

MINISTRY OF ENVIRONMENT AND WATER RESOURCES OF THE
REPUBLIC OF KAZAKHSTAN

JSC «Zhasyl Damu»

**THE FIRST BIENNIAL REPORT OF THE REPUBLIC OF
KAZAKHSTAN,**

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

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List of acronyms, abbreviations and chemical symbols

| | |
|--------|--|
| CMP | Conference of the Parties, serving as the Meeting of the Parties |
| CRF | Common Reporting Format |
| DNA | Designated National Authority |
| EB | Executive Body |
| EC | Ecological Code |
| ES | Energy saving |
| FAR | Fourth Assessment Report of the IPCC |
| FEB | Fuel and energy balance |
| FIID | Forcing industrial and innovative development |
| FR | Fuel resources |
| GDP | Gross domestic product |
| GHG | Greenhouse gases |
| GPG | Good practice guidance |
| INC | Initial National Communication |
| IPCC | Intergovernmental Panel on Climate Change |
| LP | Limited Partnership |
| KP | Kyoto Protocol |
| LULUCF | Land use, land use change and forestry |
| MEP | Ministry of environment protection |
| MEWR | Ministry of environment and water resources |
| MINT | Ministry of industry and new technologies |
| NIR | National inventory report |
| NWF | National Welfare Fund |
| PFCs | Perfluorocarbons |
| PPP | Public-private partnership |
| RES | Renewable energy sources |
| RK | Republic of Kazakhstan |
| RGRK | Resolution of the Government of the Republic of Kazakhstan |
| SAR | IPCC Second Assessment Report |
| SD | Sustainable development |
| SEC | Socio-Entrepreneurial Corporation |
| SNC | Second National Communication |
| TNC | Third National Communication |
| UNFCCC | United Nations Framework Convention on Climate Change |
| WPF | Wind power farm |
| CSD | Council for Sustainable Development |

Chemical symbols

| | |
|-----------------|---------------------|
| CFCs | Chlorofluorocarbons |
| CH ₄ | Methane |
| CO ₂ | Carbon dioxide |
| SF ₆ | Sulfur hexafluoride |

I Introduction

The Republic of Kazakhstan presents its first biennial report in accordance with decision 1/CP.16 of the Conference of the Parties of the United Nations Framework Convention on Climate Change (UNFCCC). The report consists of the Common tabular format provided by Decision 19/CP.18 in electronic format and the textual form. Common tabular format (CTF) was presented to the UNFCCC Secretariat in February 2014. The text of the report was prepared later in accordance with the «UNFCCC biennial reporting guidelines for Annex I Parties».

The First Biennial report supplements the information contained in the Third-Sixth National communications of the Republic of Kazakhstan, submitted in accordance with Articles 4 and 12 of the UNFCCC. It includes the following sections:

- introduction, which describes the national conditions and mechanisms related to the preparation of national communications on a regular basis in Kazakhstan;
- information on national inventories of anthropogenic emissions by sources and removals by sinks of all greenhouse gases (GHGs) not controlled by the Montreal Protocol, which includes the national inventory reports for the 1990-2011 and 1990-2012 years;
- quantified economy-wide emission reduction targets;
- progress in meeting quantified economy-wide emission reduction targets and related information;
- updated projections of greenhouse gas emissions by 2020 and 2030 by sector;
- other information.

Kazakhstan ratified UNFCCC in May 1995 and in August of the same year became its Party. According to the Decree of the President of Kazakhstan of March 12, 1999 the Kyoto Protocol (KP) to the UNFCCC was signed.

On March 23, 2000 the government of Kazakhstan has notified the Secretary-General of the United Nations of its intention to fulfill its obligations under paragraphs 2 a) and 2) b) in accordance with paragraph 2 g) of Article 4 of the UNFCCC.

On March 26, 2009 President Nursultan Nazarbayev signed the Law of the Republic of Kazakhstan № 144-IV “On ratification of the Kyoto Protocol to the UN Framework Convention on Climate Change.” KP officially entered into force for Kazakhstan on September 17, 2009, 90 days after the receipt of the instrument of ratification deposited with the Depositary KP - UN Secretary-General.

At the Seventh Conference of the Parties (CP7) on December 3, 2011 in Marrakesh (Morocco) the decision was made, that in accordance with paragraph 7 of Article 1 of the KP Kazakhstan is considered as Annex I Party to the UNFCCC as it submitted a notice in accordance with paragraph 2 g) of Article 4 of the Convention. Implementation of this decision was only possible after the ratification

of KP by Kazakhstan. Therefore, since 2009 the Government of Kazakhstan has begun actively working on the preparation of low-carbon development strategies and the creation of the national emissions trading system.

In 2012 at the COP18/CMP8 in Doha (Qatar), together with the amendment to the KP, it was decided to include Kazakhstan in Annex B of the KP for its second commitment period and to take the commitments to reduce GHG emissions in 2020 by 5% relatively to the level of the base year of 1990 (and by 7% during the expansion ambitions). Doha amendment sets out in Annex I to Decision 1/CMP.8 is the subject of ratification. In accordance with Articles 20 and 21 of the KP UN Secretary-General, acting as depositary of the KP, sent the amendment to all parties of the KP. In connection with the provisions set in paragraph 7-ter to Article 3 of the KP, which present certain difficulties to fulfill the obligations stated by the Republic of Kazakhstan for the second period of the KP, the Government of Kazakhstan has not yet made a decision on the ratification of the Doha amendment.

At the same time, Kazakhstan also has quantified economy-wide emission reduction targets in the amount of 15% by 2020 and 25% by 2050 from 1990 levels.

In order to fulfill its obligations under Article 12 of the UNFCCC, Kazakhstan prepared and submitted its Initial National Communication (INC) in 1998 and the Second National Communication (SNC) as a Party not included in any of the annexes of the UNFCCC in 2009.

Becoming a Party to Annex I for the purposes of the KP in 2009, Kazakhstan had to synchronize the provision of its national communications with the communications from Annex I countries. Therefore, the next National Report needed to be presented by the January 1, 2014, as the Third-Sixth National Communication. The project document of the TNC provides the following explanation about the timing of presenting of subsequent national communications of Kazakhstan:

«The term of presenting the national communication by Kazakhstan differs from the scheduled deadline for the other countries, because originally Kazakhstan was not included in Annex I to the UNFCCC. Thus, Kazakhstan prepared and submitted the SNC in 2009 for the period by 2005 (which coincides with the submission of the Fourth national communication by the countries included in Annex I). Further, in January 2010, the countries originally included in Annex I, presented the Fifth national communications for the period by 2008. This project is designed to synchronize the timing of presenting the national communication by Kazakhstan with other countries included in Annex I».

As a result, in January 2014 Kazakhstan presented the Third-Sixth National Communication for the period by 2012 in conjunction with other countries included in Annex I.

The Third-Sixth National Communication was prepared with the support of UNDP/GEF project «Enabling Activities for the Preparation of Kazakhstan's Third National Communication to the UNFCCC». Funding was provided by GEF

through National Communications Support Programme, as Kazakhstan is not included in Annex I to the UNFCCC and is therefore entitled to receive financial support. United Nations Development Program (UNDP) in Kazakhstan acted as the Executive Agency. The project started in 2010. The key experts and institutions responsible for the preparation of the previous national communications were involved to ensure a unified approach to the process of the national communication preparation. International experts with experience in specific areas of preparation of national communications were also engaged.

II Greenhouse gas emissions and trends

As a Party to Annex I for the purposes of the KP implementation the Republic of Kazakhstan has started to submit its national inventories of GHG emissions to the UNFCCC Secretariat since 2010. In total since 2010 Kazakhstan has submitted five national GHG inventories containing data from 1990 to 2008-2012, which were posted on the UNFCCC website.

All inventories undergo an annual review process by the team of international experts on review from the UNFCCC Secretariat. The review reports for the 2010-2013 can also be found on the UNFCCC website.

The national inventory of anthropogenic emissions by sources and removals by sinks of greenhouse gases not controlled by the Montreal Protocol contains National Inventory Report and spreadsheets of the common reporting format (CRF).

Summary of the National inventory submitted in 2013

The national inventory of anthropogenic emissions by sources and removals by sinks of greenhouse gases not controlled by the Montreal Protocol for the 1990-2011, submitted in 2013, contains the National Inventory Report and spreadsheets of common reporting format (CRF). In February 2014 the results of the national GHG inventory, submitted in 2013, were presented on the website of the Secretariat of the UNFCCC and placed as tables of common format (BR CTF): http://unfccc.int/national_reports/biennial_reports_and_iar/submitted_biennial_reports/items/7550.php

The National greenhouse gas inventory report (NIR) 2013 consists of 291 pages of text, including a summary, introduction, 9 chapters, conclusion, and 4 annexes. In the introductory part of the NIR the Republic of Kazakhstan on the rights of the country included in Annex I for the purposes of the KP, but not included in Annex I to the UNFCCC, substantiates the preparation of the National Inventory Report of anthropogenic GHG emissions for the 1990-2011 (submitted in 2013).

In the NIR six GHGs with direct greenhouse effect - carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs),

perfluorocarbons (PFCs) and sulfur hexafluoride (SF₆) are presented. For some categories of sources the data on indirect GHG - carbon monoxide (CO), nitrogen oxides (NO_x) and non-methane volatile organic compounds (NMVOCs) and sulfur dioxide (SO₂) - are presented.

The assessment of GHG emissions in the Republic of Kazakhstan was conducted in accordance with the Revised IPCC Guidelines for National GHG Inventories 1996 (IPCC, 1996) and the IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories (IPCC, 2000). GHG Inventory in the sector "Land use, land use change and forestry" (LULUCF) was carried out in accordance with the Guidelines on good practice guidance for LULUCF (IPCC, 2003).

This inventory was prepared in accordance with decision 18/CP.8 and 14/CP.11 of the UNFCCC, as described in the Guidelines for the preparation of national communications by Parties included in Annex I to the UNFCCC, Part I: UNFCCC guidelines for reporting annual inventories (FCCC/SBSTA/2006/9).

Kazakhstan's CRF tables do not include the reporting of activities under paragraphs 3.3 and 3.4. of the KP in accordance with decision 14/CP.11 and 6/CMP.3, as Kazakhstan was not included in Annex B and had no quantitative commitments for the first commitment period of the KP.

In this connection it is not required to submit the report, including estimates of GHG emissions and removals from the LULUCF sector taking into account the requirements of the Decision 6/CMP.3 «Guidance on good practice for land use, land-use change and forestry (LULUCF)» in accordance with paragraphs 3 and 4 of Article 3 of the KP.

Summary of the NIR includes two sections that describe the sources of GHG in the Republic of Kazakhstan and their dynamics, as well as the overall rate and time trends for the period from 1990 to 2011.

Section 1 consists of seven subsections that in general comply with the guidelines of the UNFCCC, with the exception of the last subsection, which has to include an assessment of the completeness of the inventory:

- Background information on climate change;
- National greenhouse gas inventory system;
- Inventory preparation process;
- Description of the methodologies and data sources used;
- Brief description of the analysis of key sources;
- Quality assurance and quality control;
- Uncertainty assessment.

In this section it is stated that climate change is recognized as one of the major global environmental issues in Kazakhstan, as reflected in the Strategic Plan of the Ministry of Environment Protection. In Kazakhstan GHG emissions in 2011 amounted to more than 16.7 tons per capita, 13 tons of which accounted for CO₂.

Since 2000 GHG inventory has been annually developed by Republican State Enterprise "The Kazakh Scientific and Research Institute of Environment and Climate"(KazNIIK) (now reorganized into JSC «Zhasyl Damu») on the

request of the Ministry of Environment of Kazakhstan, which according to the relevant Government Decree is the Designated National Authority (DNA) for the coordination of the implementation of the Kyoto Protocol to the UNFCCC and for GHG inventory.

In accordance with Article 12, para.1 (a) of the UNFCCC, the Kazakh inventory, or the National inventory of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, includes information on the following greenhouse gases: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulfur hexafluoride (SF₆).

The preparation of national GHG inventories is being conducted on a regular basis since 2000 and is financed from the state budget. Prior to the ratification of the KP, this work was carried out within the research program of the Ministry of Environment Protection. After KP ratification in 2009 a budget program was adopted, which is funded from the state budget and includes a component that is associated with the preparation of annual national GHG inventories.

Regulatory framework of the national system is the Resolution «On approval of the Rules on management and maintenance of the state cadaster of GHG emissions and removals», specifically adopted by the Government of Kazakhstan. These Rules are developed in accordance with paragraph 3 of Article 158-1 of the Environmental Code of the Republic of Kazakhstan dated January 9, 2007 with amendments as of 03.12.2011. The Rules set up the procedures for management and maintenance of the state cadaster of GHG emissions and removals. They are approved by the Resolution № 943 of the Government of the Republic of Kazakhstan dated July 17, 2012. The authorized body in the field of environmental protection organizes the development and maintenance of the state cadaster.

Kazakhstan inventory follows the provisions of the IPCC methodology for calculating emissions, assessment of uncertainties and analysis of key sources. To select the appropriate methodology for each sector/category «decision tree» is used, which is based on an analysis of key emission sources, which add up to 95% to total national emissions in the country in a given year. Each year sources of GHG emissions are updated in order to avoid underestimation of emissions from any activities that appeared in the year of the inventory or to take into account the introduction of new technologies. Thus, all the sources in Kazakhstan are taken into account in the inventory in the presence of the methodology and emission factors to estimate emissions from these sources.

Section 2 - Trends in GHG emissions, including national totals by gas, by source category, comprises a review of the main results of the GHG inventory. Sources of GHG emissions in Kazakhstan, according to the IPCC categories are the following: *Energy activities, industrial processes, agriculture, land use, land use change and forestry (LULUCF) and waste.*

Table 1 shows the GHG emissions in Kazakhstan by sectors - the sources of GHG emissions for the period of 1990-2011.

Table 1 - GHG emissions in Kazakhstan by sectors, mln. tons CO₂ eq.

| Sector | 1990 | 1995 | 2000 | 2005 | 2008 | 2009 | 2010 | 2011 | Change in the last reporting year, compared to the base year, % |
|--|--------|--------|--------|--------|--------|--------|--------|--------|---|
| Energy activities | 299.58 | 180.55 | 144.11 | 190.45 | 198.08 | 222.22 | 244.61 | 231.80 | -22.62 |
| Industrial processes | 17.92 | 8.14 | 10.23 | 13.26 | 14.38 | 13.60 | 15.11 | 17.16 | -4.23 |
| Agriculture | 38.14 | 23.12 | 14.53 | 19.09 | 21.26 | 21.99 | 22.30 | 21.43 | -43.81 |
| Land use, land use change and forestry (net absorption) | -2.17 | -7.29 | -10.12 | -2.86 | -2.47 | -2.48 | -2.89 | -3.09 | 42.79 |
| Waste | 2.74 | 3.11 | 3.09 | 3.47 | 3.74 | 3.84 | 3.95 | 4.07 | 48.37 |
| Total (including LULUCF) | 356.21 | 207.63 | 161.85 | 223.41 | 235.00 | 259.17 | 283.08 | 271.37 | -23.82 |
| Total (excluding LULUCF) | 358.38 | 214.92 | 171.96 | 226.27 | 237.47 | 261.65 | 285.97 | 274.46 | -23.42 |

Total national greenhouse gas emissions in CO₂ equivalent without LULUCF in 2011 reached 274.46 million tons of CO₂-eq. and decreased compared to the base 1990, in which they were 358.38 million tons of CO₂-eq., by 83.49 million tons of CO₂-eq., or 23.30%. They consist of 231.8 million tons of CO₂-eq. from *Energy activities*, 17.16 mln. tons - from *Industrial processes*, 21.43 mln tons from *Agriculture* and 4.07 million tons from *Waste*. Absorption in the *LULUCF* sector amounted to 3.09 million tons of CO₂. Total emissions in 2011 taking into account the absorption of CO₂ from *LULUCF* are estimated at 271.37 million tons of CO₂-eq.

In 2011 the largest contribution to the total national GHG emissions in Kazakhstan is from *Energy activities* (231.8 million tons of CO₂-eq.). The next sector in terms of emissions is *Agriculture* (21.43 million tons of CO₂-eq.). However, GHG emissions from this sector are below 1990 levels by almost 43,8% and lower than emissions in 2010 by 4%. Emissions reduction in 2011 compared to 1990 is due to a sharp decrease in the number of livestock, and increase in 2011 compared to 2010 is due to its slight increase. In the *Industrial processes* sector GHG emissions of 17.2 million tons of CO₂ eq. also did not reach the level of the base 1990 (3.9% below the 1990 level). The share of emissions from the *waste* sector in the total national net emissions excluding LULUCF absorption amounted to 1.47% in 2011. In the sector of LULUCF carbon absorption from forest lands in Kazakhstan for the period 1990-2011 increased, which can be explained by the growth of timber reserves in young forests.

Tables 2 and 3 show a set of data on national GHG emissions presented in the tables of the Common Reporting Format of Inventory 2013.

Table 2 - Summary of the national report on greenhouse gas inventory in Kazakhstan in 2011 according to the spreadsheets of CRF inventory submitted in 2013

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS

Inventory 2011

(Sheet 1 of 1)

Submission 2013 v1.4

| GREENHOUSE GAS SOURCE AND SINK CATEGORIES | CO ₂ ⁽¹⁾ | CH ₄ | N ₂ O | HFCs ⁽²⁾ | PFCs ⁽²⁾ | SF ₆ ⁽²⁾ | Total |
|--|---------------------------------|------------------|------------------|---------------------|---------------------|--------------------------------|-------------------|
| | CO ₂ equivalent (Gg) | | | | | | |
| Total (Net Emissions)⁽¹⁾ | 211 622,79 | 48 635,19 | 8 936,96 | 843,56 | 1 328,41 | NA,NO | 271 366,91 |
| 1. Energy | 199 754,18 | 31 374,31 | 674,12 | | | | 231 802,61 |
| A. Fuel Combustion (Sectoral Approach) | 197 166,29 | 849,00 | 674,12 | | | | 198 689,41 |
| 1. Energy Industries | 93 657,17 | 26,88 | 369,22 | | | | 94 053,28 |
| 2. Manufacturing Industries and Construction | 26 292,54 | 47,39 | 108,32 | | | | 26 448,25 |
| 3. Transport | 19 910,39 | 121,81 | 32,91 | | | | 20 065,11 |
| 4. Other Sectors | 16 795,38 | 581,21 | 62,65 | | | | 17 439,23 |
| 5. Other | 40 510,80 | 71,72 | 101,02 | | | | 40 683,55 |
| B. Fugitive Emissions from Fuels | 2 587,89 | 30 525,30 | NA,NE,NO | | | | 33 113,20 |
| 1. Solid Fuels | 181,17 | 22 735,45 | NA,NO | | | | 22 916,62 |
| 2. Oil and Natural Gas | 2 406,73 | 7 789,85 | NA,NE,NO | | | | 10 196,58 |
| 2. Industrial Processes | 14 959,73 | 27,96 | NA,NO | 843,56 | 1 328,41 | NA,NO | 17 159,66 |
| A. Mineral Products | 5 360,16 | NO | NO | | | | 5 360,16 |
| B. Chemical Industry | 273,53 | 27,96 | NA,NO | NA | NA | NA | 301,49 |
| C. Metal Production | 9 326,04 | IE,NA,NO | NA | NA | 1 328,41 | NA,NO | 10 654,45 |
| D. Other Production | NE | | | | | | NE |
| E. Production of Halocarbons and SF ₆ | | | | NA,NO | NA | NA | NA,NO |
| F. Consumption of Halocarbons and SF ₆ ⁽²⁾ | | | | 843,56 | NA,NO | NA,NO | 843,56 |
| G. Other | NA | NA | NA | NA | NA | NA | NA |
| 3. Solvent and Other Product Use | NA,NE | | NA,NE | | | | NA,NE |
| 4. Agriculture | | 13 659,67 | 7 773,02 | | | | 21 432,69 |
| A. Enteric Fermentation | | 12 668,89 | | | | | 12 668,89 |
| B. Manure Management | | 873,60 | 3 256,10 | | | | 4 129,70 |
| C. Rice Cultivation | | 117,18 | | | | | 117,18 |
| D. Agricultural Soils ⁽³⁾ | | NA,NE | 4 516,92 | | | | 4 516,92 |
| E. Prescribed Burning of Savannas | | NA | NA | | | | NA |
| F. Field Burning of Agricultural Residues | | NA,NO | NA,NO | | | | NA,NO |
| G. Other | | NA | NA | | | | NA |

| | | | | | | | |
|--|------------------|-----------------|---------------|-----------|-----------|-----------|------------------|
| 5. Land Use, Land-Use Change and Forestry⁽¹⁾ | -3 094,67 | 0,82 | 0,24 | | | | -3 093,61 |
| A. Forest Land | -3 215,67 | 0,82 | 0,24 | | | | -3 214,61 |
| B. Cropland | NE,NO | NO | NE,NO | | | | NE,NO |
| C. Grassland | 121,00 | NE,NO | NE,NO | | | | 121,00 |
| D. Wetlands | NE,NO | NO | NO | | | | NE,NO |
| E. Settlements | NE,NO | NE,NO | NE,NO | | | | NE,NO |
| F. Other Land | NO | NO | NO | | | | NO |
| G. Other | NA | NE | NE | | | | NA,NE |
| 6. Waste | 3,55 | 3 572,44 | 489,57 | | | | 4 065,56 |
| A. Solid Waste Disposal on Land | NA,NO | 3 572,44 | | | | | 3 572,44 |
| B. Waste-water Handling | | NA,NO | 489,57 | | | | 489,57 |
| C. Waste Incineration | 3,55 | NO | NO | | | | 3,55 |
| D. Other | NA | NA | NA | | | | NA |
| 7. Other (as specified in Summary I.A) | NA | NA | NA | NA | NA | NA | NA |

| | | | | | | | |
|--|---------------|-----------|-----------|--|--|--|---------------|
| Memo Items: ⁽⁴⁾ | | | | | | | |
| International Bunkers | 397,95 | 0,02 | 4,08 | | | | 402,05 |
| Aviation | 397,95 | 0,02 | 4,08 | | | | 402,05 |
| Marine | NA,NE | NA,NE | NA,NE | | | | NA,NE |
| Multilateral Operations | NO | NO | NO | | | | NO |
| CO₂ Emissions from Biomass | 495,34 | | | | | | 495,34 |

| | | | | | | | |
|---|--|--|--|--|--|--|------------|
| Total CO ₂ Equivalent Emissions without Land Use, Land-Use Change and Forestry | | | | | | | 274 460,52 |
| Total CO ₂ Equivalent Emissions with Land Use, Land-Use Change and Forestry | | | | | | | 271 366,91 |

| | | | | | | | |
|--|------------------|-------------|-------------|--|--|--|------------------|
| 5. Land Use, Land-Use Change and Forestry⁽¹⁾ | -3 094,67 | 0,82 | 0,24 | | | | -3 093,61 |
| A. Forest Land | -3 215,67 | 0,82 | 0,24 | | | | -3 214,61 |
| B. Cropland | NE,NO | NO | NE,NO | | | | NE,NO |
| C. Grassland | 121,00 | NE,NO | NE,NO | | | | 121,00 |
| D. Wetlands | NE,NO | NO | NO | | | | NE,NO |
| E. Settlements | NE,NO | NE,NO | NE,NO | | | | NE,NO |
| F. Other Land | NO | NO | NO | | | | NO |
| G. Other | NA | NE | NE | | | | NA,NE |

| | | | | | | | |
|---|-------------|-----------------|---------------|-----------|-----------|-----------|-----------------|
| 6. Waste | 3,55 | 3 572,44 | 489,57 | | | | 4 065,56 |
| A. Solid Waste Disposal on Land | NA,NO | 3 572,44 | | | | | 3 572,44 |
| B. Waste-water Handling | | NA,NO | 489,57 | | | | 489,57 |
| C. Waste Incineration | 3,55 | NO | NO | | | | 3,55 |
| D. Other | NA | NA | NA | | | | NA |
| 7. Other (as specified in Summary I.A) | NA | NA | NA | NA | NA | NA | NA |

| | | | | | | | |
|--|---------------|-----------|-----------|--|--|--|---------------|
| Memo Items: ⁽⁴⁾ | | | | | | | |
| International Bunkers | 397,95 | 0,02 | 4,08 | | | | 402,05 |
| Aviation | 397,95 | 0,02 | 4,08 | | | | 402,05 |
| Marine | NA,NE | NA,NE | NA,NE | | | | NA,NE |
| Multilateral Operations | NO | NO | NO | | | | NO |
| CO₂ Emissions from Biomass | 495,34 | | | | | | 495,34 |

| | |
|---|------------|
| Total CO ₂ Equivalent Emissions without Land Use, Land-Use Change and Forestry | 274 460,52 |
| Total CO ₂ Equivalent Emissions with Land Use, Land-Use Change and Forestry | 271 366,91 |

- 1) CO₂ emissions in Land Use, Land Change and Forestry (LULUCF) sector should include pure emissions and absorption. Absorption considered as negative quantity (-) and emissions as positive (+).
- 2) Factual emissions should be included in aggregate national emissions. If factual emissions are absent then potential emissions are included.
- 3) Parties, which previously included CO₂ emissions, from soil in sector *Land Use* should indicate it in the text of the national report.
- 4) Parties should report on emissions from international aviation and sea bunker fuel, from multiple operations, and also on CO₂ emissions from biomass for informative purposes. These emissions are not included in aggregated national emissions, as it is considered that biomass is constantly reproduces. These emissions also should not be included in aggregated national emissions from power sector. Biomass, used as fuel, is included in aggregated national consumption of fuel, but corresponding CO₂ emissions are not included in aggregated national summary emissions as it is considered that wooden biomass is constantly reproduces. If biomass is produced on a constant level, then net emissions of CO₂ emissions are included in losses of accumulated biomass in the LULUCF sector.

Table 3 - Aggregate data of national report on Greenhouse gas inventory in Kazakhstan for 2011, based on data from electronic tables of inventory's CRF presented in 2013.

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS

(Sheet 1 of 1)

Inventory 1990

Submission 2013 v1.4

KAZAKHSTAN

| GREENHOUSE GAS SOURCE AND SINK CATEGORIES | CO ₂ ⁽¹⁾ | CH ₄ | N ₂ O | HFCs ₍₂₎ | PFCs ₍₂₎ | SF ₆ ⁽²⁾ | Total |
|--|---------------------------------|------------------|------------------|---------------------|---------------------|--------------------------------|-------------------|
| | CO ₂ equivalent (Gg) | | | | | | |
| Total (Net Emissions)⁽¹⁾ | 266 563,18 | 73 328,12 | 16 319,82 | NA,NO | NA,NO | NA,NO | 356 211,11 |
| 1. Energy | 250 860,74 | 47 844,31 | 871,07 | | | | 299 576,11 |
| A. Fuel Combustion (Sectoral Approach) | 244 844,47 | 1 299,29 | 871,07 | | | | 247 014,82 |
| 1. Energy Industries | 113 513,36 | 39,33 | 434,25 | | | | 113 986,95 |
| 2. Manufacturing Industries and Construction | 21 891,41 | 33,09 | 63,75 | | | | 21 988,24 |
| 3. Transport | 22 490,91 | 125,55 | 35,04 | | | | 22 651,50 |
| 4. Other Sectors | 51 747,99 | 1 036,62 | 211,21 | | | | 52 995,82 |
| 5. Other | 35 200,80 | 64,70 | 126,82 | | | | 35 392,31 |
| B. Fugitive Emissions from Fuels | 6 016,27 | 46 545,03 | NA,NE,NO | | | | 52 561,29 |
| 1. Solid Fuels | 169,06 | 37 431,26 | NA,NO | | | | 37 600,33 |
| 2. Oil and Natural Gas | 5 847,20 | 9 113,76 | NA,NE,NO | | | | 14 960,97 |
| 2. Industrial Processes | 17 869,44 | 47,39 | NA,NO | NA,NO | NA,NO | NA,NO | 17 916,83 |
| A. Mineral Products | 5 955,81 | NO | NO | | | | 5 955,81 |
| B. Chemical Industry | 1 588,67 | 47,39 | NA,NO | NA | NA | NA | 1 636,05 |
| C. Metal Production | 10 324,96 | IE,NA,NE,NO | NA | NA | NA,NO | NA,NO | 10 324,96 |
| D. Other Production | NE | | | | | | NE |
| E. Production of Halocarbons and SF ₆ | | | | NA,NO | NA | NA | NA,NO |
| F. Consumption of Halocarbons and SF ₆ ⁽²⁾ | | | | NA,NO | NA,NO | NA,NO | NA,NO |
| G. Other | NA | NA | NA | NA | NA | NA | NA |
| 3. Solvent and Other Product Use | NA,NE | | NA,NE | | | | NA,NE |
| 4. Agriculture | | 23 084,48 | 15 060,03 | | | | 38 144,51 |
| A. Enteric Fermentation | | 21 372,36 | | | | | 21 372,36 |
| B. Manure Management | | 1 555,87 | 5 678,23 | | | | 7 234,10 |
| C. Rice Cultivation | | 156,24 | | | | | 156,24 |
| D. Agricultural Soils ⁽³⁾ | | NA,NE | 9 381,81 | | | | 9 381,81 |
| E. Prescribed Burning of Savannas | | NA | NA | | | | NA |

| | | | | | | | |
|--|------------------|-----------------|---------------|-----------|-----------|-----------|------------------|
| F. Field Burning of Agricultural Residues | | NA,NO | NA,NO | | | | NA,NO |
| G. Other | | NA | NA | | | | NA |
| 5. Land Use, Land-Use Change and Forestry⁽¹⁾ | -2 167,00 | 0,35 | 0,10 | | | | -2 166,55 |
| A. Forest Land | -1 774,67 | 0,35 | 0,10 | | | | -1 774,22 |
| B. Cropland | -11,00 | NO | NE,NO | | | | -11,00 |
| C. Grassland | -381,33 | NE,NO | NE,NO | | | | -381,33 |
| D. Wetlands | NE,NO | NO | NO | | | | NE,NO |
| E. Settlements | NE,NO | NE,NO | NE,NO | | | | NE,NO |
| F. Other Land | NO | NE,NO | NE,NO | | | | NE,NO |
| G. Other | NA | NE | NE | | | | NA,NE |
| 6. Waste | NA,NO | 2 351,60 | 388,62 | | | | 2 740,21 |
| A. Solid Waste Disposal on Land | NA,NO | 2 351,60 | | | | | 2 351,60 |
| B. Waste-water Handling | | NA,NO | 388,62 | | | | 388,62 |
| C. Waste Incineration | NO | NO | NO | | | | NO |
| D. Other | NA | NA | NA | | | | NA |
| 7. Other (as specified in Summary I.A) | NA | NA | NA | NA | NA | NA | NA |
| Memo Items:⁽⁴⁾ | | | | | | | |
| International Bunkers | NA,NE | NA,NE | NA,NE | | | | NA,NE |
| Aviation | NE | NE | NE | | | | NE |
| Marine | NA,NE | NA,NE | NA,NE | | | | NA,NE |
| Multilateral Operations | NO | NO | NO | | | | NO |
| CO₂ Emissions from Biomass | 1 083,33 | | | | | | 1 083,33 |

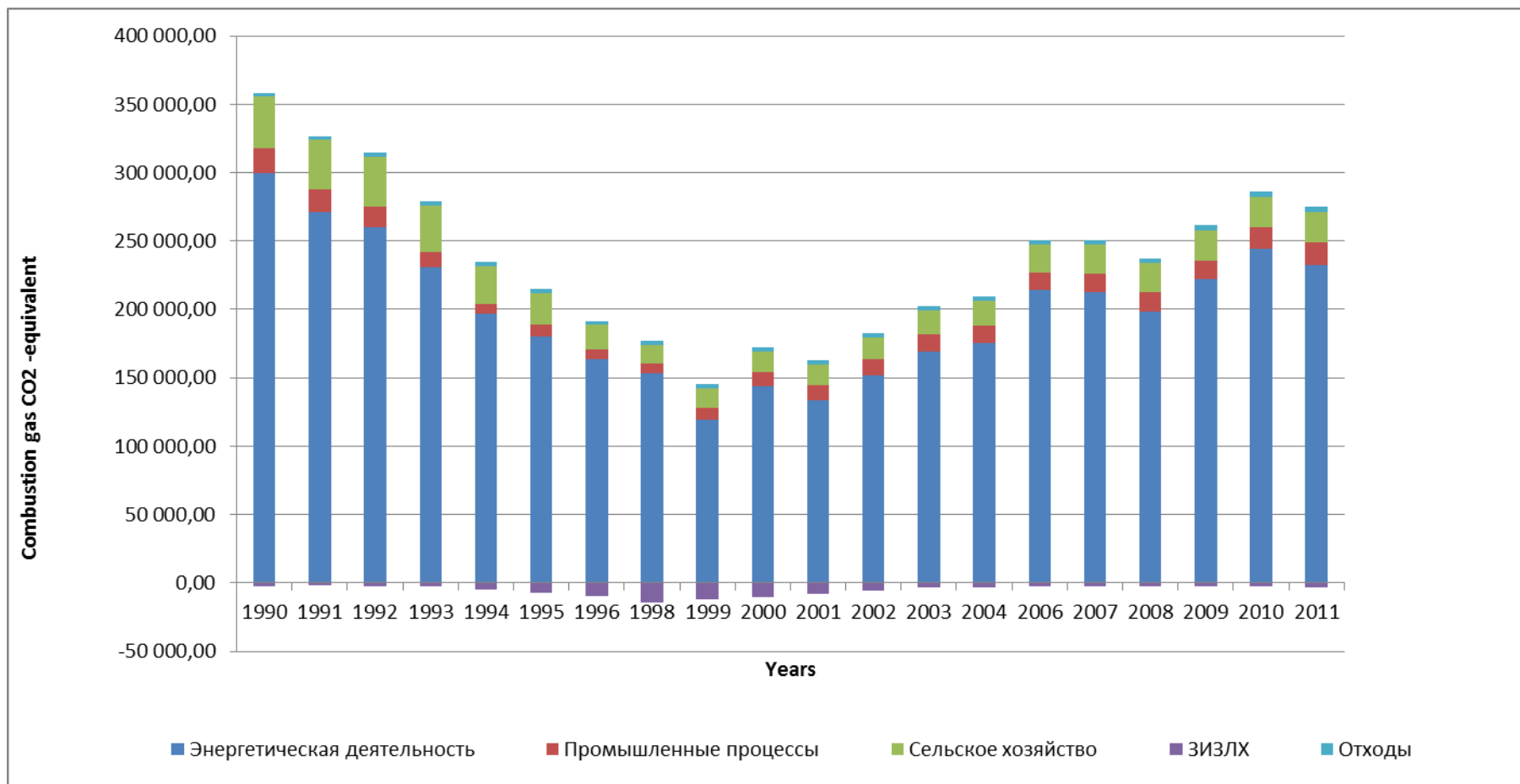
| | |
|---|------------|
| Total CO ₂ Equivalent Emissions without Land Use, Land-Use Change and Forestry | 358 377,66 |
| Total CO ₂ Equivalent Emissions with Land Use, Land-Use Change and Forestry | 356 211,11 |

1) CO₂ emissions in Land Use, Land Change and Forestry (LULUCF) sector should include pure emissions and absorption. Absorption considered as negative quantity (-) and emissions as positive (+).

2) Factual emissions should be included in aggregate national emissions. If factual emissions are absent then potential emissions are included.

3) Parties, which previously included CO₂ emissions, from soil in sector *Land Use* should indicate it in the text of the national report.

4) Parties should report on emissions from international aviation and sea bunker fuel, from multiple operations, and also on CO₂ emissions from biomass for informative purposes. These emissions are not included in aggregated national emissions, as it is considered that biomass is constantly reproduces. These emissions also should not be included in aggregated national emissions from power sector. Biomass, used as fuel, is included in aggregated national consumption of fuel, but corresponding CO₂ emissions are not included in aggregated national summary emissions as it is considered that wooden biomass is constantly reproduces. If biomass is produced on a constant level, then net emissions of CO₂ emissions are included in losses of accumulated biomass in the LULUCF sector.



Picture 1 - Dynamics of greenhouse gas emissions in Republic of Kazakhstan for 1990-2011.
 Blue – Power activity, Red – Industrial processes, Green – Agriculture, Purple – LULUCF, Pale blue – Waste

Section 3 Aggregate review of greenhouse gas emissions in sector "Power activity" in the Republic of Kazakhstan for the period 1990-2011 (Sector 1 of common reporting format) presents the results of review on GHG emissions on basic and sector methods and by separate categories. In 2011 emissions from this sector comprised 231.80 mln.t CO₂ –eq., or about 85.4 % of total GHG emissions, excluding absorptions in LULUCF sector. In 2011 cumulative emissions in category "Power activity" reduced by 22.48% comparing to 1990, and reduced by 5.1% compared to 2010. More than half of emissions during fuel combustion are formed during the production of heat and electricity (in power industry or energy). The category "Fugitive emissions" produces 33.11 mln.t.CO₂-equivalent, where emissions from mining, conversion and transportation of coal consist of more than 22.92 mln.t CO₂-equivalent. In oil and gas sector, fugitive emissions become considerably lower – only 10.20 mln. t. CO₂-eq. They include not only leakage during mining, storage and transportation of oil and gas, but also emissions which form during non-productive annealing of associated gas of oil extraction.

Section 4 Industrial Processes (CRF, sector 2) presents the results of GHG inventory in the sector, including the three major categories: production of mineral products, metals and chemicals, as well as the use of fluorinated gases (PFCs, HFCs and SF₆). In the industrial processes sector in 2011, GHG emissions were still below the base year and accounted for 17.16 million tons of CO₂-eq., which is 4.2 % below the 1990 level. The main sources of emissions in this sector is the production of metals (iron and steel) and aluminum, which increased emissions relative to 2007, when Kazakhstan produced the first tone of aluminum, almost 19 times and amounted to 1.79 million tons of CO₂ eq.

Section 5 Use of solvents and other products (CRF, sector 3) provides a short overview of the sector. Due to the lack of sufficient data for the calculation of the initial data, performance assessment of emissions for the period 1990-2011 failed. Efforts are being made to fill this gap in the national inventory. Preliminary assessment of the limited available materials in recent years has shown that emissions from this sector are insignificant.

Section 6 Agriculture (CRF, sector 4) provides an overview of the activities of the sector, including the cultivation of crops and the additional input of nitrogen into the soil, including the cultivation of rice and methane emissions, as well as activities in livestock, CH₄ emissions from enteric fermentation of agricultural animals, cleaning, storage and use of manure and agricultural land. GHG emissions from this sector amounted to 21.43 million tons of CO₂-eq. in 2011, which is below the 1990 level by almost 43.8% and lower than emissions in 2010 by 4%. Enteric fermentation is the main source of GHG emissions in this sector; it constitutes 59% of the total emissions of the sector. Livestock contributes from 41 to 55% of GDP in the agricultural sector and to a lesser extent compared to the crop, influenced by weather conditions and fluctuations in prices for agricultural products in the world market. Reduction of GHG emissions in 2011 compared to the base year due to a significant reduction in livestock, and a slight increase

compared with the previous year due to the increase in the number of farm animals.

Section 7, *Land use, land-use change and forestry (LULUCF) (CRF, Sector 5)* assesses the GHG emissions and removals of CO₂ from natural pastures and grasslands, arable land and forests. The maximum areas of planted young trees were in the period 1990-1995 and according to the Kazakh forest management enterprises, made up to 509 thousand ha. (1991). These young forests, reaching in the second half of the 90s the threshold of maturity, provided the main growth of wood on forest land until 2011. In the last years of this century, the area of young forests decreased and was only 43.6 - 83.3 thousand ha. The total absorption in the LULUCF sector in 2011 was 3.09 mln. tons of CO₂ and increased relative to 1990 by 42.78%.

Section 8 *Waste (CRF, sector 6)* shows GHG emissions from landfills (category 6.A.CRF), when processing sewage (category 6.B.CRF), emissions from human activities and products from waste incineration (category 6. C. CRF). Calculations of methane emissions from disposal of solid waste in the last inventory held for the first time on the Tier 2 (first-order decay model) separately for controlled landfills in Almaty and Astana, and unmanaged landfills (for other cities). Increase in the total GHG emissions from the waste sector, mainly occurs in the sub-categories of solid waste from managed landfills in Almaty and Astana due to population growth. The largest contribution to the total emission of the sector "Waste" make landfills - from 80 to 85% in all years of inventory and subcategories - unmanaged landfills - from 65 to 68%.

The share of the contribution of methane emissions from the waste sector in 1990 was 86%, and in 2010 increased to 88%. The contribution of nitrous oxide emissions from wastewater of human life as a result of protein intake in the total emissions from the sector "Waste" varies from 10 to 15% for the entire period, and reached 14% in the base year 1990, and in 2011 - 12%. Combustion of medical wastes is a small source and makes less than 0.1% of the total emissions in the sector.

Section 9 *recalculations and improvements* provided information on recalculations of emissions from certain source categories as a result of the transition to higher levels of calculation methodology taking into account requirements of process of consideration and the planned improvements of inventories.

Appropriate recalculations of GHG estimates were made in some categories in all five sectors. In 2010, as a result of recalculations total national emissions including LULUCF increased by 26 391.74 Gg CO₂-eq. or 10.28%, and without LULUCF 23 249.41 Gg CO₂-eq. or 8.85%.

In the sector of Energy values of GHG emissions for some categories have been restated. A time row was adjusted in basic approach under the article "Fuel export": basic data of FEB (fuel and energy balance) on export are entered. Before the last inventory the article "released to the enterprises and the organizations" was entered in the article "export". Mainly for this reason emissions of GHG for all

years in the energy sector grew. On sector approach correction of temporary ranks was carried out: in a subcategory "Production and distillation of oil" in 2000 consumption of crude oil is modified (2264.9 thousand tons are changed to 2.264 thousand tons) as probably in basic data of FEB there was a mistake owing to the wrong transfer from tons to one thousand tons. Such considerable consumption of crude oil (2264.9 thousand tons) in this subcategory does not correspond to other temporary row.

Due to the fact that in the fuel and energy balance of 2010 there was no data on natural gas consumption in the category "Steam and hot water", they managed to recover it by interpolation using the volume index as a percentage of the previous year. As a result, the increase in emissions in this sub-category was 4.9% in 2010 compared to 2009. In the category "Transport" it was succeeded to specify fuel balance and to make recalculations of GHG emissions. Therefore in base 1990 year the assessment on this category increased by 2%, and the contribution of these changes to the total national emissions was only 0.12%.

Recalculations were made in the category "Mineral products" from calcium carbide in response to a comment by the expert review of national inventory submitted in 2012, that the calculations took into account only the production, but did not include consumption. In the category "Metal production" performance of the calculations led to the clarification of estimates of CO₂ emissions. As a result, CO₂ emissions from this source in 2010 increased by 1.19%.

On agricultural sector in the category of "Enteric fermentation" additional subcategories were taken into account, such animals as "donkeys" and "buffalo" and the category of "small cattle" was divided into two sub-categories - "sheep" and "goats." Missing data for 2011 and 1990 were obtained by extrapolation based on available data for the years to come. In the category of "removal, storage and use of manure" data was clarified for storage and use of manure and recalculation made for the entire period from 1990 to 2010.

Recalculations were made in the category of "solid waste landfill", in which the Tier 2 methodology (first order decay - FOD model) for the first time was used. Calculations of emission of methane are carried out separately for the large cities of Astana and Almaty where solid waste landfills are considered as the operated. Emissions of methane for other cities also calculated from dumps of solid waste separately and were considered as uncontrolled. As a result of use of methodology of higher order emissions in this sector decreased. In 2010 emissions of methane from this category decreased by 12.88% that led to decrease in the general national emissions by only 0.18%. In 1990 these reductions made 35% and 0.36%, respectively. Recalculations also concerned emission of methane from sewage which since 2011 is not calculated as the applied aerobic technology of their cleaning in Kazakhstan does not lead to essential formation of methane. It is planned to consider remarks of experts on the review in the following inventory according to which it is considered in the European countries, that even at aerobic methods of cleaning nevertheless about 10% of sewage are processed in anaerobic

conditions under which methane is formed and it should be considered in national emissions.

The *final part* of the National Inventory Report summarizes the GHG inventory for the year 2011, in which the level of emissions still did not reach the base year, remaining by 23.8% below the given absorption in the LULUCF sector, and without CO₂ sequestration by forests - below 23.4%. The positive dynamics of GHG observed only in the waste sector, in which the increase in emissions in 1990 was 48.4%. Also, the total absorption of CO₂ by forests, compared to the base year, in 2011 increased by 29.96% due to the growth of wood biomass. In the rest of the fiscal year GHG emissions decreased by 22.6% in power activities, by 43.8% in agriculture and by 4.2% in industrial processes from the base year level.

In national anthropogenic GHG emissions during the reporting year, including the LULUCF sector, CO₂ emissions amounted to 211.62 mln. tons, CH₄ emissions are in the second place (48.63 million. tons CO₂-eq.), emissions of N₂O are significantly lower, or 8.94 million t CO₂-eq. Emissions of HFCs and PFCs comprise only 0.84 and 1.33 million tons CO₂-eq., respectively, and SF₆ emissions in 2011 were not produced.

Total national GHG emissions excluding LULUCF absorption in 2011 amounted to 76.6% of the level of emissions in 1990 and compared to 2010 decreased by 3.9%.

Energy sector contributes most to the total national GHG emissions in Kazakhstan in all years. In 2011, emissions from it amounted to 231.80 mln tons of CO₂ -equivalent or about 84.3% of total GHG emissions (excluding LULUCF absorption). Emissions in this sector are made up of two categories - "Fuel Combustion" (198.69 million tons) and "Fugitive emissions" (33.11 million tons), that is the percentage contribution of 85.7% and 14.3%, respectively. In this case, the total emissions from the "Power" decreased by 21.6% compared to 1990 and decreased by 4.9% compared to 2010.

More than half of the emissions from fuel combustion were generated in the production of heat and electricity. In the category "Fugitive emissions" 33.11 mln. tons of CO₂-eq. make much of the production, processing and transportation of coal (22,920. t CO₂-eq.), or nearly 70%. From the oil and gas sector comes 10.20 mln. tons of CO₂-eq. or 30% of volatile emissions. These emissions include not only leaks during production, storage and transport of oil and gas, but also emissions from flaring of associated gas.

GHG emissions in the second largest sector (agriculture) amounted to 21.43. t CO₂-eq. in 2011, which is below the 1990 level by 43.8%, and lower than emissions in 2010 by 4%. The main source of GHG emissions in this sector is enteric fermentation of agricultural animals, which makes 59% of total emissions from this sector. In 2011, the grazing lands of ranging (cattle grazing) emit 8.97 ths. tons of nitrous oxide, which is less than 4%, compared with 2010, and twice less than in 1990. Nitrous oxide emissions from the soil of cultivated land (arable and pasture), without taking into account the release of nitrogen in the process of mineralization of organic matter, were 4.52 million tons of CO₂-eq.

In the industrial processes sector in 2011, GHG emissions are still below the base year by 4.2%.

Total greenhouse gas emissions from the waste sector in 2011 comprised 4.07 million tons of CO₂-eq., which is 2.73% higher than in previous 2010. Compared with 1990 base year emissions in 2011 in this sector grew by almost 1.5 times or 48.41%, mainly due to the increase of solid waste generation due to urban population growth. The share of the contribution of emissions from the waste sector in the total national net emissions excluding LULUCF absorption amounted to 1.47% in 2011.

In the LULUCF sector, the trend in the calculated carbon stock of forest land in Kazakhstan for the period 1990-2011 remained positive due to the increase of timber reserves in young forests. The maximum area of planted young trees were in the period 1990-1995. Absorption in this sector in 2011 was 3.09 million tons of CO₂, which is 30% more than the basic version of this index in 1990.

Specific GHG emissions per capita in 2011 comprised more than 16.7 tons of CO₂-eq. per person, of which 13 tons had only CO₂.

Summary of the National inventory submitted in 2014

Latest national inventory of anthropogenic emissions from sources and removals of sinks of greenhouse gases not controlled by the Montreal Protocol for the 1990-2012, submitted in 2014, contains the National Inventory Report (NIR) and common reporting format tables (CRF).

NIR consists of 308 pages of text, including a summary, introduction, 9 chapters, conclusion and 4 appendixes. Introduction of NIR was made by the Republic of Kazakhstan on the rights of the countries included in Annex I for the purposes of the Kyoto Protocol (KP), not included in Annex I to the UNFCCC, by the rationale for the preparation of the National Inventory Report of anthropogenic GHG emissions for the 1990-2012.

The latest submitted NIR for 1990-2012 examines six GHGs with direct greenhouse effect: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulfur hexafluoride (SF₆). For some categories, data sources on indirect GHG were presented - carbon monoxide (CO), nitrogen oxides (NO_x) and non-methane volatile organic compounds (NMVOCs) and sulfur dioxide (SO₂).

Inventory of GHG emissions in the Republic of Kazakhstan was conducted in accordance with the Revised Guidelines for National GHG Inventories IPCC 1996 (IPCC, 1996) and of the IPCC Good Practice Guidance and Uncertainty Management in National GHG Inventories (GPG IPCC, 2000). GHG Inventory in the sector "Land use, land-use change and forestry" (LULUCF) was carried out in accordance with the guidelines on good practice guidance for LULUCF (GPG

IPCC, 2003) and the Guidelines for National Greenhouse Gas Inventories (IPCC, 2006).

This inventory has been prepared in accordance with decision 18/CP.8 and 14/CP.11 of the UNFCCC, as described in the Guidelines for the preparation of national communications from Parties included in Annex I of the UNFCCC, Part I: UNFCCC guidelines for reporting annual inventories (FCCC/SBSTA/2006/9).

CRF tables of the Republic of Kazakhstan do not include the reporting of activities under paragraphs 3.3 and 3.4. of the KP in accordance with decision 14/CP.11 and 6/CMP.3, as Kazakhstan has not been included in Annex B in the first period of the KP and had no quantitative commitments. In this case it is not required to report to the KP on estimates of GHG emissions and removals from LULUCF with the decision 6/CMP.3 "Guidance on good practice for land use, land-use change and forestry (LULUCF)" in accordance with paragraphs 3 and 4 of Article 3 of the KP.

Summary of the NIR includes two sections describing GHG sources in the Republic of Kazakhstan and their dynamics, as well as the overall rate and time trends from 1990 to 2012.

Introduction consists of seven sections:

- Background information on Climate Change;
- National greenhouse gas inventory system;
- Inventory preparation process;
- Description of the methodology and data sources used;
- Brief description of key sources analysis;
- Quality assurance and quality control;
- Assessment of uncertainty.

The introductory section states that the issue of climate change is recognized as one of the major global environmental problems in Kazakhstan. This is reflected in the Strategic Plan of the Ministry of Environment for 2011-2014 and the Development Strategy of Kazakhstan until 2020. In Kazakhstan, the specific GHG emissions in 2012 amounted to 16.8 tons per capita, of which 11.7 tons accounted for CO₂.

In accordance with Article 12.1 (a) of the UNFCCC, the Kazakh inventory, or national inventories of anthropogenic emissions from sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol (National Inventory), includes information on the following greenhouse gases: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulfur hexafluoride (SF₆).

Kazakhstan has created national GHG inventory system and desires to continue its improvement. The preparation of national GHG inventories conducted on a regular basis since 2000 and is financed from the state budget. Prior to the ratification of the KP, this work was carried out within the framework of research by Ministry of Environment. After KP ratification in 2009 there was an adoption of a budget program, which is funded from the state budget and includes a component that is associated with the preparation of annual national GHG inventories.

Regulatory framework of the national system is presented in RoK's Governmental law "On approval of management and maintenance of the state inventory of GHG emissions and removals." These Rules are developed in accordance with paragraph 3 of Article 158-2 of the Environmental Code of the Republic of Kazakhstan dated January 9, 2007 as amended as of 03.12.2011, they shall govern the management and maintenance of the state inventory of GHG emissions and removals and approved by Resolution of the government of the Republic of Kazakhstan dated July 17, 2012 № 943. The authorized body in the field of Environmental Protection (Ministry of Environment) organizes the development and maintenance of the state inventory.

Kazakhstan's national inventory follows the provisions of the IPCC methodology for calculating emissions, assessment of uncertainties and the analysis of key sources. To select the appropriate Tier methodology for each sector/category a specific "decision tree" is used, which is based on an analysis of key emission sources, which add up to 95% contribution to total national emissions in the country in a given year. There are annual updated estimations of sources of GHG emissions. This is made to avoid underestimation of emissions from any activities that appeared in the year of the inventory.

Chapter 2 - Trends in GHG emissions, presents a report on GHG inventory provided by gas and source category, including aggregated data. It is stated that the main sources of GHG emissions in Kazakhstan, according to the IPCC categories are: Power (Energy) activities, industrial processes, agriculture, land use, land use change and forestry (LULUCF) and waste.

Total national greenhouse gas emissions in CO₂ equivalent without LULUCF in 2012 reached 283.55 million tons of CO₂-eq. and decreased in comparison with the 1990 base year in which they were 357.60 million tons of CO₂-eq., at 74.05 million tons of CO₂-eq. or 20.71%. On a sectoral basis they consist of 241.23 million tons CO₂-eq. of emissions from Energy activities, 16.74 tons - from Industrial processes, 21.53 mln. tons of Agriculture and 4.06 million tons of Waste. Absorption in the LULUCF sector according to revised estimates was 23.52 million tons of CO₂. Total emissions in 2012, including LULUCF, is estimated at 260.03 million tons of CO₂-eq.

Table 4 shows the GHG emissions by sectors of Kazakhstan - the sources of GHG emissions, as well as changes in the level of emissions in the last year of inventory compared to the base year.

The data in Table 4 shows that the total emissions of GHGs in 2012 was still below the baseline emissions in 1990 by 19.08%. Starting from 1990 to 1999, GHG emissions in Kazakhstan gradually decreased due to the general economic downturn in the country. Since 2001, greenhouse gas emissions started to increase. Total national GHG emissions excluding LULUCF absorption in 2012 accounted for 79.29% of the level of emissions in 1990 and compared to 2011 increased by 1.02%.

Table 4 - GHG emissions by sectors of Kazakhstan for 1990-2012., million tons of CO₂ - eq.

| Sector | 1990 | 1995 | 2000 | 2005 | 2009 | 2010 | 2011 | 2012 | Change in the reporting year compared to the base year, in % |
|---------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|--|
| Energy | 298.10 | 182.40 | 143.98 | 190.45 | 222.15 | 244.04 | 234.62 | 241.23 | -19.08 |
| Industrial processes | 17.92 | 8.17 | 10.28 | 13.26 | 14.07 | 15.77 | 17.75 | 16.74 | -6.59 |
| Agriculture | 38.97 | 23.27 | 14.56 | 19.09 | 22.10 | 22.40 | 21.61 | 21.53 | -44.77 |
| LULUCF (pure absorption) | -7.02 | -8.04 | -22.79 | -2.86 | -17.21 | -19.38 | -21.00 | -23.52 | 235.21 |
| Wastes | 2.61 | 3.08 | 3.16 | 3.47 | 3.81 | 3.89 | 3.97 | 4.06 | 55.52 |
| Total (including LULUCF) | 350.59 | 208.89 | 149.19 | 223.41 | 244.91 | 266.72 | 256.95 | 260.03 | -25.83 |
| Total (excluding LULUCF) | 357.60 | 216.93 | 171.98 | 226.27 | 262.13 | 286.10 | 277.95 | 283.55 | -20.71 |

Tables 5 and 6 is a set of data on national GHG emissions, placed in the CRF tables from last inventory.

Table 5 - Summary of the national report on greenhouse gas inventory of the Republic of Kazakhstan for 2012 according to the latest electronic CRF inventory tables submitted in 2014

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS

| GREENHOUSE GAS SOURCE AND SINK CATEGORIES | CO ₂ ⁽¹⁾ | CH ₄ | N ₂ O | HFCs ⁽²⁾ | PFCs ⁽²⁾ | SF ₆ ⁽²⁾ | Total |
|--|---------------------------------|------------------|------------------|---------------------|---------------------|--------------------------------|-------------------|
| | CO ₂ equivalent (Gg) | | | | | | |
| Total (Net Emissions)⁽¹⁾ | 198 586,70 | 49 139,58 | 9 536,23 | 1 440,18 | 1 329,38 | NA,NE,NO | 260 032,07 |
| 1. Energy | 208 306,15 | 32 195,23 | 730,18 | | | | 241 231,56 |
| A. Fuel Combustion (Sectoral Approach) | 205 706,06 | 792,29 | 730,18 | | | | 207 228,54 |
| 1. Energy Industries | 105 872,70 | 31,52 | 406,40 | | | | 106 310,63 |
| 2. Manufacturing Industries and Construction | 28 493,99 | 52,14 | 119,35 | | | | 28 665,48 |
| 3. Transport | 23 066,79 | 144,85 | 37,85 | | | | 23 249,49 |
| 4. Other Sectors | 15 289,58 | 496,87 | 57,67 | | | | 15 844,12 |
| 5. Other | 32 983,01 | 66,90 | 108,91 | | | | 33 158,83 |
| B. Fugitive Emissions from Fuels | 2 600,09 | 31 402,94 | NA,NE,NO | | | | 34 003,02 |
| 1. Solid Fuels | 193,35 | 24 166,16 | NA,NO | | | | 24 359,51 |
| 2. Oil and Natural Gas | 2 406,74 | 7 236,78 | NA,NE,NO | | | | 9 643,51 |
| 2. Industrial Processes | 13 946,09 | 20,17 | NA,NO | 1 440,18 | 1 329,38 | NA,NE,NO | 16 735,82 |
| A. Mineral Products | 4 944,89 | NO | NO | | | | 4 944,89 |
| B. Chemical Industry | 229,26 | 20,17 | NA,NO | NA | NA | NA | 249,42 |
| C. Metal Production | 8 771,95 | IE,NA,NO | NA | NA | 1 329,38 | NA,NO | 10 101,33 |
| D. Other Production | NE | | | | | | NE |
| E. Production of Halocarbons and SF ₆ | | | | NA,NO | NA | NA | NA,NO |
| F. Consumption of Halocarbons and SF ₆ ⁽²⁾ | | | | 1 440,18 | NA,NE,NO | NA,NE,NO | 1 440,18 |
| G. Other | NA | NA | NA | NA | NA | NA | NA |
| 3. Solvent and Other Product Use | NA,NE | | NA,NE | | | | NA,NE |
| 4. Agriculture | | 13 256,16 | 8 270,62 | | | | 21 526,78 |
| A. Enteric Fermentation | | 12 270,23 | | | | | 12 270,23 |
| B. Manure Management | | 868,75 | 3 272,59 | | | | 4 141,34 |

| | | | | | | | |
|---|-------------------|-----------------|---------------|-----------|-----------|-----------|-------------------|
| C. Rice Cultivation | | 117,18 | | | | | 117,18 |
| D. Agricultural Soils ⁽³⁾ | | NA,NE | 4 998,03 | | | | 4 998,03 |
| E. Prescribed Burning of Savannas | | IE | IE | | | | IE |
| F. Field Burning of Agricultural Residues | | IE,NA | IE,NA | | | | IE,NA |
| G. Other | | NA | NA | | | | NA |
| 5. Land Use, Land-Use Change and Forestry⁽¹⁾ | -23 669,91 | 106,83 | 45,18 | | | | -23 517,90 |
| A. Forest Land | -9 093,33 | 1,47 | 0,00 | | | | -9 091,86 |
| B. Cropland | -0,04 | NO | NO | | | | -0,04 |
| C. Grassland | -14 689,36 | 5,25 | 1,55 | | | | -14 682,56 |
| D. Wetlands | 112,82 | 100,11 | 43,63 | | | | 256,56 |
| E. Settlements | NO | NO | NO | | | | NO |
| F. Other Land | NO | NO | NO | | | | NO |
| G. Other | NA | NE | NE | | | | NA,NE |
| 6. Waste | 4,37 | 3 561,20 | 490,24 | | | | 4 055,81 |
| A. Solid Waste Disposal on Land | NA,NO | 3 489,51 | | | | | 3 489,51 |
| B. Waste-water Handling | | 71,68 | 490,24 | | | | 561,93 |
| C. Waste Incineration | 4,37 | NO | NO | | | | 4,37 |
| D. Other | NA | NA | NA | | | | NA |
| 7. Other (as specified in Summary I.A) | NA | NA | NA | NA | NA | NA | NA |
| Memo Items: ⁽⁴⁾ | | | | | | | |
| International Bunkers | 772,61 | 0,02 | 6,60 | | | | 779,23 |
| Aviation | 772,61 | 0,02 | 6,60 | | | | 779,23 |
| Marine | NA,NE,NO | NA,NE,NO | NA,NE,NO | | | | NA,NE,NO |
| Multilateral Operations | NO | NO | NO | | | | NO |
| CO₂ Emissions from Biomass | 356,11 | | | | | | 356,11 |
| Total CO ₂ Equivalent Emissions without Land Use, Land-Use Change and Forestry | | | | | | | 283 549,97 |
| Total CO ₂ Equivalent Emissions with Land Use, Land-Use Change and Forestry | | | | | | | 260 032,07 |

⁽¹⁾ CO₂ emissions from LULUCF should include clean emission and absorption. Absorption considered negative (-) and emission - the positive (+).

- (2) Actual emissions should be included in the total national emissions. If actual emissions are not available, potential emissions are included.
- (3) Parties that used to include CO₂ emissions from soils in the agricultural sector should indicate it in the text of the national report.
- (4) Parties must report on emissions from international aviation and marine bunker fuel from multilateral operations, as well as CO₂ emissions from biomass for reference purposes. These emissions are not included in the total national emissions, as it is believed that the biomass is constantly reproduced. These emissions also should not be included in the total national emissions from the energy sector. Biomass, that's used as fuel, is included in the total domestic fuel consumption, but the corresponding CO₂ emission is not included in the overall national total emissions, since it is considered that woody biomass is constantly reproduced. If biomass is not going on a regular basis, the net emissions of CO₂ emissions are included in the loss of biomass accumulation in the LULUCF sector.

Table 6 - Summary of the national report on greenhouse gas inventory of the Republic of Kazakhstan for 1990 according to the latest electronic CRF inventory tables submitted in 2014

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS

| GREENHOUSE GAS SOURCE AND SINK CATEGORIES | CO ₂ ⁽¹⁾ | CH ₄ | N ₂ O | HFCs ⁽²⁾ | PFCs ⁽²⁾ | SF ₆ ⁽²⁾ | Total |
|--|---------------------------------|------------------|------------------|---------------------|---------------------|--------------------------------|-------------------|
| | CO ₂ equivalent (Gg) | | | | | | |
| Total (Net Emissions)⁽¹⁾ | 260 158,33 | 72 435,58 | 17 992,28 | NA,NE,NO | NA,NE,NO | NA,NE,NO | 350 586,19 |
| 1. Energy | 249 428,51 | 47 806,84 | 867,32 | | | | 298 102,67 |
| A. Fuel Combustion (Sectoral Approach) | 243 412,25 | 1 261,81 | 867,32 | | | | 245 541,38 |
| 1. Energy Industries | 137 923,30 | 48,18 | 527,03 | | | | 138 498,51 |
| 2. Manufacturing Industries and Construction | 21 891,41 | 33,09 | 63,75 | | | | 21 988,24 |
| 3. Transport | 22 490,91 | 125,55 | 35,04 | | | | 22 651,50 |
| 4. Other Sectors | 52 516,11 | 1 038,73 | 213,08 | | | | 53 767,91 |
| 5. Other | 8 590,52 | 16,26 | 28,43 | | | | 8 635,22 |
| B. Fugitive Emissions from Fuels | 6 016,27 | 46 545,03 | NA,NE,NO | | | | 52 561,29 |
| 1. Solid Fuels | 169,06 | 37 431,26 | NA,NO | | | | 37 600,33 |
| 2. Oil and Natural Gas | 5 847,20 | 9 113,76 | NA,NE,NO | | | | 14 960,97 |
| 2. Industrial Processes | 17 869,44 | 47,39 | NA,NO | NA,NE,NO | NA,NE,NO | NA,NE,NO | 17 916,83 |
| A. Mineral Products | 5 955,81 | NO | NO | | | | 5 955,81 |
| B. Chemical Industry | 1 588,67 | 47,39 | NA,NO | NA | NA | NA | 1 636,05 |
| C. Metal Production | 10 324,96 | IE,NA,NE,NO | NA | NA | NA,NO | NA,NO | 10 324,96 |
| D. Other Production | NE | | | | | | NE |
| E. Production of Halocarbons and SF ₆ | | | | NA,NO | NA | NA | NA,NO |
| F. Consumption of Halocarbons and SF ₆ ⁽²⁾ | | | | NA,NE,NO | NA,NE,NO | NA,NE,NO | NA,NE,NO |
| G. Other | NA | NA | NA | NA | NA | NA | NA |

| | | | | | | | |
|--|------------------|------------------|------------------|-----------|-----------|-----------|------------------|
| 3. Solvent and Other Product Use | NA,NE | | NA,NE | | | | NA,NE |
| 4. Agriculture | | 22 271,32 | 16 703,20 | | | | 38 974,52 |
| A. Enteric Fermentation | | 20 537,80 | | | | | 20 537,80 |
| B. Manure Management | | 1 577,28 | 5 762,77 | | | | 7 340,05 |
| C. Rice Cultivation | | 156,24 | | | | | 156,24 |
| D. Agricultural Soils ⁽³⁾ | | NA,NE | 10 940,43 | | | | 10 940,43 |
| E. Prescribed Burning of Savannas | | IE | IE | | | | IE |
| F. Field Burning of Agricultural Residues | | IE,NA | IE,NA | | | | IE,NA |
| G. Other | | NA | NA | | | | NA |
| 5. Land Use, Land-Use Change and Forestry⁽¹⁾ | -7 139,62 | 84,25 | 39,57 | | | | -7 015,81 |
| A. Forest Land | -6 035,33 | 0,35 | 0,10 | | | | -6 034,88 |
| B. Cropland | -41,07 | NO | NO | | | | -41,07 |
| C. Grassland | -1 110,05 | 7,67 | 2,27 | | | | -1 100,11 |
| D. Wetlands | 46,82 | 76,23 | 37,20 | | | | 160,25 |
| E. Settlements | NO | NO | NO | | | | NO |
| F. Other Land | NO | NE,NO | NE,NO | | | | NE,NO |
| G. Other | NA | NE | NE | | | | NA,NE |
| 6. Waste | NA,NO | 2 225,78 | 382,19 | | | | 2 607,98 |
| A. Solid Waste Disposal on Land | NA,NO | 2 153,41 | | | | | 2 153,41 |
| B. Waste-water Handling | | 72,37 | 382,19 | | | | 454,56 |
| C. Waste Incineration | NO | NO | NO | | | | NO |
| D. Other | NA | NA | NA | | | | NA |
| 7. Other (as specified in Summary I.A) | NA | NA | NA | NA | NA | NA | NA |

| | | | | | | | |
|--|-----------------|-----------|-----------|--|--|--|-----------------|
| Memo Items: ⁽⁴⁾ | | | | | | | |
| International Bunkers | NA,NE,NO | NA,NE,NO | NA,NE,NO | | | | NA,NE,NO |
| Aviation | NE | NE | NE | | | | NE |
| Marine | NA,NE,NO | NA,NE,NO | NA,NE,NO | | | | NA,NE,NO |
| Multilateral Operations | NO | NO | NO | | | | NO |
| CO₂ Emissions from Biomass | 1 079,07 | | | | | | 1 079,07 |

| | |
|---|------------|
| Total CO ₂ Equivalent Emissions without Land Use, Land-Use Change and Forestry | 357 601,99 |
| Total CO ₂ Equivalent Emissions with Land Use, Land-Use Change and Forestry | 350 586,19 |

⁽¹⁾ CO₂ emissions from LULUCF should include clean emission and absorption. Absorption considered negative (-) and emission - the positive (+).

⁽²⁾ Actual emissions should be included in the total national emissions. If actual emissions are not available, potential emissions are included.

⁽³⁾ Parties that used to include CO₂ emissions from soils in the agricultural sector should indicate it in the text of the national report.

⁽⁴⁾ Parties must report on emissions from international aviation and marine bunker fuel from multilateral operations, as well as CO₂ emissions from biomass for reference purposes. These emissions are not included in the total national emissions, as it is believed that the biomass is constantly reproduced. These emissions also should not be included in the total national emissions from the energy sector. Biomass, that's used as fuel, is included in the total domestic fuel consumption, but the corresponding CO₂ emission is not included in the overall national total emissions, since it is considered that woody biomass is constantly reproduced. If biomass is not going on a regular basis, the net emissions of CO₂ emissions are included in the loss of biomass accumulation in the LULUCF sector.

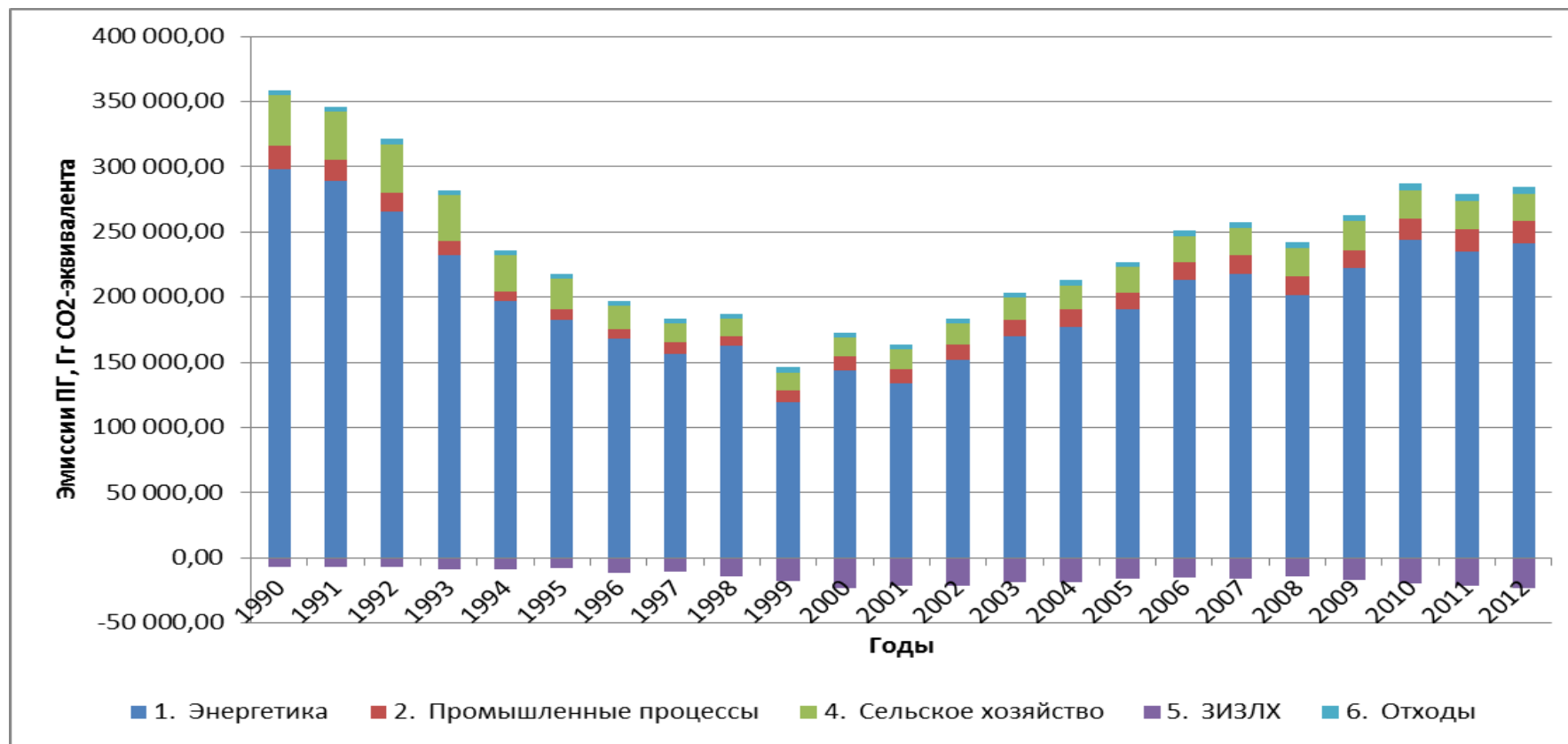


Figure 2 - Dynamics of greenhouse gas emissions in the Republic of Kazakhstan from 1990 to 2012

Figure 2 shows the dynamics of GHG emissions by sector in Kazakhstan, which is described in Chapter 3. The decline of the total national GHG emissions in 2008 was caused by the global economic crisis, which also affected the decline in industrial production and the level of greenhouse gas emissions, respectively.

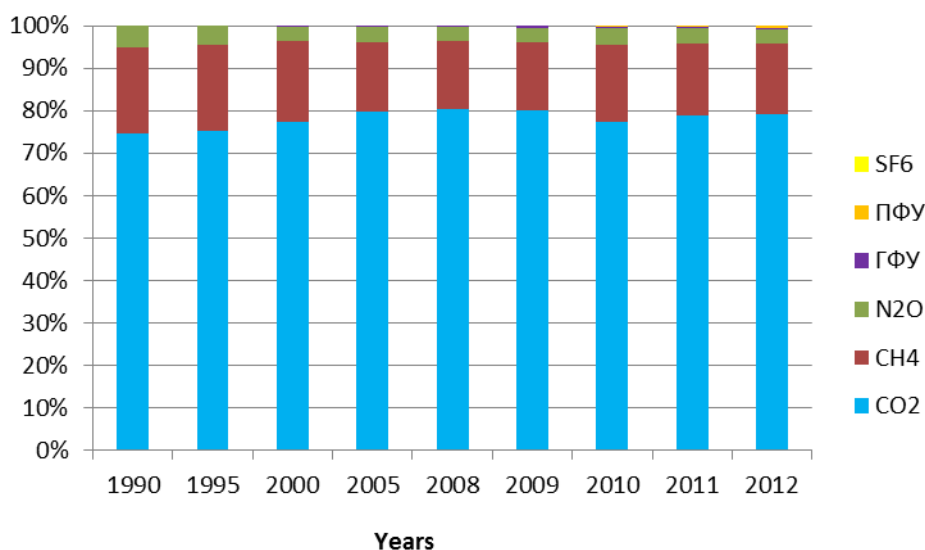


Figure 3 - Structure of greenhouse gas emissions by gas in Kazakhstan from 1990-2012gg., %

Figure 3 shows that in the distribution of shares of the each gas with direct greenhouse effect in 2012 in average 75- 81% is CO₂, that is almost three-quarters of total national emissions. All remaining gases, expressed in terms of CO₂-equivalent, are slightly less than one-fourth of the total emissions: methane and nitrous oxide are 15 - 20% and 3- 5%, respectively. The contribution of fluorinated gases (PFCs, HFCs and SF6) makes up to 1%.

Chapter 3 presents the GHG emissions in the sector "Energy" in the Republic of Kazakhstan for the period 1990 ... 2012 (CRF Sector 1) (basic approach 1.AB CRF and sectoral approach 1.AA.OFD).

Energy activity contributes the most to the total national GHG emissions in Kazakhstan. In 2012, emissions from this sector amounted to 241.23 million ton CO₂-eq., or about 84.81% of the total national GHG emissions (excluding acquisitions). In 2012, total emissions from the "Energy" sector decreased by 19.09% compared to 1990 and increased by 2.8% compared to 2011, which is more than half of the emissions from fuel combustion generated in the production of heat and electricity (in the energy industry or energetics).

In 2012, 34 million tons of CO₂-eq. was released from the sources in the "Fugitive emissions" category, out of which, emissions from production, processing and transportation of coal amounted to more than 24.36 million ton CO₂-eq. Emissions from oil and gas sector are much less and amounts to 9.64 million ton CO₂-eq. In Kazakhstan, fugitive emissions include not only leaks

during production, storage and transportation of oil and gas, but also the burning of associated gas for non-manufacturing annealing.

In chapter 4, the *Industrial Processes* present emissions from the sector, including the following categories: production of mineral products, metals (iron and steel, ferroalloys, aluminum), and the use of fluorinated gases. In Kazakhstan, industrial processes are the sources of emissions of CO₂, CH₄ and PFCs, HFCs and SF₆. Sector "Industrial processes" ranked third in the number of total GHG emissions. In the total GHG emissions, without LULUCF, in 2012, the share of the contribution of industrial processes was 5.88%.

GHG emissions from this sector in 2012 amounted to 16.74 million ton of CO₂-eq. This is by 6.59% lower than in the 1990 base year and 5.72% less than the 2011 emissions. The main sources of GHG emissions from industrial processes is the production of metals (iron and steel and of ferroalloys). Methane emissions, associated with the production of coke, make up to less than 0.5% of GHG emissions in the industrial processes. Emissions of PFCs, HFCs and SF₆ are formed either when they are used as refrigerants or when aluminum is produced (CF₄ and C₂F₆). Emissions of these gases are calculated since 1995 and they are less than 1% of the total emissions in this category.

The most significant source of GHG emissions in the industrial sector is metallurgy. Its contribution to the total greenhouse gas emissions from the sector "Industrial Processes" in 2012 amounted to more than 60% (iron production), and 15% of non-ferrous metals. The next most important source is the production of mineral products (cement), which makes up to 18%. In 2012, the total emissions from the chemical industry were 249.42 thousand tons of CO₂ equivalent, or about 1.5% of the emissions from this sector. From 1990 to 2012, they decreased by almost 5.6 times due to the low production in the chemical industry of Kazakhstan.

Chapter 5, *Solvents and other products (CRF sector 3)*, provides an overview of sources of GHG emissions and in 2012 an assessment was held, for the first time, for NMVOC emissions, which are greenhouse gases with indirect greenhouse effect for two categories: "The use of solvents and other products" and "The printing industry, the use of glues and adhesives, and other domestic use."

Chapter 6 *Agriculture (CRF sector 4)* provides an overview of the sector, as well as by categories - rice cultivation, livestock enteric fermentation, cleaning, storage and use of manure and agricultural soil. This sector is the second highest one in the total national emissions. GHG emissions from this sector in 2012 amounted to 21.53 million ton CO₂-eq., which is below the level of 1990 by 44.77% and below 2011 emissions only by 0.38%. The reduced emissions in 2012 compared to the base year of 1990 were because of a significant reduction in livestock. More than 12.27 million ton CO₂-eq. were from enteric fermentation, which is the largest source in this sector. In the second place is the *agricultural soils* category, which provides almost 5 million ton CO₂-eq. Manure management emits 4.14 million ton CO₂-eq. Rice cultivation emits only 117.2 thousand ton CO₂-eq, as rice fields occupy a small part of the arable lands in Kazakhstan and

from 1990 to 2012 their area is steadily declining. Compared to the base year the reduction was 25%.

In Chapter 7, *Land use, land use change and forestry (LULUCF) (CRF Sector 5)* provides an assessment of absorption and emission of GHGs. In the inventory of 2012, unlike previous years, there were changes associated with an additional allowance for absorption of forest and grazing lands, as well as greenhouse gas emissions from wetlands (artificial water reservoirs). The positive trend is noted in the calculated carbon stock of forest land in Kazakhstan for the period 1990-2012, which can be explained primarily by an increase in wood stocks in the forests. The total absorption in the LULUCF sector in 2012 amounted to 23.52 million ton of CO₂ and relatively to 1990 it increased 7.6 times. Absorption in the "Forest land" category has increased not so much from 6.03 million ton of CO₂ in 1990 to 9.09 million tons of CO₂ in 2012. The absorption of CO₂ by rangeland, according to updated estimates, has significantly increased from 1.1 to 14.7 million tons of CO₂, which is mainly due to the withdrawal of the pasture land in reserve lands, reduction in livestock and the terminal part of the arable land in the pasture category.

Chapter 8, *Waste (CRF sector 6)* presents GHG emissions from landfills and waste dumps, treatment of municipal wastewater and N₂O emissions from human sewage, as well as clinical waste incineration. For calculation of methane emissions from solid waste disposal sites starting from 2011, Tier 2 methodology was used based on first-order decay model. Calculations are performed separately for controlled landfills in Almaty and Astana and from unmanaged landfills for other cities. Increase in the total GHG emissions in the "Waste" sector, occurs mainly in the category of solid waste from managed landfills in Almaty and Astana due to population growth. Total emissions from this sector amounted to 4.06 million tons of CO₂-eq. in 2012, and increased by 36% compared to 1990. The largest contribution to the total emission of the "Waste" sector is the MSW category - from 80 to 85% in all years of inventory, and 86% in 2012.

In this report, unlike the previous 2013 inventory, the methane emissions from the treatment of municipal wastewater were estimated. Its contribution to the total emissions in the "Waste" sector is only 1.8%.

The contribution of emissions from wastewater treatment based on nitrous oxide emissions from human sewage is estimated to 561.93 thousand tons of CO₂-eq., which is 13.8% of the total emissions in this sector. GHG emissions from medical waste incineration in 2012 amounted to only 4.37 thousand tons of CO₂, or 0.1% of total emissions in this sector.

Chapter 9 (*Recalculations*) presents the applicable recalculations of GHG emissions in the Energy Activities, Agriculture, LULUCF and Waste sectors in response to the comments from an international group of experts on GHG inventory review.

In response to the comments of the expert group on a review report conducted in 2013, the recalculations were carried out. As a result, compared to the previous inventory, total national emissions in the base 1990 year, with LULUCF,

decreased from 356211.11 to 351474.88 Gg CO₂-eq., i.e. 4736.23 Gg, which is 1.33% less. By excluding LULUCF, emissions increased from 358377.66 to 358494.57 Gg CO₂-eq., or 116.91 Gg CO₂-eq., that is 0.03% more than in 2012 inventory. **These changes occurred mainly due to the fact that all losses in the "Energy" sector were included in "other sectors" category in the 2013 inventory.** After recalculations, 26610.27 Gg of CO₂ emissions have been moved to the "Energy Industry" category, which increased the emissions in the energy industry to 24409.94 Gg CO₂. This is further discussed in the "Energy" section of the NIR. As a result of changes in the methodology of calculation, there was an increase in the absorption of CO₂ in the LULUCF sector to 49.758 Gg, which is 229.47%. (described in detail in the LULUCF section). As a result, CO₂ emissions have decreased non-significantly only by 1.41%. As for methane and nitrous oxide in these sectors and categories, the difference was less than one percent.

In 1990, as a result of recalculations, small changes have also taken place in the "Waste" sector. Methane emissions from MSW slightly decreased due to more accurate accounting of their morphological structure of the settlement according to the first-order decay model (FOD), which amounted to 198.18 thousand tons of CO₂-equivalent which is 0.06% less.

The level of emissions was more influenced by the fact that in the 2014 report, in accordance with the expert review report, methane emissions from municipal wastewater was added. As a result, the emissions from this category were increased by 0.27%.

For the rest of the years, the emissions from these categories were also recalculated. Compared to the previous 2011 year, in the "Energy" sector, emissions were decreased by 5.47% and 5.92%, mainly due to changes in the "other sources" category. In the LULUCF sector, due to methodology changes, there was more significant change of absorption, which resulted in increase of CO₂ by 7%. Due to recalculations, changes in methane and nitrous oxide emissions from the "MSW" and "Treatment of municipal waste water" categories were less than 0.1%.

In the *Transportation* category, the fuel balance and GHG emissions over the past three years were revised and recalculated. Also, based on information from the Ministry of Agriculture on the number of special equipment (combines, tractors, motor vehicles for career), for the first time, the off-road vehicles were assigned. Data on CO₂-equivalent emissions from the off-road vehicles category were included in the "Road transport" category in Table 3.2.4.1. Also, due to the improvement of information collection, aviation bunker fuels were highlighted.

In the Agriculture sector, methane emissions from enteric fermentation of animals for 1990-2011 years were increased by 4%, due to the correction of livestock annual number. As a result, in 2011, emissions were increased by 505 Gg of CO₂-eq. For manure management the methane and carbon dioxide emissions were decreased by 1.5%, including 60 Gg of CO₂-eq. in 2011. From the storage and use of manure, carbon dioxide emissions were increased by 30%, due to the

additional calculations of indirect emissions (which previously were not calculated), including the increase of 880 Gg CO₂-eq in 2011.

In LULUCF sector, recalculations in absorption/emission for 1990-2011 were associated with the use of the IPCC Guidelines, 2006 and refinement of calculation methods. Net absorption were calculated for the *forest lands* (compared with the calculations in the NIR for 2011), there was an increase by 3 times throughout the series, including 4.267 mln/year in 1990 and 3.970 mln/year in of CO₂-eq in 2011, which is explained by the elaboration of the initial information for the last and the earlier years on the productivity of the forest on the SFF lands. In grazing land, an absorption was increased by 13.913 Gg/yr in CO₂-eq in 2011 because of the additional accounting of carbon accumulation in the "soil" tank on pasturelands, which were bred in stock (70% of the area in 2000) and the additional accounting of carbon accumulation in the "biomass" tank on former arable land, which were bred in pastures (about 8 million ha in 2000). For the first time in the NIR 2012, emission of gases from wildfires was estimated for grazing lands. On wetlands, in accordance with the IPCC Guidelines 2006, greenhouse gas emissions was estimated, for the first time, from man-made reservoirs, which accounted for 257 Gg/yr in CO₂-eq. in 2012.

Recalculations in "Waste" sector touched subcategory of municipal wastewater, emissions from which were not calculated since 2011, due to the fact that it was believed that the technology that used for aerobic cleaning in Kazakhstan does not lead to a significant formation of methane. The 2014 report, taking into account the comments of international review experts and recommendations of national experts, the share of wastewater that was treated under anaerobic conditions, was taken to be 0.3.

The final part says that the greatest contribution to the national GHG emissions in Kazakhstan brings the *Energy* sector, whose share in 2012 was 85.08% out of total GHG emissions (without LULUCF). The share of the "Fuel Combustion" category is 85.9% out of the total emissions from the "Energy" sector, the share of "fugitive emissions" accounts for 14.1% in 2012, total emissions from the "Energy" decreased by 19.08% compared to 1990 and increased by 2.8% compared to 2011.

The contribution of GHG emissions from the *agricultural sector*, without taking into account LULUCF, in 2012 amounted to 7.59%, and with LULUCF - 8.28%.

GHG emissions from this sector is below the level of 1990 by 44.77% and less emissions in 2011 only by 0.38%. The emissions were reduced in 2012 compared to the base year due to a significant reduction in livestock. Methane in 2012 accounted for 13.26 million ton of CO₂-equivalent emissions, accounting for 61% of total emissions in the sector. Nitrous oxide emissions were 8.28 million ton of CO₂ equivalent, or 39% of total emissions. Of total GHG emissions in the sector on intestinal fermentation of agricultural animals had 12.27 million tons of CO₂ - eq., or 57%, for the storage and handling of manure 4.14 million tons, or 19.23%,

for the cultivation of rice 0,12 million tons and emissions from additional nitrogen input into the soil - 5 million tons, or 23.21%.

Industrial Processes sector ranked third in terms of GHG emissions. Its share in 2012 of total national emissions without LULUCF in 2012, was 5.9%. In 2012, this sector emitted 16,74 million ton of CO₂-eq., which is 6.6% lower than in 1990 year, and 5.7% lower than in 2011.

Emissions from "Waste" sector amounted to 4.05 million tons of CO₂ equivalent in 2012. Total greenhouse gas emissions from these activities in the "Waste" sector in 2012 amounted to 4,055.82 Gg CO₂-eq., which is 77.30 Gg CO₂-eq., or 1.94% more than in the previous 2011 year. Compared to 1990, emissions in 2011 in this sector were increased by 1.5 times, or 55.13%, which is 1,441.38 Gg CO₂-equivalent, mainly due to the increase in the number and proportion of MSW biodegradable organic waste that consist MSW. The share of the contribution of the "Waste" sector in total national net emissions, excluding LULUCF absorption, amounted to 1.4% in 2012. The largest contribution to the total emissions brings solid waste category, from 82 to 88% in all years of inventory and subcategories - unmanaged landfills, from 63 to 69%.

The total absorption in the LULUCF sector in 2012 amounted to 23.52 million ton of CO₂ and relatively of 1990, they increased by 7.6 times.

III Quantified economy-wide emission reduction targets

According to the decision of COP-7, Marrakesh (Morocco), as well as in accordance with paragraph 7 of Article 1 of the Kyoto Protocol (KP), Kazakhstan is considered as Annex I Party for the purposes of the KP on the basis of which the "Party included in Annex I" means a Party included in Annex I to the Convention, as may be amended, or a Party which has made a notification under Article 4, paragraph 2 (g), of the Convention." Since Kazakhstan has submitted such notice, and only in 2009 ratified the KP, then from that moment it considered as Annex I Party for the purposes of the KP, but it should be noted that Kazakhstan has not been included in Annex B of KP, which means it has no quantitative commitments.

The question of the inclusion of Kazakhstan in Annex B of the KP with quantitative commitments had been discussed several times during the first reporting period of the KP. During the negotiations on the COP16/CMP6 in Cancun (Mexico), it was decided to defer consideration of the proposal of Kazakhstan on its inclusion in Annex B of the KP to the next session of the COP17/CMP7 in Durban (South Africa) in 2011. One of the main reasons for this delay was the need for Parties to come to the general solution of the quantitative commitments for the second budget period of the Kyoto Protocol. While it could be already expected that such a legally binding instrument would be considered on the basis of the Cancun agreements adopted by Parties on the last day of the COP-16. Lack of approved assigned amount units (AAUs) emissions in the first period of the KP did not allow the participation of Kazakhstan. However, Kazakhstan set a goal to get in Annex B, and have an access to the mechanisms of the KP. Kazakhstan is a Party to Annex I, for the purposes of the Kyoto Protocol, in accordance with Article 1, paragraph 7 of the Kyoto Protocol, but is not included in Annex I to the Convention. In a letter sent to the secretariat of the UNFCCC to quantify emission reduction targets across the economy dated 26 January 2010, Kazakhstan defined 1992 as the base year for its quantified economy-wide emission reduction targets. In a letter dated 27 January 2012, Kazakhstan has announced that it is considering changing the base year from 1992 to 1990 in the context of improving the level of ambition to reduce greenhouse gas emissions. This change in the base year was confirmed in the letter of Kazakhstan dated April 11, 2012. Thus, it was reported by the Government of Kazakhstan that national voluntary commitments to reduce emissions are set by 15% by the year 2020 and by 25% by the year 2050 from 1990 levels.

Table 7 - Description of the quantified economy-wide emission reduction targets of the Republic of Kazakhstan

| | | |
|----|--|--|
| a) | Base year | 1990 |
| b) | Gases and sectors covered | All |
| c) | The global warming potential, as they have been established in the relevant decisions adopted by the COP | Prior to 2015, used GWP (global warming potential) values of the IPCC Second national communication |
| d) | Approach to accounting for emissions and removals from LULUCF, taking into account any relevant decisions adopted by the COP | Not conducted |
| e) | The use of international market mechanisms to achieve the target of reducing emissions, taking into account any relevant decisions adopted by the COP, including a description of each source of international units and/or quotas through market mechanisms and possible extent of the contribution of each of them | Is not used, as in the first period of the KP Kazakhstan was not included in Annex B and had no quantitative commitments. |
| f) | Any other information, including the relevant accounting rules, duly taking into account any relevant decisions of the COP | At the legislative level state regulation of GHGs across businesses has been established and internal trading system on quotas of CO ₂ emissions, based on national allocation plans, has been established. |

IV. Progress in meeting quantified economy-wide emission reduction targets and related information

Actions to mitigate climate change and its impact

Overall long-term basis for the development of all the documents of the state planning system in Kazakhstan, including the strategic plans of ministries and departments, and their sector development programs is the Development Strategy of Kazakhstan until 2030.

In order to implement the development strategy until 2030 every ten years a strategic development plan is developed. It specifies the goals, objectives, priority areas of socio-economic and socio-political development of the country for the relevant period. The Strategic Development Plan of Kazakhstan until the year 2020, approved by the Decree of President Nursultan Nazarbayev on 01.02.2010

№ 922, defines climate change as one of the key factors determining the folding current trends in the world economy, marked urgent needs in the implementation of measures such as by reduction of anthropogenic GHG emissions, and to address the growing due to global warming regional problems, including the problem of water availability and quality. Herein lay the foundation for the development of measures to mitigate climate change and reduce GHG emissions, reduce energy intensity of GDP and increasing the share of renewable energy in total power consumption have been created. They are associated with actions to diversify the economy and long-term development of the power sector.

Strategic Development Plan of Kazakhstan until 2020 defined the tasks, activities and targets to reduce GHG emissions, energy efficiency and development of renewable energy in the strategic plans of the ministries and local authorities. The challenge of climate change mitigation is associated with Kazakhstan's contribution to global reduction of GHG emissions, namely with the construction of a nuclear power plant in the country, the development of small hydropower plants, wind energy and the increased use of solar energy.

With regard to the implementation of measures for the development of alternative energy sources it is expected to increase their share in total energy consumption to more than 3% in 2020, it is also planned to increase the share of renewable energy sources to 1.5% by 2015.

The Strategic Development Plan of Kazakhstan until 2020, also provides the implementation of the necessary incentives for the development of wind, solar and geothermal energy.

Priority on the development of "green" policy of low-carbon economy is included into the Strategic Development Plan of Kazakhstan until 2020, which involves the use of modern technology with low power consumption, the implementation of other measures aimed at energy conservation. Decrease in power consumption of GDP is defined as the target indicator for a progress assessment with implementation of this priority. By 2020 it is planned to reduce it by at least 25% compared to the level of 2008. The intermediate indicator defined till 2015 provides decrease in power consumption of GDP not less than by 10%.

Among the existing government programs directly related to the reduction of anthropogenic interference with the climate system, the State Program of Forced Industrial-Innovative Development (FIID) for 2010-2014 should be emphasized. In accordance with the Strategic Plan of the Republic of Kazakhstan climate change issues have been reflected in the program to diversify the national economy. This agenda direction associated with the development of low-carbon economy, reducing the negative impacts of human pressures on natural ecosystems, increased responsibility of natural resources to reduce emissions into the environment.

The same way as in the Strategic Development Plan of Kazakhstan, focus on reducing anthropogenic interference with the climate system is given in the development of the power sector. In the FIID alternative energy is related to the priority sectors of the economy. In general, among those are:

- traditional, including oil and gas, mining and smelting complex, nuclear and chemical industries, engineering, construction, pharmaceuticals;
- non-commodity and export-oriented, which include agriculture, light industry;
- sectors "of the economy of the future", including information and communication technologies, biotechnology, alternative energy, space activities.

It is assumed until 2015 to increase the share of renewable energy use. It should be noted that in FIID this number is reduced compared to the Strategic Development Plan of Kazakhstan, and it is planned to achieve the 1% instead of half percent share of alternative energy sources in the total energy consumption of the country. In general, it is envisaged in 2014 to achieve the volume of electricity generated by renewable energy sources to 1 billion KWh per year. By the year 2015, it is planned to construct wind turbines with installed capacity of 125 MW electric power generations with planned production of 400 million kWh. At the same time it is planned to commission new small hydro power plants with a total installed capacity of 100 MW with planned production of electric energy - 300 million kWh. Thus, it is planned to increase the total production of electricity using renewable energy to 1 billion KWh per year. At the same time it is planned to provide implementation measures to promote the use of renewable energy sources. Until 2020 34 objects will be put into operation, using renewable energy sources. The total capacity of the new power plants will be 1362.34 MW. 13 wind farms will generate most part of energy (1081 MW). 17 hydropower plants (HPPs) and four solar power plants will give 205.45 MW and 76 MW, respectively.

It is expected that WPF in the East Kazakhstan and North Kazakhstan areas in the suburbs of Erementau (Akmola region) will be the first operational objects. In Almaty region in the period from 2014 to 2018 there will be 3 WPFs, two of which will be in Shelek corridor and in Djungar Gate. The most power WPSs (300 MW) will be built in the Karagalinsk area of Aktobe region. In Zhambyl region in 2014 it is planned to commission Kordai WPF in Sarysu District. Here it is planned to build a 100 MW WPF. In 2015, WPFs will be put into operation in Karaganda and Kostanay regions. WPF also expected to be built in the city of Fort-Shevchenko in the Mangistau region.

It can be said that the main potential of hydropower plants (HPP) concentrated in the Almaty region. In total until 2020 it is planned to build 11 HPPs. The largest of them, with a capacity of 60.8 MW, will be placed on the river Shelek. In addition, HPPs will be put into operation in the East Kazakhstan, Zhambyl and South Kazakhstan regions.

Solar energy, to generate electricity, is expected to be used in Almaty, Zhambyl and Kyzylorda regions. The most powerful solar plant (24 MW) will be built in Zhambyl region.

Local executive authorities (akimates) of regions and limited liability partnerships are responsible for the implementation of RES (Renewable energy sources) projects. For the purpose of power plants construction the funds of investors will be involved. In addition, the government is going to subsidize the

installation of wind farms by farmers. In particular, financial support is established to the individuals who do not have connection to a power supply system – subsidizing of a half of cost of installation with a power up to 5 kWh will be carried out at the expense of budgetary funds. According to general estimates, to date, the country has 1,200 farms and pastures that have no connection to the electricity grid.

A number of projects are already actively funded. LP "The first wind power plant" (a subsidiary of the LP Samruk-Green Energy) and Eurasian Development Bank signed an agreement to open a credit line of \$ 14.2 billion to finance the construction project of "turn-key", the first major wind farm in Kazakhstan at the site Erementau in Akmola region with power of 45 MW. Electric power generation in the amount of more than 172 million kWh per year, without the expense of fossil fuels, would save more than 60 thousand tons of coal and increase the reliability of electricity supply in the region. As part of the upcoming EXPO-2017 it is planned to provide power supply for the exhibition at the expense of energy that will be generated by this wind farm.

Along with the development of renewable energy in FIID energy savings are identified as one of the key measures to support the development of priority sectors of the economy. Energy and transport infrastructure, information communications, human resources, investment, reduction of administrative barriers, tariff policy, etc. are indicated to be among other such measures. Appropriate target indicator for FIID coincides with an interim target on the Strategic Plan of the Republic of Kazakhstan. It provides 10% reduction in energy intensity of GDP, compared to 2008 levels. Increase of energy efficiency and energy saving is provided to be reached by means of development and realization of the legal, administrative and economic measures stimulating effective use of energy. The other two selection criteria are performance and export orientation. However, this aspect has not received further development in the framework of this document, which could have significantly enhanced its practical significance.

Sectoral programs. In accordance with the Law of 2012 "On energy saving and energy efficiency" in August 2013 the Government of Kazakhstan has adopted a program "Energy Efficiency- 2020". The document was developed to fulfill the President's instructions on the annual reduction in energy intensity of GDP by 10%. The main objective of the program: to create conditions in the country to promote energy savings. Improving energy efficiency is directly related to the competitiveness of the state's economy. Today, Kazakhstan's GDP energy intensity in comparison with other countries is quite high. For this indicator, Kazakhstan is behind 10-15 times from developed countries, such as Switzerland, Japan, USA, Finland, and even by 1.2 - 1.4 lower comparing to Belarus and Russia. This is due, first of all, to the structure of domestic economy. Experts estimate that if you do not carry out energy-saving policy, the 2015 energy consumption in the country will be 90 million tons of oil equivalents, and by 2020 this figure will increase to 120. The developer of the program "Energy Efficiency-2020" is the Ministry of Industry and New technologies (MINT), identified three key sectors of economy

consuming the most part of energy. In the structure of energy consumption the lead sector is industry and energy (more than 50% of energy resources), housing and utilities sector (up to 30%) and the transport sector (up to 20%).

In accordance with the Decree of the President of the Republic of Kazakhstan dated August 6, 2014 № 875 "On the reform of the public administration system of the Republic of Kazakhstan", functions and authorities in the field of energy conservation and efficiency were transferred to the Committee of Industrial Development and Industrial Safety under the Ministry of Investment and Development of the Republic of Kazakhstan.

In addition, the basic norm of the Law "On energy saving and energy efficiency" is the creation of the State Energy Registry (hereinafter - SER). SER subjects are individual entrepreneurs and legal entities that consume energy resources in the amount to 1,500 or more tons of oil equivalents per year, as well as government agencies and quasi-public sector entities. In the first year of formation, the number of subjects of the SER became 11,781 organizations. It should be noted that industrial and quasi-public enterprises consume the main bulk of energy resources and are considered to be priority sectors. In accordance with the laws of industrial and public enterprises, more than 4000 subjects of SER have to pass mandatory energy audits until July 2015.

In the Industry and Energy sectors it is planned to implement measures for mandatory energy efficiency of industrial enterprises by 30%. Prior to July 2015 more than 2 thousand industrial enterprises must undergo energy audits. Ministry of Investment and Development of the Republic of Kazakhstan puts special emphasis on the industrial sector, as it is considered as a priority sector with consumption of more than 50% of the country's energy resources and energy saving potential of up to 40%. By the results of inspections, industrial enterprises will be obliged to develop plans to improve energy efficiency. As an incentive for that state support measures included in the field of energy saving (grants, technology business incubation), which includes expansion of the range of instruments to promote energy efficiency through the program "Productiveness 2020", in particular, the measures of state support for businesses to purchase energy-saving technologies and equipment through the mechanisms of DBK-Leasing (DBK-Development Bank of Kazakhstan).

Resolution of the Government of the Republic of Kazakhstan dated December 31, 2013 adopted the concept of industrial and innovative development of the Republic of Kazakhstan for 2015 - 2019. In particular it is noted that the industry of the Republic of Kazakhstan lags behind other countries in the development of innovative and high-tech manufacturing. According to the Eurasian Institute of Competitiveness, Innovation System of the Republic of Kazakhstan occupies 45th place (out of 50 countries participating in the ranking) in terms of competitiveness among developed and developing countries. By the level of energy, economy of the Republic of Kazakhstan is one of the last places in the world, and in the manufacturing industry of the country is dominated by industries with traditionally high energy and resource consumption: metallurgy and chemical

industry. Given the global trend of increasing the importance of resources Kazakhstan needs to develop certain measures to increase resource efficiency, reduce the carbon intensity of GDP, develop the movement towards a "green economy" and increase the economic benefits of resource industries.

Sector of housing and communal services responsibility, and incentives - from tariff policy to concessional loans. The main objectives: the implementation of a successful thermo country's housing stock, repair engineers and urban utility networks and installation of common house heat meters, the revision of building codes and regulations aimed at tightening and compliance with energy efficiency. In addition, we introduce the classes of energy efficiency for buildings and household energy-consuming devices. Repair work with thermo-elements in the houses are already under the program of modernization of public utilities. As a result, heat savings for tenants can be up to 30%. In the framework of developing a common program for the development of regions, there are worked out mechanisms to encourage the population to conduct a complete thermo-residential buildings. It is expected to have subsidies which depends on the degree of energy efficiency achieved. The program is expected to have gradual transition to LED lamps and modernization of street lighting. This will reduce the consumption of electricity in the lighting sector by 60%, which contributes to the reduction of GHGs. It should be noted that LED bulbs are 5 times more efficient than mercury-containing bulbs and 20 times more efficient than incandescent bulbs. Kazakhstan has already opened 11 enterprises for the production of LEDs. The price for these domestic lamps over the last three years decreased from 4.5 thousand to 1.2 thousand tenge.

Updating of park of aircrafts and railway locomotives, stimulation of the population to purchase economically efficient cars — with decrease in consumption of fuel by 30% is provided in Transport sector, in particular, increasing taxes on cars with powerful engines and reducing them to small-displacement cars. However, since January 1, 2014 Law of the Republic of Kazakhstan dated December 5, 2013 № 152-V LRK "On Amendments and Additions to Certain Legislative Acts of the Republic of Kazakhstan on Taxation" has already introduced rules providing for an increase in the tax on vehicles with volumes engine 3000 cc. For cars with engine capacity of more than 3,000 cubic centimeters, the product (manufactured or assembled) in the Republic of Kazakhstan after December 31, 2013 or imported into the territory of the Republic of Kazakhstan after December 31, 2013, tax assessment is made by the increased rates. This action will reduce the burden on the environment and reduce greenhouse gas emissions.

Total program marked 9 ways to increase energy efficiency. It provides 78 activities totaling \$ 1 trillion 182 billion tenge. In this case, 145 billion tenge will be allocated from the national budget and from local budgets - 9.8 billion. The remaining \$ 1 trillion 177 billion tenge is planned to attract extra-budgetary resources, in particular through enterprises' own investment funds.

One of the most important public policy documents aimed at ensuring sustainable development, is the concept of the transition of the Republic of Kazakhstan to the "green" economy, approved by Presidential Decree dated May 30, 2013 № 577. This corresponds to a rate expressed in the Strategy "Kazakhstan-2050: new policy established state". The transition to a "green economy" will allow Kazakhstan to achieve its goal of becoming one of the 30 most developed countries of the world. According to forecasts of its implementation in 2050 it will lead to an increase in GDP by 3%, creating more than 500 thousand new jobs, the formation of new industries and services, ensuring high standards of quality of life for the population. The transition to "green economy" will require an annual investment of 3 to 4 billion US dollars, which is about 1% of GDP. Fixed assets of this amount will be spent on energy efficiency measures and renewable energy sources, as well as the creation of the gas infrastructure.

The set ambitious goals on increase in a share of the alternative and renewable electric power to 50% by 2050, decrease in power consumption of GDP of by 10% by 2015 and by 2020 in comparison with the level of 2008 will allow to reduce emissions of GHGs by 25% and reduce impact on climate. Decrease in consumption of energy will allow achieving reduction of emissions of CO₂ and other polluting substances.

Thus, the purposes of the Concept of transition of the Republic of Kazakhstan to the "green" economy are consistent with the goals and objectives of the UNFCCC and the Kyoto Protocol. State regulation of greenhouse gas emissions should be an important tool for the transition to clean development and climate change mitigation.

In May-August, 2012 at the level of Governmental regulations of RK and orders of Ministry of Environment Protection about 30 bylaws on regulation of emissions and absorption of GHG in the following directions were adopted:

- 1) GHG emission quotas;
- 2) monitoring, reporting and verification of GHG emissions;
- 3) projects that reduce GHG emissions and sinks;
- 4) trade and other operations with carbon units;
- 5) implementation of the provisions of the KP to the UNFCCC on climate change.

Development and the adoption of the bylaws directed on creation of national system of emissions trading system according to the Law from 03.2012 are finished by acceptance at the level of RK of regulation on "National Allocation Plan for GHG emissions for the first reporting period." It defines the installations subject to quota setting, setting quotas for them, the reserve quota for new installations, etc. First National Allocation Plan for GHG emissions was approved by the decree of the RoK № 1588 from 14.12.2012 and entered into force on 01.01.2013.

The following are the general provisions of the first NAP:

1. The National Allocation Plan for greenhouse gas emissions for 2013 (hereinafter - the National Plan) was developed in accordance with paragraph 7) of

Article 16 of the Environmental Code of the Republic of Kazakhstan, the Rules of distribution of quotas on greenhouse gas emissions, approved by the Government of the Republic of Kazakhstan dated May 7, 2012 number 586, as well as taking into account the provisions of international treaties of the Republic of Kazakhstan in the field of climate change.

2. First National Allocation Plan:

1) quotes (limits) carbon dioxide emissions from the plant operators, the total carbon dioxide emissions which exceed 20 000 tons of carbon dioxide per year;

2) determines for 2013 quantity of the distributed quota units by branches of economy, and also by users of nature for all stationary sources operated by the corresponding users of nature. The quantity of the distributed units of quotas for 2013 is equated to the carbon dioxide emissions made by users of nature as of December 31, 2010 (further – a basic level), specified in passports of their inventory;

3) determines the number of quota units that make up the reserve volume quotas, designed for new installations in the priority sectors of the economy;

4) methane emissions are not included in the distribution of quotas for GHG producers (quota enterprises) and are governed by the internal projects to reduce greenhouse gas emissions.

3. Permitted greenhouse gas emissions for the Republic of Kazakhstan in accordance with international treaties of the Republic of Kazakhstan in the field of climate change:

1) for the period from 2008 to 2020 in the amount of 4,393,281 thousand tons of carbon dioxide equivalent;

2) for the period from 2008 to 2012 in the amount of 1,800,525 thousand tons of carbon dioxide equivalent;

3) for the period 2013 - 2020 is set at 2,592,756 thousand tons of carbon dioxide equivalent.

Second National Allocation Plan for greenhouse gas emissions in the Republic of Kazakhstan (NAP-2) was approved by the Government on December 31, 2013 № 1536.

NAP-2

1) quotes (limits) carbon dioxide emissions from the plant operators for the period 2014 - 2015, emissions of which in 2012 are more than 20 000 tons of carbon dioxide;

2) establishes a baseline at the average value of the total carbon dioxide emissions for 2011-2012;

3) determines for 2014 - 2015 quantity of the distributed units of quotas by branches of economy, and also by users of nature for all sources operated by the corresponding users of nature. The quantity of the distributed units of quotas is calculated taking into account obligations for reduction of emissions of carbon dioxide of 0% of the basic line on 2014 and of 1,5% of the basic line for 2015;

4) defines quantity of units of the quotas making a reserve of volume of the quotas, designed for new installations in the priority sectors of the economy;

5) does not include methane emissions in the distribution of quotas for greenhouse gases of quota enterprises and regulates them as part of internal projects to reduce greenhouse gas emissions.

On 21st of April, 2014, President Nursultan Nazarbayev signed the Law of the Republic of Kazakhstan "On Amendments to the Code of the Republic of Kazakhstan on Administrative Offences", providing for retroactive article for exceeding quotas on greenhouse gas emissions and reduction of fines for these violations. The law gives retroactive article 243-1 of the Administrative Code (exceeding the established quotas for greenhouse gas emissions) in order to put it into effect only by July 1, 2014. Additionally it involves reducing the size of the penalty for exceeding the quotas for greenhouse gas emissions from 10 to five monthly calculation indices (MCI). The Act does not charge industrial enterprises of penalties for exceeding the emissions of greenhouse gases for 2013 and assumes stage-by-stage introduction of the mechanism of responsibility for excess of the established volume of quotas of emissions of greenhouse gases.

In order to meet their obligations in April 2014, some companies have entered the bidding to acquire the missing volume quotas.

According to information provided by Commodity Exchange "Caspian" first exchange trading of quotas for greenhouse gas emissions of CO₂ were held in March 28, 2014. The auction was attended by 5 members. There were 4 transactions, the total trading volume amounted to 32,094 tons of CO₂ quotas. Recent auctions were held in July 17, 2014.

To date there were 11 transactions, the total volume of exchange transactions amounted to 147,885 tons, the number of participants is 15. In accordance with exchange rules the total amount of transactions, rather than the volume of units sold quotas is taken into account. The actual volume was: 78,138 units of quotas. The price range was from 85 to 833 tenge per ton. The average price per ton of CO₂ was 459 tenge.

The Strategic Plan for 2010-2014, the MEP activities in the area of climate change is integrated into the strategic direction 2 "Creating mechanisms of transition of Kazakhstan to sustainable development", which aims to achieve the following strategic objectives:

2.1. Establishment of balanced development tools;

2.2. Extension of international environmental cooperation and the formation of zones of sustainable development;

2.3. Orientation of economy and creation of conditions for effective use of renewable resources and power sources;

2.4. Reduction of GHG emissions.

2.1 The target is to reducing energy intensity by 10% by 2014 compared to 2008.

The target 2.3 set the goal to introduce a mechanism of promoting the use of renewable energy and projects on the use of renewable energy, energy

conservation and energy efficiency since 2011. At the same time share use of renewable energy, to the total energy consumption, is planned to increase from 0.03% in 2010 to 0.1% in 2014.

The target 2.4 – achievement associated with the implementation of the commitments of Kazakhstan to reduce GHG emissions under the KP in the post-Kyoto period.

For this event it is planned to conduct the development of regulations on the implementation of the KP, conducting training on flexibility mechanisms and implementation of the KP internal projects to reduce GHG emissions. It is scheduled, until 2014, to conduct training seminars on the mechanisms of the KP. However, the issues of adaptation to climate change have not received further development in this document in the form of specific goals, objectives, activities and indicators.

Below is a target indicator for the national goal of transition to low-carbon development in Kazakhstan of the Strategic Plan of the Ministry of Environment for 2011-2015, and indicators of its achievement.

Table 8 - Strategic direction 2. The transition way of the Republic of Kazakhstan to the low-carbon development. Goal 2.1: Creating the conditions for the functioning of the market for trading of greenhouse gas emissions.

| № | Target indicators | Units | Planning period | | | |
|------|--|-------|-----------------|------|------|------|
| | | | 2012 | 2013 | 2014 | 2015 |
| 86-1 | Not exceeding of the 1990 level of GHG emissions | % | 73 | 76 | 79 | 81 |

Indicators of the achievement:

- Number of passports of installation of enterprises recorded in the state cadaster of sources of greenhouse gases emissions;
- Development of public registry of carbon units;
- Share of participants of market of greenhouse gas emissions trading;
- Reducing greenhouse gas emissions in the energy sector of economic during the first period of the market of trading for greenhouse gases emissions under market mechanism of greenhouse gas emissions reducing;
- Volume of electricity generated by renewable energy sources.

Department of Strategic Planning and Monitoring, Department of Environmental Law and Legal Support and the Department of "green" technologies and attraction of investments are also the main interest in the context of promotion of theme of climate change in the structure of the MEP (from 2014 – MEWR of RK). Activities for the implementation of measures to reduce GHG emissions at the level of various sectors of the economy, natural resources users, operators of individual industrial installations are within the competence of the

Committee of Environmental Regulation and Control MEWR of RK. All licensing and control functions in the field of environmental protection and natural resources using are the responsibility of the Committee. The Committee has territorial Departments of ecology in all 14 regions of the country and in Almaty and Astana cities. Expert and technical support to the MEP activity on climate change is carried out by its subordinate RSE "KazNIIIEK", in April 2013, reorganized into JSC "Zhasyl Damu".

MINT of RK is the central executive office presiding in supporting the use of renewable energy and energy efficiency. In the structure of MINT an important role in terms of the development of these activities performed by the Department of Strategic Planning and the Department of new technologies and energy efficiency, the Committee of state energy supervision and control. At the level of subordinate organizations stock companies "National Innovation Fund" and "Kazakhenergoexpertise" can be distinguished.

Table 9 provides information on target values of emission reduction for the base year of 1990.

Table 9 - Information on target values of emission reduction in the Republic of Kazakhstan (the base 1990 year)

| | Indicator | GHG emissions, t |
|----|--|------------------|
| a) | Total GHG emissions excluding LULUCF | 357 601.99 |
| b) | Emissions and/or removals from LULUCF based on used approach for accounting, taking into account any relevant decisions of the COP, and activities and/or the land that will be subject for accounting | -7 015.81 |
| c) | Total GHG emissions including LULUCF | 350 586.19 |

V. Forecasts

Updated scenario of greenhouse gas emissions in the Republic of Kazakhstan to the 2020-2030 was drawn up on the basis of socio-economic development in 2014-2018 years approved at the meeting of the Government of the Republic of Kazakhstan (Minutes № 33 dated August 28, 2013).

It is assumed that the sectoral structure of the economy will not change significantly in this forecast on comparison with the proportions of the previous periods in 2014 - 2018 years. Leaning on fundamental factors of formation of a price environment at commodity exchanges, significant growth in production in traditional export-oriented branches of economy is not expected in the predicted period. It is made taking into account policy and measures for development of

power branch, industry, transport, agriculture and other branches of economy at preservation of average expected growth rates till 2030.

Average annual growth of gross agricultural output will be 3.8%. Gross value added (GVA) of mining will grow at a rate of 1.5% to 7.5%. The share of mining industrial will drop to around 14.4% in GDP in 2018. GVA of industry will grow at a rate of 2.7% to 6.0%.

Introduction of new production capacity in the manufacturing industry as part of the industrialization program will help to increase the share of processing to 11.8% in the GDP in 2018. Average annual growth rate of GVA will amount to 2.7% in the steel industry in 2014 - 2018 years. Development of metallurgy allow to stimulate potential related industries (machinery, chemical industry, etc.), to increase and to diversify the foreign trade.

GVA growth in the chemical industry by an average of 2.6% per year will be provided through the new competitive chemical plants development in the program of industrialization, modernization and upgrading of existing enterprises during the forecast period. The average annual growth of GVA electricity will be 4.0% over the forecast period.

The average growth rate of sectors, which leads to the emission of greenhouse gases considers in development of the scenarios of overall economic development. In view of the Concept of transition to "green" economy it is expected that by 2020, the level of emissions in the power sector will be maintained at the level of 2012 and the share of renewable in electricity generation will be 3% by 2020 and 30% by 2030. Emissions in this sector will increase by 8 million tons after entering the Balkhash thermal power station and its output at full capacity, through which CO2 emissions will increase by 8 million tons by 2020.

Table 10 - Average rates of GVA in key sectors of the economy of the Republic of Kazakhstan for 2013-2030 years

| Sector of the economy | Energy | Industry | Agriculture | Waste |
|--|--------|----------|-------------|-------|
| Average growth rate of GVA, % per year | 1.2 | 4.3 | 3.8 | 2.0 |

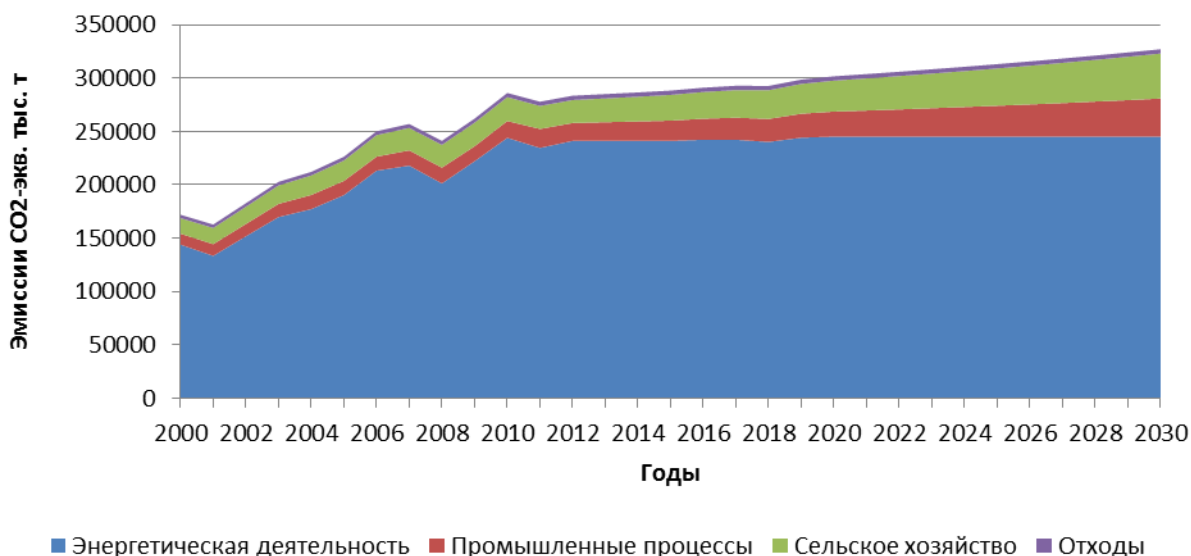


Figure 4 - Actual emissions and scenario of "overall economic development" in Kazakhstan until 2030, excluding LULUCF

A graph of the actual total GHG emissions in Kazakhstan for 1990-2012 years and forecast to 2030 for the main sectors of the economy with the adopted growth of GVA and constraints of growth of emissions in the power sector (Table 10) are at the Figure 4. The energy sector has the main influence on the growth of GHG as it can be seen from the diagram. In this scenario, the overall GHG emissions do not reach the level of the base in 1990 nor in 2020, nor in 2030.

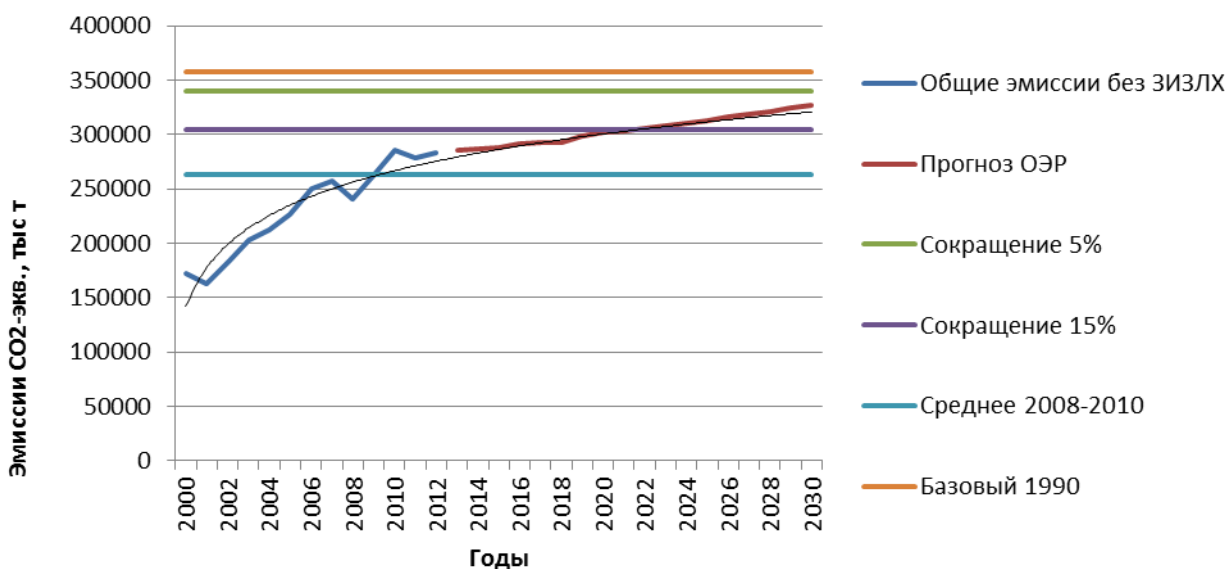


Figure 5 - Total greenhouse gas emissions without LULUCF and the forecast for 2013-2030 years according to the scenario of "overall economic development" (OED) approximated by logarithmic trend line

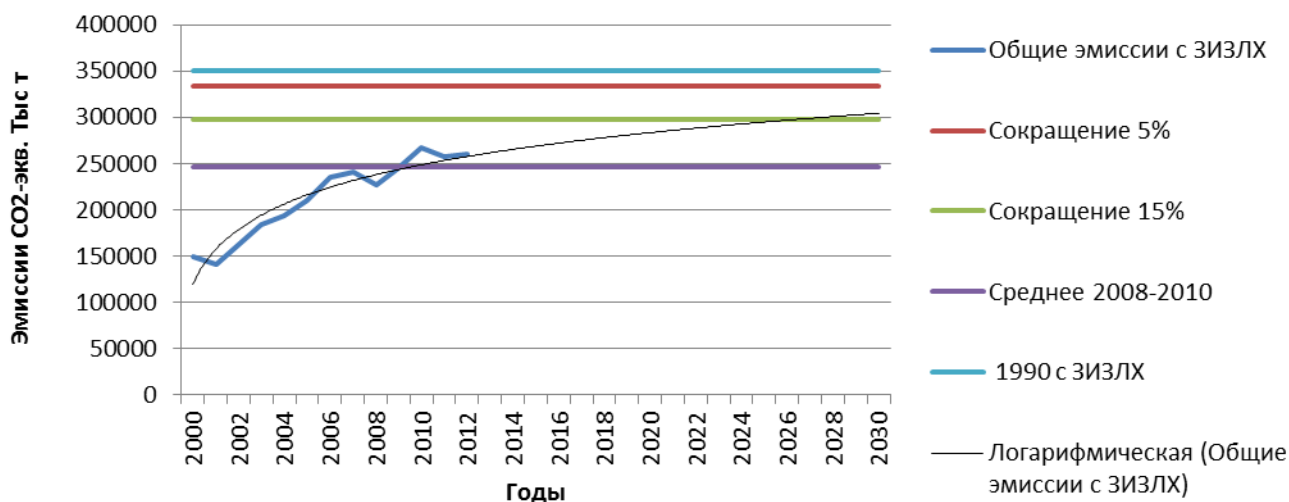


Figure 6 - Total greenhouse gas emissions with LULUCF and the forecast for 2013-2030 years according to the scenario of “overall economic development” (OED) with a logarithmic trend line

Figures 5 and 6 show the total GHG emissions and the forecast that was built by using logarithmic approximation of the trend line.

Table 11 shows the possible reduction in emissions with LULUCF and without LULUCF by 2020 and 2030.

Table 11 – possible emissions reduction in percentage relative to basic level at “overall economic development” scenario.

| Levels of GHG emissions reduction including LULUCF | 2020 | 2030 |
|--|--------|-------|
| 0 % | 18 % | 12 % |
| 5 % | 14 % | 8 % |
| 15 % | 3 % | -3% |
| 30 % (with Doha amendment) | - 12 % | -17 % |
| Levels of GHG emissions reduction excluding LULUCF | 2020 | 2030 |
| 0 % | 16 % | 9 % |
| 5 % | 11 % | 4 % |
| 15 % | 1 % | -6% |
| 30 % (with Doha amendment) | -11% | -18% |

The commitments of GHG emission reduction by 2020 can be set at a level below 15% of the base year of 1990 under the considered scenario as it can be seen from the data in Table 11. The emission reduction can be achieved by only 5% relative to the base year by 2030. If to be guided by the requirements of the Doha amendment, taking into account the average level of emissions in 2008-2010, it

will be possible to perform these obligations in the future only in case of the transition to innovative and high-tech manufacturing, energy efficiency and reduction in the carbon intensity of GDP, more stringent measures to reduce emissions, which are unattainable in the present state of the economy.

VI. Extension of financial and technological support for strengthening of Parties capacity which are developing countries.

As a country that is not included in Annex II of the UNFCCC, the Republic of Kazakhstan has no obligation to provide financial and technological support in the field of capacity for developing countries not included in Annex I to the Convention.

Conclusion

The updated information on the actions for mitigation of climate change corresponding to national conditions pursuant to paragraph 50 of decision 1/CP.16 and decision 2/CP.17 "The UNFCCC Guidelines for submission by Parties not included in Annex I to the Convention of the biennial reports containing updated information" is provided in the first biennial report.

The report includes information on national GHG inventories, domestic institutional and legislative basis of performance of obligations under the UNFCCC and the KP, the measures taken by the Government of Kazakhstan to build a sustainable and efficient economy, aimed at the country's transition to a "green" way of development.

Accepted Concept of transition to a "green economy" will allow to Kazakhstan to ensure a high level of quality of human life while minimizing the impact on the environment and prevent degradation of natural resources, in accordance with the obligations under multilateral environmental international agreements.

Ratification of the Kyoto Protocol in 2009 allowed Kazakhstan to reach a new level of participation in the global effort to mitigate climate change and its negative impact on economic development and natural resources. Domestic carbon market is defined to be the main instrument of state policy in the field of climate change and the development of a national system of emissions control in Kazakhstan in the absence of international quantitative commitments to reduce greenhouse gas emissions. It allows developing a system of state regulation of greenhouse gas emissions, contributing to the implementation of low-carbon technologies, energy conservation and efficiency of the economy. Established national emissions trading system in Kazakhstan is a mechanism for the implementation of the economy transition on an innovative "green" way of development. It will also contribute to the modernization of old equipment in enterprises, as well as investments attraction.

Law "On introduction of changes and amendments in certain legislative acts of the Republic of Kazakhstan on environmental issues", signed by the President of the Republic of Kazakhstan Nursultan Nazarbayev, on 3 December 2011, allowed to enactment of a system of state regulation of greenhouse gas emissions at the legislative level. It consists of accounting and control of GHG emissions and introduction since 2013 of domestic market of trade by quotas on emissions of greenhouse gases on the basis of exchange trade.

First National Allocation Plan for greenhouse gas emissions for 2013 year enacted by the Presidential Decree from 1 January 2013. The Second National Allocation Plan for GHG emissions for 2014-2015 has been prepared and adopted.

The State cadaster of enterprises on greenhouse gas emissions has been developed and maintained. The State Register of carbon units has been established. It is adapted to the system of trading of the Republic of Kazakhstan by transferring units of quotas to accounts of natural resource users by assigning each carbon unit

a unique identification number in accordance with the National Allocation Plan for greenhouse gas emissions.

Developed new projections of greenhouse gas emissions, taking into account the measures pledged in the adopted development plans and programs and Concept of the transition to a "green" economy showed that the conditions of the Doha amendment are unacceptable for Kazakhstan. The results of projections based on scenarios of socio-economic development and the adopted Concept of the transition to a "green" economy, showed that the commitments to reduce GHG emissions by 2020 could be increased from 5 to 15% relative to the 1990 base year. It can be expected to reduce emissions by only 5% compared to the base year by 2030 at the present level of technological development.

Kazakhstan intends to actively participate in the preparation of a new global climate change agreement, which will replace the Kyoto Protocol after the year 2020.

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