reforms.

The basic scenario for deviation of the GDP in the Russian Federation in 2010-2030 was presented by the Ministry of Economic Development in October, 2013. It is given in Table V.1.

Table V.1

The GDP deviation scenario in the Russian Federation in 2010-2030

Parameter	2011-2015	2016-2020	2021-2025	2026-2030	2013-2030 (average)
GDP growth rate, per cent per year	3,1	3,1	2,5	1,8	2,5

A. Scenarios of emissions in the energy sector

As shown in Chapter II of the present report, the emissions of the greenhouse gases associated with production and consumption of fossil fuel in all sectors of economy (Energy sector) play the key role in formation of the total greenhouse gas emission in the Russian Federation. First of all this is true for CO_2 emission from combustion of solid, liquid and gas fuel and for fugitive emissions of the CH_4.

The scenarios in this chapter are based on the analysis of emission projections in the Energy sector of the Russian Federation, developed by several research groups based on

different models, activity data and assumptions.[11] It was based on 26 publications and took into consideration 71 scenarios. The scenarios considered were based on different methods of process simulation in energy and other sectors, energy efficiency increase, forecasts of production, consumption and export of energy resources and on the simulations of fuel and energy balance of the Russian Federation in the long run. The scale of necessary investments and other economic factors were also taken into consideration. The analysis took into account the evolution of predictive emission estimates published by the same groups in different years. All scenarios were arranged into 5 families, each characterized by GHG emission trends and policies and measures aimed at their reduction including the application of low-carbon technologies, improvement of energy efficiency, carbon capture and storage etc. Three families mostly eligible to the criteria of scenarios "without measures", "with measures" and "with additional measures" were selected for the Sixth National Communication of the Russian Federation.

Table V.2 represents predictive estimates of total greenhouse gas emissions in the energy sector of Russia averaged by the three families of scenarios referred to above. The range of provided estimates is restricted by the year 2030, although in some scenarios the projections were extended until 2050 and 2060.

The first family of scenarios (without measures) is guided by an assumption that the changes in energy intensity and carbon intensity of the GDP would be modified by the inertial (retrospective) pace without any acceleration of policy measures excluding those, which have been already undertaken before the development of projections.

The scenarios in the second family (with measures) assume successful implementation of planned and undertaken so far greenhouse gas mitigation and reduction efforts, which were integrated in policies and measures for modernization of the national economy, improvement of energy efficiency, reduction of environmental pollution, development of nuclear and renewable power generation and others performed in the last years. The paths of most scenarios of this family are characterized by the fact, that the inclination of trajectories is relatively close, despite the differences in initial data used by projection groups. The resulting increment of the emissions is about 160-240 Mt of CO_2-eq per decade.

The upper limit of the range of scenarios of the second family passes through a value of 2,02 billion tons CO_2-eq in 2020, almost strictly corresponding to 75 per cent of total emission in 1990 (2,03 billion tons CO_2-eq).

The scenarios of the third family (with additional measures) assume implementation of special policy and measures with the aim at reduction of the emissions of greenhouse gases such as imposition of GHG emission taxes, emission trading schemes, introduction of coal methane utilization technologies, carbon capture and storage, accelerated conversion of fuel balance in power energy industry and motor transport owing to tight emission limits etc. The value of additional in comparison with the second family scenarios emission reduction significantly depends on the degree of severity and timing of the beginning of implementation of additional measures.

[11] *The analysis was undertaken by the Center for Energy Efficiency (CENEf) in 2013.*

Table V.2

Emissions of greenhouse gases in the energy sector, billion tons CO_2-eq[1)]

		Year			
		2010[2)]	**2015**	**2020**	**2030**
Without measures					
Total emission	Range	–	2,05-2,12	2,27-2,42	2,72-3,02
	Projective estimate	1,82	2,08	2,35	2,87
	per cent to 1990	67,2	76,8	86,5	105,9
CO_2	Projective estimate	1,44	1,65	1,86	2,28
CH_4	Projective estimate	0,37	0,43	0,48	0,59
N_2O	Projective estimate	0,01	0,01	0,01	0,01
With measures					
Total emission	Range	–	1,88-1,92	1,93-2,02	2,04-2,22
	Projective estimate	1,82	1,90	1,98	2,13
	per cent to 1990	67,2	70,0	72,9	78,6
CO_2	Projective estimate	1,44	1,51	1,57	1,69
CH_4	Projective estimate	0,37	0,39	0,40	0,44
N_2O	Projective estimate	0,01	0,01	0,01	0,01
With additional measures					
Total emission	Range	–	1,82-1,84	1,82-1,86	1,82-1,89
	Projective estimate	1,82	1,83	1,84	1,86
	per cent to 1990	67,2	67,5	67,9	68,5
CO_2	Projective estimate	1,44	1,45	1,46	1,47
CH_4	Projective estimate	0,37	0,37	0,38	0,8
N_2O	Projective estimate	0,01	0,01	0,01	0,01

[1)] The sums of emissions by gases may insignificantly differ from the totals as a result of rounding
[2)] Actual emission

B. Scenarios of emissions and removals in the forest sector

The scale of forest cover disturbance affects essentially emissions and removals in the forest sector. Disturbances in the managed forests are controlled by human activity, particularly by determination of allowable cut, establishment of protected forest activities, measures for prevention and control of forest fires and pest outbreaks. This section presents the projections of carbon dioxide emissions and removals in the forest sector for the period from 2010 to 2050 under the implementation of different scenarios of forest utilization. Climatic conditions are assumed constant and corresponding to the level of 1990.

Widely known CBM-CFS3 model of the Canadian Forestry Service was used as the projection tool. The model was adapted to natural conditions and forest inventory requirements of the Russian Federation within the frames of cooperation between the Federal Forestry Agency and the Canadian Forestry Service. Projection calculations were made differentiated by the members of the Russian Federation.

Four scenarios of forest use were considered. Scenario 1 assumed retention of moderate level of forest use existent in 1992-2002 (i.e. in the period preceding the activity data obtained, which were the state forest inventory data as of January 1, 2003). According to this scenario, the moderate scale of felling and forest fires as well as the scale of reforestation will remain for the period until 2050.

Three other scenarios were developed in account with the National Strategy for Forest Sector Development until 2020, which foresees innovation scenario including the increase of wood harvest by 57 per cent by 2020 in comparison with the 2007. Forest utilization in these scenarios demonstrates linear increase (by 5,7 per cent annually) from 2010 to 2020. In case of scenario 2, this growth remains after 2020 up to achieving the estimated annual cut in 2047.

According to scenario 3, forest use in 2020 will stabilize at 157 per cent of the current level. Scenario 4 assumes maximum rate of forest use growth with achievement of the estimated annual cut in 2020. Scenarios 2-4, assume the growth of forest use and take into account restriction of the annual cut, i.e. the regulatory limit in particular members of the Russian Federation.

On retention current level of impact (scenario 1) the phytomass pool in managed forests gradually decreases removals from 430 Mt CO_2 (117 Mt C) in 2010 to 35-97 Mt CO_2 $year^{-1}$ (10-27 Mt C $year^{-1}$) in 2047-2050 (Figure V.1 A). The trend is connected with gradual increase of the age of tree stands and decrease of their capacity for carbon removal. Scenario 3 (brief moderate growth of forest use) insignificantly decreases carbon removal in phytomass of managed forests. Scenarios 2 (continuous moderate growth of forest use) and 4 (fast growth of forest use) notably decrease carbon assimilation by phytomass, and scenario 2 turns it into the source of CO_2 by 2043 with the annual emission 14-69 Mt CO_2 $year^{-1}$ (4-18 Mt C $year^{-1}$).

The projection of total removal of atmospheric carbon by all pools of managed forests is presented in Figure V.1 B. The removals decrease from 730-760 Mt CO_2 (199-207 Mt C) in 2010 to 235 Mt CO_2 (64 Mt C) in 2050 under scenario 1 and 105 Mt CO_2 (29 Mt C) under scenarios 2 and 4.

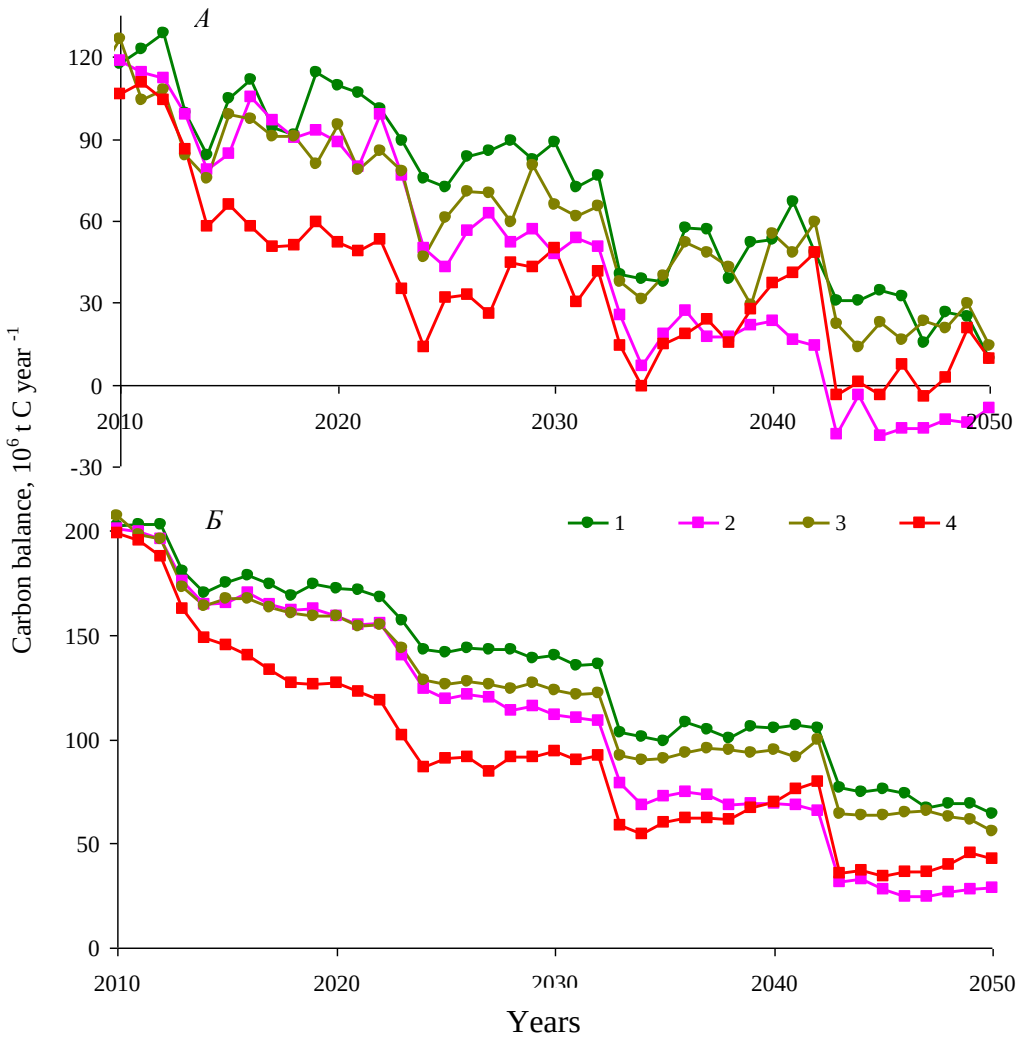

Figure V.1. Projection of carbon budget in the forests of Russian Federation in phytomass pool (A) and all pools (B) under different scenarios of forest use. Scenarios: 1 – retention of the current level, 2 – continuous moderate growth, 3 – short moderate growth, 4 – fast growth.

It should be noted that managed forests remain the CO_2 sink up to 2050 under all scenarios of forest use. The pools of dead organic matter are more conservative in response to disturbance regimes. Consequently, the period for coming to balance by these pools exceeds the considered projection period.

C. Scenarios of the total greenhouse gas emission

The data on greenhouse gas emissions in Chapter III demonstrate that the structure of cumulative emission of greenhouse gases in the Russian Federation (excluding emissions and removals in the LULUCF sector) remained relatively stable in 1990-2007 concerning the distribution of emissions by gas and by sector. Based on planned installation of modern facilities and technologies in economy and enhanced production management, it is assumed

that the GHG emission intensity in other sectors for the period till 2030 with be similar to that in the energy sector.

The scenarios of total equivalent human-induced emissions of the greenhouse gases and those for specific GHGs for the period till 2030 were developed on the basis of scenarios discussed above. The obtained emission estimates are presented in Table V.3. The emissions in table age provided excluding the contribution of the LULUCF sector.

Table V.3

Emission of greenhouse gases in Russian Federation, billion tons CO_2-equivalent[1)]

		Year			
		2010[2)]	**2015**	**2020**	**2030**
Without measures					
Total emission	Projective estimate	2,22	2,54	2,86	3,50
	per cent to 1990	66,1	75,7	85,2	104,3
CO_2	Projective estimate	1,60	1,83	2,06	2,52
CH_4	Projective estimate	0,49	0,56	0,63	0,77
N_2O	Projective estimate	0,11	0,13	0,15	0,18
F-gases	Projective estimate	0,01	0,02	0,02	0,02
With measures					
Total emission	Projective estimate	2,22	2,31	2,41	2,59
	per cent to 1990	66,1	69,0	71,8	77,4
CO_2	Projective estimate	1,60	1,67	1,73	1,87
CH_4	Projective estimate	0,49	0,51	0,53	0,57
N_2O	Projective estimate	0,11	0,12	0,12	0,13
F-gases	Projective estimate	0,01	0,01	0,02	0,02
With additional measures					
Total emission	Projective estimate	2,22	2,23	2,24	2,26
	per cent to 1990	66,1	66,5	66,9	67,4
CO_2	Projective estimate	1,60	1,61	1,62	1,63
CH_4	Projective estimate	0,49	0,49	0,50	0,50
N_2O	Projective estimate	0,11	0,11	0,12	0,12
F-gases	Projective estimate	0,01	0,01	0,01	0,01

[1)] The sums of emissions by gases may insignificantly differ from the totals as a result of rounding
[2)] Actual emission

The total emission will not exceed the 1990 level by 2020 in any of the scenarios considered. In 2030, the 1990 level will be exceeded only for scenario “without measures”.

VI. OTHER INFORMATION

As a Party not included in Annex II to the UNFCCC and in accordance with the UNFCCC Guidelines,[12] the Russian Federation does not submit in its biennial report the information on financial and technological support for capacity building in the developed country Parties.

The process of self-evaluation of the emission reduction commitments in the Russian Federation is performed through:

- The course of consideration by the Government of the Russian Federation of the drafts of annual national inventory reports on anthropogenic emissions and removals of greenhouse gases, draft national communications and draft biennial reports of the Russian Federation subject to submission in accordance with the commitments under the UNFCCC and Kyoto Protocol;
- The approval of the drafts of the above documents by the federal executive authorities.

Additional element of self-evaluation process is the consideration by the Government of the Russian Federation of the report on the realization of Integral Plan for Implementation of the Climate Doctrine of the Russian Federation for the period through 2020.[13]

Information on the progress on setting national rules for local actions against domestic non-compliance with emission reduction targets can be included in the next biennial reports, in case such rules are developed and adopted in the Russian Federation, particularly in the course of realization of the Decree of the President of the Russian Federation № 752 of September 30, 2013, "On the Reduction of the Greenhouse Gas Emissions".

[12] *The UNFCCC biennial reporting guidelines for developed country Parties (Annex I to Decision 2/CP.17 of the Conference of the Parties to the UNFCCC).*

[13] *According to the item 31 of the Integral Plan for Implementation of the Climate Doctrine of the Russian Federation for the period through 2020 approved by the Order of the Chairman of the Government of the Russian Federation on April 25, 2011, № 730-r, this report is annually submitted to the Government by the Ministry of the Natural Resources and Environment of the Russian Federation by March 15.*