# THE FIRST BIENNIAL TRANSPARENCY REPORT OF THE KYRGYZ REPUBLIC UNDER UNFCCC PARIS AGREMMENT

**MINISTRY OF NATURAL RESOURCES, ECOLOGY AND TECHNICAL SUPERVISION OF THE KYRGYZ REPUBLIC**

**Bishkek, 2025**

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# Document references

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# Foreword

Dear reader,

we present to your attention the First Biennial Transparency Report (BTR 1) of the Kyrgyz Republic under the United Nations Framework Convention on Climate Change (UNFCCC), prepared in accordance with the decisions adopted by the Conferences of the Parties to the Convention and in full compliance with the internationally accepted methodology of the Intergovernmental Panel on Climate Change (IPCC).

Climate change has a significant impact on the Kyrgyz Republic and exacerbates the risks and challenges to the achievement of the Sustainable Development Goals (SDGs). Therefore, the principal focus of current climate action is the reduction of risks associated with adverse climate impacts and adaptation to them. The intensifying manifestations of climate-related hazards, the melting of glaciers, the effects on human health, and the threats to food, energy and environmental security remain at the center of Kyrgyzstan's climate response.

The Kyrgyz Republic is a country with low levels of greenhouse gas (GHG) emissions, as confirmed by historical data. At the same time, the positive dynamics of socio-economic development over the past decades have been accompanied by a considerable increase in GHG emissions. Therefore, alongside adaptation to climate change, Kyrgyzstan attaches significant importance to climate change mitigation.

Monitoring GHG emissions and maintaining the National Greenhouse Gas Inventory by sources and removals by sinks is one of the priorities of the Ministry of Natural Resources, Ecology and Technical Supervision of the Kyrgyz Republic (MNRETS). This process provides the information necessary for decision-making in the preparation of our Nationally Determined Contributions (NDCs) towards the achievement of the goals of the Paris Agreement and the attainment of carbon neutrality by Kyrgyzstan in 2050.

The National Inventory Report (NIR) constitutes an important component of Kyrgyzstan's climate reporting under the UNFCCC. It provides information on GHG emissions and removals for the reporting period 2021–2023, as well as the results of recalculations of the time series of data on emissions by sources and removals by sinks for the period 1990–2023. This document has also been prepared in the course of developing the First Biennial Transparency Report (BTR 1) and serves as an informational supplement to it.

The updated NDC was prepared and submitted to the UNFCCC in 2021, and information on its implementation is presented in this document.

Climate change affects each of us and requires increasing efforts, tangible joint actions, and support that will enable all countries to ensure a green and climate-resilient future.

With kind regards,

**Meder Mashiev**
National Focal Point for the United Nations Framework Convention on Climate Change in the Kyrgyz Republic
Minister of Natural Resources, Ecology and Technical Supervision of the Kyrgyz Republic

# List of Abbreviations and Acronyms

| | |
|---|---|
| AC | Aarhus Center |
| AD | Activity Data |
| ADB | Asian Development Bank |
| Agri. | Agriculture |
| AP | Adaptation Plan |
| AR 5 | Fifth Assessment Report of the IPCC |
| BAU | Business-as-Usual Scenario |
| BGPP | Biogas Power Plant |
| BTR | Biennial Transparency Report |
| BUR | Biennial Update Report |
| CAIAG | Central Asian Institute for Applied Geosciences |
| CJSC | Closed Joint Stock Company |
| CM | Cabinet of Ministers |
| CMA | Conference of the Parties serving as the Meeting of the Parties to the Paris Agreement |
| CNG | Compressed Natural Gas |
| COP | Conference of the Parties |
| CRT | Common Reporting Tables |
| CRVA | Climate Risk and Vulnerability Assessment |
| CTCN | Climate Technology Centre and Network |
| CTF | Common Tabular Formats |
| DM&FES | Department for Monitoring and Forecasting of Emergency Situations |
| DRR | Disaster Risk Reduction |
| EBRD | European Bank for Reconstruction and Development |
| EF | Emission Factors |
| ES | Executive Summary |
| ESCAP | United Nations Economic and Social Commission for Asia and the Pacific |
| ETF | Enhanced Transparency Framework |
| FAO | Food and Agriculture Organization of the United Nations |
| FEC | Fuel and Energy Complex |
| FER | Fuel and Energy Resources |
| FNC | Fourth National Communication |
| FS | Forest Service |
| GACMO | Greenhouse Gas Abatement Cost Model |
| GDP at PPP | Gross Domestic Product at Purchasing Power Parity |
| GEF | Global Environment Facility |
| GHG | Greenhouse Gases |
| GIS | Geographic Information Systems |
| GIZ | Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH |
| GWP | Global Warming Potential |
| HCS | Housing and Communal Services |
| HPP | Hydropower Plant |
| IATI | International Aid Transparency Initiative |
| ICE | Internal Combustion Engines |
| IFAD | International Fund for Agricultural Development |
| IPCC | Intergovernmental Panel on Climate Change |
| IPPU | Industrial Processes and Product Use |

| | |
|---|---|
| IRENA | International Renewable Energy Agency |
| KChMP | Kyrgyz Chemical and Metallurgical Plant |
| KR | Kyrgyz Republic |
| KSSR | Kyrgyz Soviet Socialist Republic |
| LLC | Limited Liability Company |
| LSGBs | Local Self-Government Bodies |
| LULUCF | Land Use, Land-Use Change and Forestry |
| M&E | Monitoring and Evaluation System |
| ME | Municipal Enterprise |
| MEC | Ministry of Economy and Commerce |
| MES | Ministry of Emergency Situations |
| MEdS | Ministry of Education and Science |
| MIA | Ministry of Internal Affairs |
| MNRETS | Ministry of Natural Resources, Ecology and Technical Supervision |
| MoE | Ministry of Energy |
| MoH | Ministry of Health |
| MPGs | Modalities, Procedures and Guidelines under the UNFCCC |
| MRV | Monitoring, Reporting and Verification |
| MSW | Municipal Solid Waste |
| MTC | Ministry of Transport and Communications |
| MWRAPI | Ministry of Water Resources, Agriculture and Processing Industry |
| NAS | National Academy of Sciences |
| NC | National Communication |
| NDC | Nationally Determined Contribution |
| NEGK | National Electric Grids of Kyrgyzstan |
| NGHGI | National Greenhouse Gas Inventory |
| NID | National Inventory Document |
| NIR | National Inventory Report |
| NLA | Normative Legal Act |
| NSC | National Statistical Committee |
| OECD | Organisation for Economic Co-operation and Development |
| OJSC | Open Joint Stock Company |
| PA | Paris Agreement |
| PF | Peasant Farm |
| PPP | Public–Private Partnership |
| PUA | Pasture Users Association |
| PVS | Photovoltaic Systems |
| QA/QC | Quality Assurance and Quality Control |
| RADWC | Rural Association of Drinking Water Consumers |
| RES | Renewable Energy Sources |
| RS | Remote Sensing |
| SAAC&CU[1] | State Agency for Architecture, Construction and Communal Utilities under the Government of the KR |
| SCADA | Supervisory Control and Data Acquisition |
| SE | State Enterprise |
| SFF | State Forest Fund |
| SI | State Institution |
| SNiP | Construction Norms and Regulations – Building Codes |

[1] The names of institutions are indicated according to their status as of 2023.

| | |
|---|---|
| SPNA | Specially Protected Natural Areas |
| SPP | Solar Power Plant |
| SSP | Shared Socioeconomic Pathways |
| TAP | Technological Action Plan |
| TEG | Technical Expert Group |
| TER | Technical Expert Review |
| TNC | Third National Communication |
| TPP | Thermal Power Plant |
| UNDP | United Nations Development Programme |
| UNEP | United Nations Environment Programme |
| UNFCCC | United Nations Framework Convention on Climate Change |
| UNICEF | United Nations Children's Fund |
| UNITAR | United Nations Institute for Training and Research |
| WAM | With Additional Measures Scenario |
| WB | World Bank |
| WM | With Measures Scenario |
| WPP | Wind Power Plant |
| WUA | Water Users Association |

## Chemical Formulas of Greenhouse Gases and Precursors, and Units of Measurement

| | |
|---|---|
| $CO_2$ | Carbon dioxide |
| $CH_4$ | Methane |
| $N_2O$ | Nitrous oxide |
| HFC | Hydrofluorocarbons |
| PFC | Perfluorocarbons |
| $SF_6$ | Sulphur hexafluoride |
| $NF_3$ | Nitrogen trifluoride |
| CO | Carbon monoxide |
| Nox | Nitrogen oxides |
| NMVOC | Non-methane volatile organic compounds |
| $SO_2$ | Sulphur dioxide |
| Gg | Gigagram = 1,000 tonnes (kilotonne) |
| Kt | Kilotonne |
| TFE | Tonne of fuel equivalent |
| TOE | Tonne of oil equivalent |
| J | Joule, unit of energy and heat in the International System of Units (SI) |
| hPa | Hectopascal, unit of atmospheric pressure |

## Decimal Prefixes for Units of Measurement

| Multiplier | Prefix | | Symbol | | Meaning |
|---|---|---|---|---|---|
| | Russian | International | Russian | International | |
| $10^1$ | дека | deca | да | da | Increase by a factor of 10 |
| $10^2$ | гекто | hecto | г | h | Increase by a factor of 100 |
| $10^3$ | кило | kilo | к | k | Increase by a factor of 1,000 |

| Multiplier | Prefix | | Symbol | | Meaning |
|---|---|---|---|---|---|
| | Russian | International | Russian | International | |
| $10^6$ | мега | mega | М | M | Increase by a factor of one million ($10^6$) |
| $10^9$ | гига | giga | Г | G | Increase by a factor of one billion ($10^9$) |
| $10^{12}$ | тера | tera | Т | T | Increase by a factor of one trillion ($10^{12}$) |
| $10^{15}$ | пета | peta | П | P | Increase by a factor of one quadrillion ($10^{15}$) |
| $10^{18}$ | экса | exa | Э | E | Increase by a factor of one quintillion ($10^{18}$) |
| $10^{21}$ | зетта | zetta | З | Z | Increase by a factor of one sextillion ($10^{21}$) |
| $10^{24}$ | иотта | yotta | И | Y | Increase by a factor of one septillion ($10^{24}$) |

# Executive Summary

The First Biennial Transparency Report (BTR 1) of the Kyrgyz Republic has been prepared in accordance with Article 13 of the Paris Agreement and the decisions adopted at the first session of the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA), in particular Decision 18/CMA.1. The Report also complies with the Modalities, Procedures and Guidelines (MPGs) of the transparency framework for action and support, as provided for in Article 13 of the Paris Agreement and set out in the Annex to the aforementioned Decision 18/CMA.1. In addition, the BTR-1 of the Kyrgyz Republic has been prepared taking into account the Operational Guidance for the application of the MPGs under the enhanced transparency framework referred to in Article 13 of the Paris Agreement (Decision 5/CMA.3).

This document continues the climate reporting of the Kyrgyz Republic under the United Nations Framework Convention on Climate Change (UNFCCC) and presents information on the country's climate actions for the period 2021–2023. Accordingly, all information described herein covers this period. The BTR-1 consists of an introduction, four chapters, and four annexes.

The Introduction provides information on the main UNFCCC events and the participation of the Kyrgyz Republic therein, as well as on the institutional arrangements for the preparation of the BTR-1.

In accordance with Decision 18/CMA.1 (Section E, paragraph 12), the report on the national inventory of anthropogenic emissions by sources and removals by sinks of greenhouse gases (GHGs) may be submitted as a separate document. This practice is applied by the majority of Parties to the Paris Agreement. In line with this international practice, the national GHG inventory of the Kyrgyz Republic has likewise been submitted as a separate document. Chapter 1 of the BTR-1 provides a concise summary of the organizational arrangements and the main results of the national GHG inventory.

## Chapter 1. Information on Anthropogenic GHG Emissions by Sources and Removals by Sinks

**Chapter 1 of the Report** presents information on the national circumstances and the institutional arrangements for conducting the national greenhouse gas inventory, as well as a summary from the National Inventory Report on GHG emissions in 2023, disaggregated by gases and sources. The chapter also describes the emission trends for the period 1990–2023, provides an overview of total and net emissions, and outlines the dynamics of emissions for seven categories of direct greenhouse gases ($CO_2$, $CH_4$, $N_2O$, HFCs, PFCs, $SF_6$, $NH_3$) and four categories of indirect greenhouse gas preursors ($NO_x$, CO, NMVOC, and $SO_2$), as well as by the source categories of GHG emissions and removals:

- Energy
- Industrial Processes and Product Use
- Agriculture
- Land Use, Land-Use Change and Forestry
- Waste

In 2023, carbon dioxide ($CO_2$) emissions amounted to 11,284.78 kt, methane ($CH_4$) emissions amounted to 5,611.58 kt $CO_2$ eq., nitrous oxide ($N_2O$) emissions amounted to 1,951.69 kt $CO_2$ eq., and emissions of all covered hydrofluorocarbons (HFCs) amounted to 526.110 kt $CO_2$ eq.

Total greenhouse gas (GHG) emissions from all sources and for all gases in 2023 amounted to 19,375.959 kt $CO_2$ eq., representing a 30.5% decrease compared to the base year 1990. Removals by GHG sinks amounted to 10,309.203 kt $CO_2$ eq., representing an increase of 6.9% compared to 1990. Net GHG emissions totaled 9,066.756 kt $CO_2$ eq., which corresponds to 50.3% of the 1990 level of net GHG emissions.

The largest share of GHG emissions was attributed to the Energy sector — 10,651.90 kt $CO_2$ eq., or 55% of the total GHG emissions of the Kyrgyz Republic in 2023, which is 48.8% lower than the 1990 level.

Within the sector, the largest share of emissions was attributed to the category Transport — 3,601.42 kt $CO_2$ eq., or 33.8% of sectoral emissions. Emissions under the category Energy Industries amounted to 3,318.00 kt $CO_2$ eq., representing 31.1% of sectoral emissions. Emissions from the category Other Sectors (emissions from boiler plants and the residential sector) amounted to 2,558.55 kt $CO_2$ eq., or 24% of sectoral emissions. Fugitive emissions from fuels accounted for 644.28 kt $CO_2$ eq., or 6% of sectoral emissions, while emissions under the category Manufacturing Industries and Construction totaled 531.14 kt $CO_2$ eq., or 5% of sectoral emissions.

The second largest source of GHG emissions after the Energy sector in 2023 was the Agriculture sector, with emissions amounting to 5,754.41 kt $CO_2$ eq., or 29.7% of total emissions of the Kyrgyz Republic, which is 0.1% higher than in 1990. The largest emissions within agriculture were from the category Enteric Fermentation, which amounted to 3,783.69 kt $CO_2$ eq., or 65.8% of sectoral emissions, followed by emissions from the category Direct $N_2O$ Emissions from Managed Soils, which totaled 876.29 kt $CO_2$ eq., or 15.2% of the sector's total GHG emissions. Emissions from Indirect $N_2O$ Emissions from Managed Soils accounted for 311.42 kt $CO_2$ eq., or 5.4% of sectoral emissions, while Indirect $N_2O$ Emissions from Manure Management amounted to 192.31 kt $CO_2$ eq., or 3.3% of sectoral emissions. Emissions from the category Manure Management were 505.15 kt $CO_2$ eq., or 8.8% of sectoral emissions. Emissions from Rice Cultivation totaled 70.62 kt $CO_2$ eq., or 1.2%, and emissions from the use of urea amounted to 14.92 kt $CO_2$ eq., or 0.3% of sectoral emissions.

The third largest source of GHG emissions in 2023 was the Industrial Processes and Product Use (IPPU) sector, which accounted for 2,008.04 kt $CO_2$ eq., or 10.4% of the Kyrgyz Republic's total emissions. Compared with 1990, this represents an increase of 130.4%. Emissions from the category Cement Production in 2023 amounted to 1,396.18 kt $CO_2$ eq., representing 69.5% of total emissions of the sector Refrigeration and Air Conditioning contributed 491.26 kt $CO_2$ eq., or 24.5%. Foam Blowing Agents accounted for 34.85 kt $CO_2$ eq. (1.7%), while Ceramics contributed 29.49 kt $CO_2$ eq. (1.5%). Lime Production added 20.26 kt $CO_2$ eq. (1.0%), and Glass Production 20.12 kt $CO_2$ eq. (1.0%). Lubricant Use resulted in 15.63 kt $CO_2$ eq. (0.8%). Minor sources included the Metallurgical Industry with 0.19 kt $CO_2$ eq. (0.01%) and Paraffin Use with 0.06 kt $CO_2$ eq. (0.003%).

The fourth largest source of GHG emissions in 2023 was the Waste sector, with emissions amounting to 959.80 kt $CO_2$ eq., or 5% of the total emissions of the Kyrgyz Republic, which is 97.5% higher than in 1990. The largest emissions within the sector were from the category Wastewater Treatment and Discharge, totaling 562.92 kt $CO_2$ eq., or 58.6% of sectoral emissions. Emissions from the category Solid Waste *Disposal* amounted to 381.91 kt $CO_2$ eq., or 39.8% of sectoral emissions. Emissions from the category Incineration and Open Burning of Waste were 13.21 kt $CO_2$ eq., or 1.4% of sectoral emissions, while emissions from Biological Treatment of Solid Waste totaled 1.76 kt $CO_2$ eq., or 0.2% of sectoral emissions.

The sector Land Use, Land-Use Change and Forestry (LULUCF) is a net sink of $CO_2$, with removals in 2023 amounting to 10,208.89 kt $CO_2$, which is 6.9% higher than in 1990. Removals occur through three categories: Forest Land, with removals of 8,213.66 kt $CO_2$ in 2023, representing 79.7% of total removals; Cropland, with removals of 1,767.18 kt $CO_2$, or 17.1% of total removals; and Grassland, with removals of 328.36 kt $CO_2$, or 3.3% of total $CO_2$ removals of the sector.

Emissions in the LULUCF sector under the category *Burning on Forest Land* in 2023 occurred as a result of wildfires over an area of 79.3 ha and amounted to 0.315 kt $CO_2$ eq. These emissions are accounted for under the category 4.A.1. Forest land remaining forest land.

# Chapter 2. Information necessary to track progress in the implementation and achievement of the Nationally Determined Contribution under Article 4 of the Paris Agreement

Chapter 2 of the First Biennial Transparency Report presents information on tracking progress towards achieving the targets of the Nationally Determined Contribution of the Kyrgyz Republic under the Paris Agreement. It provides information on the national circumstances and institutional mechanisms ensuring the implementation of the measures of the NDC Implementation Plan, developed in 2023, as well as the institutional arrangements for tracking NDC progress. This chapter also presents a description of the NDC of the Kyrgyz Republic, along with information necessary for tracking progress in achieving the national contribution.

The NDC represents the plan of the Kyrgyz Republic to address climate change and its contribution to global efforts to reduce greenhouse gas emissions. It sets out the pathways for low-carbon transformation up to 2030, taking into account national priorities and the Sustainable Development Goals. The Kyrgyz Republic recognizes the importance of adopting a Low-Carbon Development Strategy and a National Adaptation Policy.

The achievement of the NDC targets is based on mitigation measures and policies covering five setors. However, the main mitigation potential is concentrated in the sectors Energy, Agriculture, *and* Forestry and Other Land Use (FOLU).

n terms of mitigation, the ambition of the Kyrgyz Republic's Second NDC has been enhanced, with the new targets set at an unconditional reduction of GHG emissions by 16.63% by 2025 and by 15.97% by 2030 compared to the business-as-usual (BAU) scenario. Subject to the provision of international support, GHG emissions are to be reduced by 36.61% by 2025 and by 43.62% by 2030 relative to the BAU scenario.

The chapter also presents the key indicators for tracking NDC progress. The primary indicator for tracking progress in achieving the NDC targets of the Kyrgyz Republic is the net emissions indicator, in line with the IPCC reporting guidelines. This indicator directly measures the volume of greenhouse gas emissions released into the atmosphere, taking into account removals, thereby providing a quantitative metric for assessing the efforts of the Kyrgyz Republic to reduce its climate impact.

In 2021, at the time of preparing the Second NDC, according to the GHG inventory assessment for 1990–2017 presented in the First Biennial Update Report, the net greenhouse gas emissions in the base year 1990 amounted to 18,027.24 kt $CO_2$ eq., while in 2017 they stood at 5,500.73 kt $CO_2$ eq.

The projection of total and net emissions for 2017–2030, as presented in the Second NDC (2021), is shown in Figure 0.1.

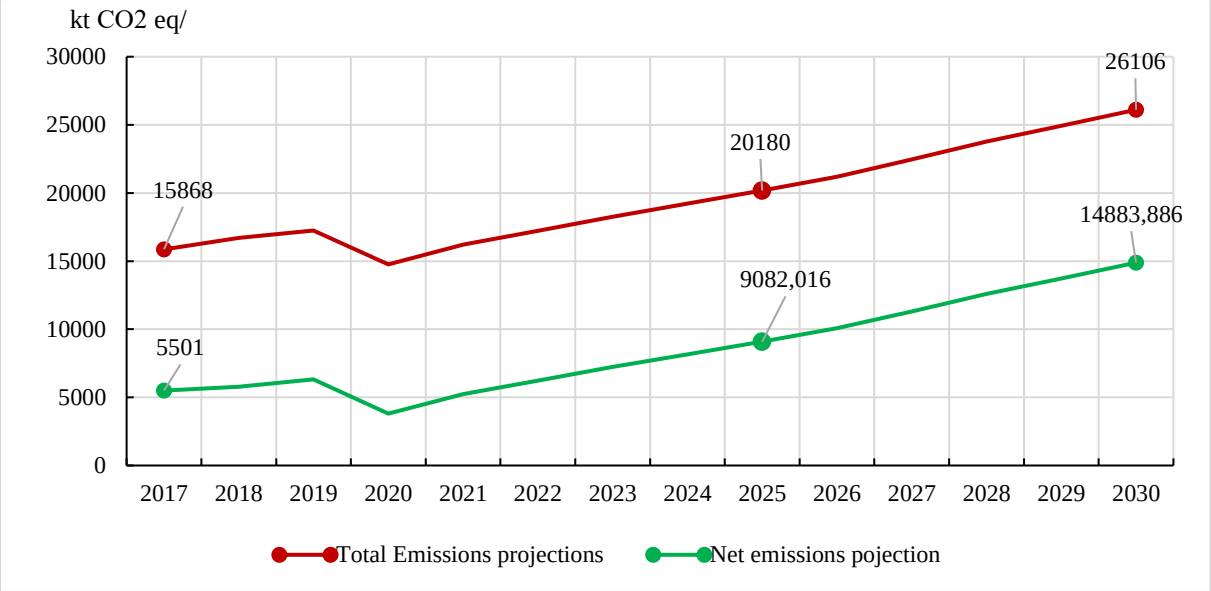



*Figure 0.1. Projection of total and net GHG emissions for the period 2017–2030.*

Progress in achieving activity targets and mitigation indicators is presented in the tables of the NDC Implementation Plan, which were included in the Annex to the NDC in 2021.[2] The progress in implementing each unconditional measure under the "with measures" scenario and each conditional measure under the "with additional measures" scenario is also presented in a descriptive form.

According to the calculated estimates for 2025, the total volume of GHG emission reductions relative to the 2023 net GHG emissions amounted to 1,481.661 kt $CO_2$ eq., or 16.3% of the 2023 net GHG emissions, which totaled 9,065.27 kt $CO_2$ eq. While 92% of these reductions were achieved through unconditional measures, and 8% were achieved through conditional measures (see Figure 0.3).

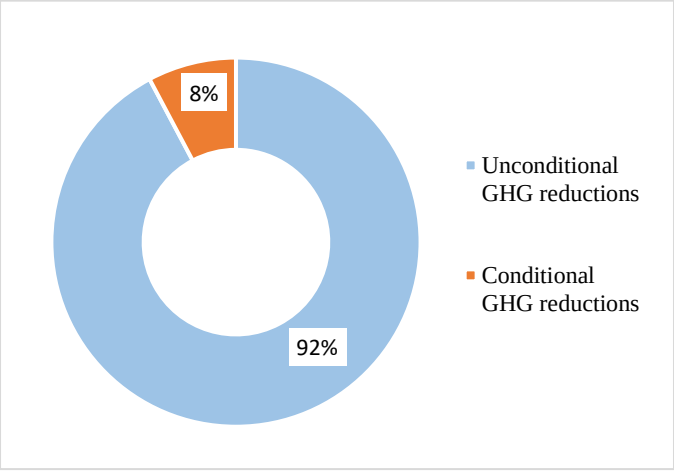



*Figure 0.2. Share of reductions by types of policies and measures*

At the same time, it should be noted that, following the recalculation of the time series for 1990–2023 carried out in 2025 within the framework of the GHG Inventory 1990–2023, using the new Global Warming Potential (GWP) values in accordance with the IPCC Fifth Assessment Report (AR 5), different annual values of net emissions were obtained. The comparison of these GHG emission values

[2] Сайт РКИК ООН: https://unfccc.int/sites/default/files/NDC/2022-06/%D0%9E%D0%9D%D0%A3%D0%92%20ENG%20%D0%BE%D1%82%2008102021.pdf

for 1990 and 2017, as well as the difference between the projections of emissions based on these data and the values obtained in the course of the GHG Inventory 1990–2023, is presented in Table 2.12.

The projection of total emissions (excluding LULUCF) and net emissions (including LULUCF) under the updated baseline scenario up to 2035 is presented in Figure 0.2.

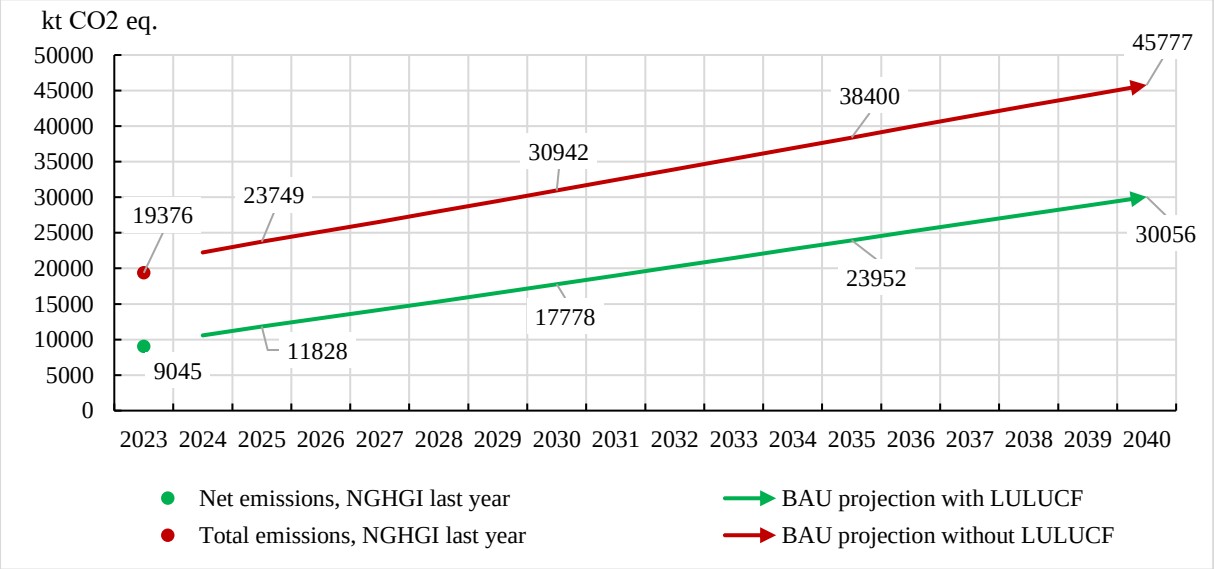



*Figure 0.3. Projections of total and net GHG emissions under the baseline scenario up to 2040*

# Chapter 3. Information related to climate change impacts and adaptation under Article 7 of the Paris Agreement

Chapter 3 is devoted to presenting information on the impacts of climate change and the adaptation of the Kyrgyz Republic to these impacts. It provides information on national circumstances, institutional arrangements and legal frameworks for the planning, implementation, monitoring and analysis of adaptation actions.

The chapter also describes the current climate changes and the projections of future climate change in terms of the main factors.

As a result of climate change modeling, it was determined that temperature consistently increases under both scenarios applied, which remain almost indistinguishable until the mid-2030s. Thereafter, the trajectories diverge, and by the end of the 21st century the temperature increase reaches nearly 7°C under the high-emission scenario SSP5-8.5, while under the moderate scenario SSP2-4.5 it is approximately 3.5°C.

Precipitation also increases on an annual basis under both scenarios, though in a more complex pattern compared to temperature. Until around 2050, when the increase reaches approximately 50 mm, the differences between the scenarios remain small. Thereafter, the scenarios diverge, and by the end of the 21st century precipitation increase reaches 90–100 mm (about 25%) under the high-emission scenario SSP5-8.5, and more than 60 mm (about 15%) under the moderate scenario SSP2-4.5 (see Figure 0.4).

**ensemble of 32 models**

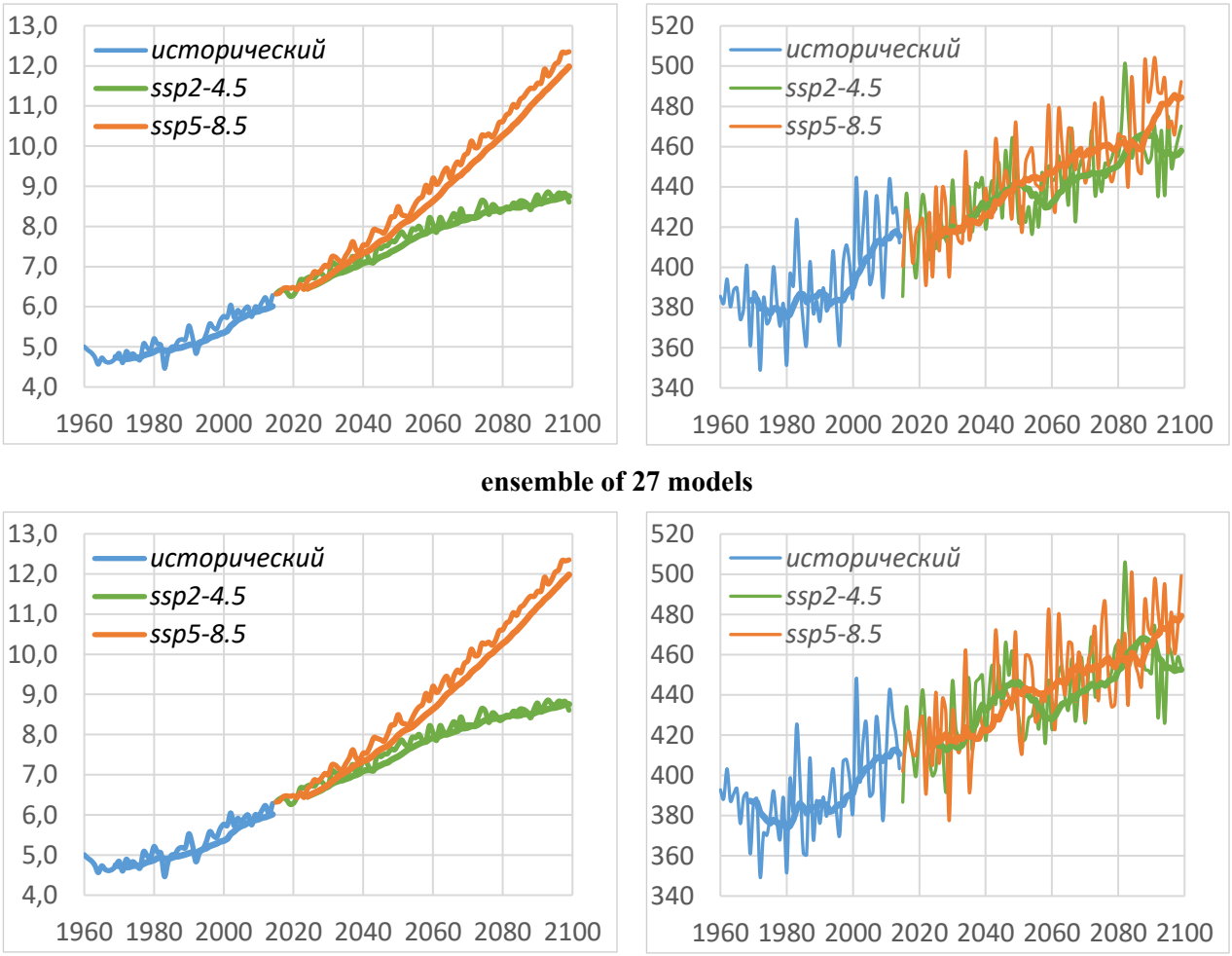



*Figure 0.4. Mean regional time series of deviations from the 1981–2000 norm of annual average air temperature (left) and annual precipitation (right) for two projection scenarios, based on two model ensembles, for the territory of the Kyrgyz Republic*

Chapter 3 also provides information on the assessment of climate impacts, risks and vulnerabilities. It further presents adaptation priorities and barriers, as well as the adaptation plans and actions developed, together with information on adaptation progress, monitoring and evaluation.

The chapter describes the impacts, risks and vulnerabilities to which various sectors of the Kyrgyz Republic are exposed, as well as the approaches and tools used for their assessment.

As a result of national adaptation planning, climate hazards were identified and ranked by risk level (in descending order of risk):

1. Heat waves
2. Low water availability (drought in water resources)
3. High solar radiation
4. High/Low atmospheric pressure
5. Atmospheric and soil drought
6. Floods and mudflows
7. Landslides
8. Meteorological drought
9. Avalanches
10. Wildfires

11. Heavy rainfall and hail
12. Frosts
13. Hurricane-force winds
14. Spring frosts

The chapter presents the adaptation priorities to climate change impacts that were identified in the Second NDC. These were formulated in line with the global goal on adaptation, aimed at enhancing adaptive capacity and climate resilience in the following sectors:

1. Water resources
2. Agriculture
3. Energy
4. Disaster risk reduction
5. Health
6. Transport infrastructure
7. Ecosystems and biodiversity
8. Climate-resilient territories and cities

In addition, the chapter presents information on four sectoral Adaptation Plans (APs) developed in the Kyrgyz Republic in 2023 in the areas of Health, Agriculture and Irrigation, Disaster Risk Reduction, and Biodiversity Conservation, as well as three Adaptation Plans for the regions most vulnerable to climate change: Batken, Jalal-Abad and Osh.

In addition, the chapter provides information on the prevention of losses and the addressing of damage caused by climate-induced natural disasters, as well as on the measures undertaken for their minimization and elimination. In conclusion, the chapter presents information on cooperation in the area of adaptation to climate change impacts.

## Chapter 4. Information on financial, technology development and transfer and capacity-building support needed and received under Articles 9–11 of the Paris Agreement

Chapter 4 is devoted to the financial, technological and capacity-building support needed and received by the Kyrgyz Republic for climate action. It describes the national circumstances, institutional arrangements and strategies applied by the Kyrgyz Republic to identify these types of support needs.

This section presents the basic assumptions, definitions and methodologies for identifying needs and mobilizing resources for climate action.

In addition, the chapter presents information on the support needed and received, including all forms of financial assistance, support for technology development and transfer, as well as measures for capacity-building. It also provides information on support related to transparency, including activities aimed at strengthening capacity for the transparency of climate actions of the Kyrgyz Republic.

In this BTR1, the definitions and assumptions applied are aligned with the UNFCCC guidance documents**.** In presenting information on climate finance, consideration was given to mitigation measures, adaptation measures, as well as cross-cutting (integrated) measures that simultaneously address both adaptation and mitigation. Financial flows are classified by channels (bilateral, multilateral, regional) and by types of instruments (grants, concessional and non-concessional loans).

The country has identified priority sectors and the indicative volume of resources required to achieve the mitigation and adaptation targets set out in its NDC. The total need for climate finance up to 2030 has been estimated at USD 10.1 billion, of which a significant share is expected to be provided from international sources, given the limited availability of domestic resources.

During the period 2017–2024, the Kyrgyz Republic received significant international climate support for the implementation of measures on climate change adaptation and greenhouse gas emission reduction. The total amount of funds received amounted to USD 1,312.7 million. The dynamics of inflows reflect a steady increase, reaching a peak in 2023 (see Figure 0.4).

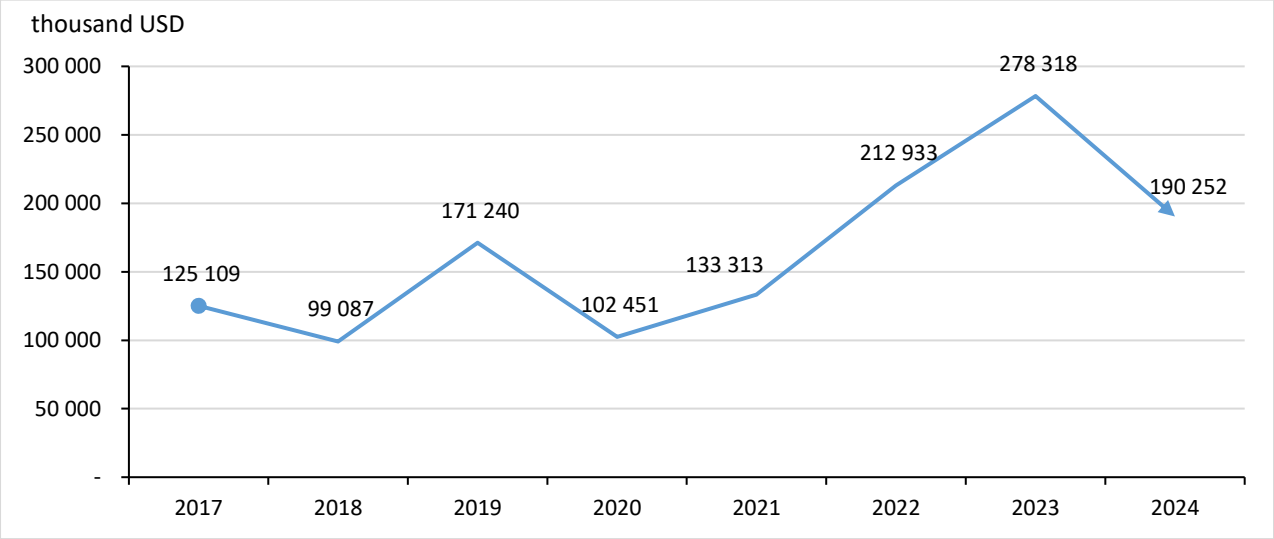
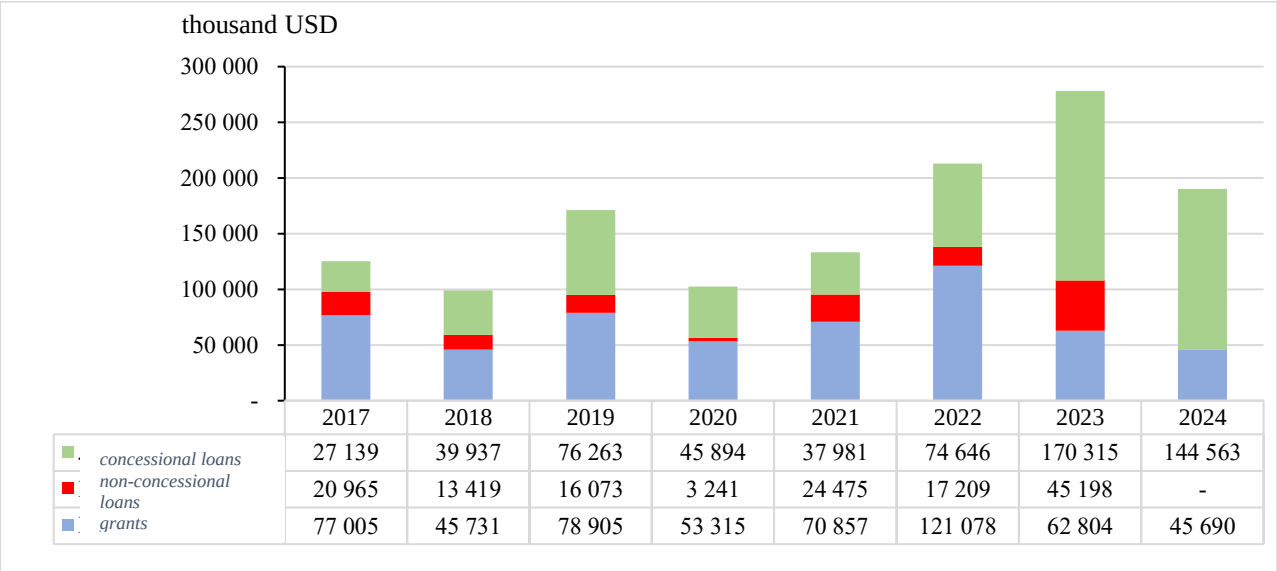



*Figure 0.5.Dynamics of international support to the Kyrgyz Republic for the period 2017–2024.*

In 2022–2023, the highest inflows were recorded, primarily driven by the mobilization of large concessional loans from multilateral banks for the implementation of infrastructure projects, accompanied by a notable increase in grant contributions. By contrast, the share of non-concessional loans remained negligible throughout the years, indicating minimal reliance on commercial credit. These dynamics demonstrate that the growth of climate support was achieved mainly through the expansion of concessional lending and associated grants, which enabled the scaling up of investments in climate projects without increasing the burden of costly borrowing, as well as through grant financing provided by dedicated climate funds and development partners (see Figure 0.5).




| | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|---|---|---|
| *concessional loans* | 27 139 | 39 937 | 76 263 | 45 894 | 37 981 | 74 646 | 170 315 | 144 563 |
| *non-concessional loans* | 20 965 | 13 419 | 16 073 | 3 241 | 24 475 | 17 209 | 45 198 | - |
| *grants* | 77 005 | 45 731 | 78 905 | 53 315 | 70 857 | 121 078 | 62 804 | 45 690 |

*Figure 0.6. Dynamics of climate finance by financial instruments*[3]

[3] Prepared on the basis of OECD data for the period 2017–2023 and IATI data for 2024.

When examining the sources of international support by financing channels (see Figure 0.5), it can be noted that multilateral sources dominate: around 85% of all inflows were provided through multilateral development banks, funds and programmes, while the contribution of bilateral assistance from individual countries accounted for about 15%. In other words, the bulk of climate resources received by the Kyrgyz Republic comes through international financial institutions and global climate funds.

In the framework of the Technology Needs Assessment (TNA) conducted for the Kyrgyz Republic, the analysis also identified a set of cross-cutting barriers to the large-scale deployment of climate technologies. These include the absence of investment incentives, a shortage of qualified professionals, low awareness among beneficiaries, and weak coordination among stakeholders.

To address these barriers, the Technology Action Plan put forward a set of recommendations, including the implementation of training programmes, the development of a regulatory framework, the creation of favourable financing conditions, and the expansion of access to international technical assistance.

Thus, the Kyrgyz Republic has identified priority areas for technological support to achieve its climate goals and relies on further cooperation for their implementation under Article 10 of the Paris Agreement.

A number of internationally supported projects have provided the Kyrgyz Republic with access to modern technologies for climate change mitigation and adaptation. The implementation of these projects contributes to the technological modernization of the economy — from improving water resources and agricultural management to the development of renewable energy and the introduction of digital climate monitoring systems.

Chapter 4 presents the key capacity-building needs, grouped under the following areas:

1. Human capacity development
2. Institutional development and coordination
3. Technical and digital support
4. Local-level engagement and stakeholder participation

To achieve sustainable progress in implementing the Paris Agreement, the Kyrgyz Republic requires comprehensive capacity-building support, with a primary focus on the systematic development of competencies, the establishment of resilient institutions, and the digitalization of climate governance.

The capacity-building support received by the Kyrgyz Republic has significantly strengthened national capacities for the implementation of climate policy. As a result of these activities, human resources have been considerably improved: specialists have been trained in GHG inventory preparation, climate modeling, and the development of projects for climate funds. However, limitations remain with regard to qualifications in state and municipal authorities, and the mechanism for knowledge transfer is not yet sufficiently sustainable.

The Kyrgyz Republic, as a developing country, is actively working to establish a sustainable national transparency system in accordance with Article 13 of the Paris Agreement. To meet the enhanced transparency requirements, the country receives international support and has identified key needs in the areas of monitoring, reporting and verification of mitigation actions(MRV), capacity-building, and institutional development. It should also be noted that the Kyrgyz Republic requires additional support for strengthening capacities related to the monitoring and evaluation (M&E) of adaptation actions, both at the institutional and human resource levels.

The Kyrgyz Republic has successfully submitted its BUR1, NC4, and the respective National GHG Inventory Reports, prepared its BTR1, and developed Adaptation Plans for priority sectors with the support of the international community. In this regard, the continuation of support for enhancing transparency — particularly in relation to regulatory reforms, strengthening human capacity, technology

transfer, and financing — remains critically important for the full implementation of the obligations under Article 13 of the Paris Agreement.

# Introduction

## The Kyrgyz Republic and the United Nations Framework Convention on Climate Change (UNFCCC)

The Kyrgyz Republic acceded to the United Nations Framework Convention on Climate Change (UNFCCC) in 2000, in accordance with the Law on Accession of the Kyrgyz Republic to the UNFCCC of 9 May 1992.[4] Pursuant to Article 4, paragraph 1(a) on the commitments of Parties and Article 12, paragraph 1(a) on the provision of information relating to the implementation of the Convention, the Kyrgyz Republic has regularly submitted its National Reports to the Conference of the Parties.

Representatives of the relevant state authorities of the Kyrgyz Republic, as well as civil society organizations, participate on an ongoing basis in the sessions of the Conference of the Parties to the UNFCCC.

The third session of the Conference of the Parties (COP 3) held in Kyoto in 1997 adopted the Kyoto Protocol, which constitutes a legally binding instrument setting mandatory targets for the Parties to the Convention through the commitments of industrialized countries and countries with economies in transition, listed in Annex I to the Convention, to reduce their aggregate emissions of direct greenhouse gases by at least 5% compared to the 1990 level over the five-year period 2008–2012. The Kyrgyz Republic ratified the Kyoto Protocol by the Law of the Kyrgyz Republic of 15 January 2003.[5]

Prior to the adoption and implementation of the Paris Agreement, the main mechanism for providing information on a country's activities under the UNFCCC consisted of National Communications (NCs) and Biennial Update Reports (BURs). The guidelines for the preparation of national communications from non-Annex I Parties were adopted by the Conference of the Parties in 1996 in Geneva (Decision 10/CP.2). COP 8 (Delhi, 2002) adopted new guidelines for the national communications of non-Annex I Parties to the Convention (Decision 17/CP.8).

In accordance with these guidelines, within the framework of the UNDP project *"*Assistance to Kyrgyzstan in Preparing the First National Communication", and with the financial support of the GEF, the Kyrgyz Republic submitted its First National Communication in 2003, including the national inventory of greenhouse gas emissions and removals for the period 1990–2000. This document was approved by Government Decree of the Kyrgyz Republic No. 200 of 10 April 2003.

In 2009, the Second National Communication of the Kyrgyz Republic to the UNFCCC was prepared and submitted to the Convention Secretariat, including the national greenhouse gas inventory for 1990–2005, under a UNDP project with financial support from the GEF. The Second National Communication was approved by Government Decree of the Kyrgyz Republic No. 274 of 6 May 2009 and submitted to the UNFCCC.

On 18 January 2010, the Kyrgyz Republic signed the Copenhagen Accord (COP 15, Copenhagen, Denmark). In 2013, in accordance with paragraph 5 of the Accord, Kyrgyzstan submitted information on its quantified emission reduction target — a 20% reduction of GHG emissions by 2020 compared to the 1990 base year, subject to adequate support.[6]

[4] Law of the Kyrgyz Republic "On Accession of the Kyrgyz Republic to the United Nations Framework Convention on Climate Change (UNFCCC) and the UNECE Convention on Long-range Transboundary Air Pollution" of 14 January 2000.

[5] Law of the Kyrgyz Republic "On Ratification of the Kyoto Protocol to the United Nations Framework Convention on Climate Change" of 15 January 2003.

[6] Letter of the National Authorized Body (State Agency for Environmental Protection and Forestry under the Government of the Kyrgyz Republic) to the Secretariat of the Convention, dated 26 April 2013, No. 07-01-28/1233.

It should be noted that in 2020 the Kyrgyz Republic exceeded its commitment under the Copenhagen Accord, as the country's total GHG emissions were 40% below the 1990 level.

With the support of a GEF/UNEP project, the Kyrgyz Republic prepared its Third National Communication, including the national GHG inventory for the period 1990–2010, and submitted it to the UNFCCC Secretariat in 2016. This document was approved by Government Decree No. 546 of 13 October 2016.

The 21st session of the Conference of the Parties to the United Nations Framework Convention on Climate Change was held from 30 November to 12 December 2015 in Le Bourget, France, resulting in the adoption of the Paris Agreement as a comprehensive and legally binding international treaty.

The Agreement is designed to strengthen the global response to the threat of climate change through three overarching objectives: (1) holding the increase in the global average temperature, (2) enhancing adaptive capacity to the adverse impacts of climate change, and (3) aligning financial flows with a pathway towards low-emission development. The Agreement entered into force on 4 November 2016.

At the opening of COP 21, the President of the Kyrgyz Republic highlighted the threat posed by climate change to glaciers, outlined the integration of climate action into national development policies, and emphasized the need for adequate and equitable consideration of the interests of developing countries in shaping future global action. The country's mitigation commitments under the Copenhagen Accord were reaffirmed.

The Paris Agreement, on behalf of the Kyrgyz Republic, was signed by the Minister of Foreign Affairs at the 71st session of the United Nations General Assembly in New York on 24 September 2016 and was ratified by the Parliament on 12 November 2019.[7] Following ratification, the intended NDC was formally registered in 2020 as the First NDC of the Kyrgyz Republic.

On 29 September 2015, the Intended Nationally Determined Contribution (INDC) of the Kyrgyz Republic was submitted by means of a Note Verbale from the Ministry of Foreign Affairs of the Kyrgyz Republic, for the purpose of facilitating clarity, transparency, and understanding, pursuant to Decisions 1/CP.19 and 1/CP.20. As specified in the INDC, and according to the first NDC[8] the Kyrgyz Republic set an unconditional target, to be achieved through domestic resources, of reducing greenhouse gas (GHG) emissions by 11.49–13.75% below the business-as-usual (BAU) scenario level by 2030, and by 12.67–15.69% by 2050. Furthermore, conditional on the provision of international support, the Kyrgyz Republic expressed its readiness to reduce GHG emissions by 29.00–30.89% below the BAU scenario by 2030, and by 35.06–36.75% by 2050.

In 2021, the Kyrgyz Republic submitted its updated NDC, containing both mitigation and adaptation targets. With respect to mitigation, the level of ambition was enhanced, and the new NDC targets were set at an unconditional reduction of GHG emissions by 16.63% by 2025 and by 15.97% by 2030 compared to the business-as-usual (BAU) scenario. Subject to international support, GHG emissions are to be reduced by 36.61% by 2025 and by 43.62% by 2030 relative to the BAU scenario. The adaptation targets set by the Kyrgyz Republic in its Second NDC are fully consistent with the global goal on adaptation under Article 7 of the Paris Agreement.

At COP 26 in Glasgow (United Kingdom, 31 October – 12 November 2021), the Parties adopted the Glasgow Climate Pact, a package of decisions aimed at stepping up efforts to enhance climate resilience, limit greenhouse gas emissions, and ensure the provision of the necessary finance to address both objectives.

[7] Law of the Kyrgyz Republic "On Ratification of the Paris Agreement to the United Nations Framework Convention on Climate Change, signed on 12 December 2015 in Paris" of 12 November 2019.
[8] After ratification, these are referred to as the Nationally Determined Contributions (NDCs).

At this Conference, the President of the Kyrgyz Republic stated that by 2050 Kyrgyzstan, on the platform of green development, would seek to achieve carbon neutrality. The driving force of this carbon-free policy will be renewable energy sources, primarily hydropower. He also emphasized that for Kyrgyzstan it is critically important to preserve its age-old glaciers, water resources and majestic mountains not only from the impacts of climate change but also from unsustainable economic activities. Therefore, adaptation programmes and projects will be implemented in such vulnerable sectors as agriculture, water resources, energy, emergency situations, public health and biodiversity.

The First Biennial Update Report (BUR1) of the Kyrgyz Republic was submitted to the UNFCCC in 2022. The report was prepared in accordance with the "UNFCCC biennial update reporting guidelines for non-Annex I Parties" (Annex III to Decision 2/CP.17), adopted by the 17th session of the Conference of the Parties to the UNFCCC.

Together with BUR1, Kyrgyzstan also submitted, as a separate document, its National GHG Inventory Report for the period 1990–2018. In 2023, for the first time, this national climate reporting document underwent the UNFCCC International Consultation and Analysis (ICA) process, which identified possible improvements in the preparation of climate reporting, as well as areas for strengthening national technical capacity on GHG inventories, mitigation measures and reporting on support.

The next important step in advancing the global climate change agenda was the conduct of the first Global Stocktake under the Paris Agreement (COP 28, Dubai, United Arab Emirates, 2023), where negotiators from nearly 200 countries agreed to step up climate action before the end of the decade, with the overarching goal of limiting the increase in global temperature to 1.5°C above pre-industrial levels.

In his statement at COP 28, the President of the Kyrgyz Republic emphasized that Kyrgyzstan has, for more than twenty years, consistently promoted the integration of the mountain agenda into international negotiations at all levels. He also underlined that by 2050, on the platform of green development, Kyrgyzstan aims to achieve carbon neutrality and counts on the support of international partners to realize the country's significant hydropower potential.

He also called on developed countries, in line with the spirit of the Paris Agreement, to provide more active support to vulnerable developing mountain countries, including through the prompt operationalization of the Loss and Damage Fund, the provision of direct financial support and technology transfer, as well as the establishment of mechanisms for debt-for-climate swaps.

At the subsequent session (COP 29, Baku, Azerbaijan, 11–22 November 2024), the main item on the agenda was the agreement on a new climate finance regime and support for developing countries. Among the outcomes of COP 29 were the adoption of climate finance goals, the rules for the functioning of the international carbon market, and the establishment of a global goal on the deployment of energy storage systems.

In his statement at COP 29, the President of the Kyrgyz Republic also called for coordinated and financially supported measures to ensure the implementation of the Paris Agreement. He proposed a mechanism for debt-for-sustainable development swaps and initiated the establishment of a climate trust fund. The President underlined the importance of renewable energy sources, highlighted hydropower and solar power projects, and drew attention to glacier melt and the associated threats to water resources. He also called on international partners to support initiatives for sustainable adaptive development of mountain regions.

In 2024, the Fourth National Communication of the Kyrgyz Republic to the UNFCCC was endorsed at a meeting of the Coordinating Council on Climate Change, Environment and Sustainable Development of the Cabinet of Ministers, chaired by the Prime Minister, and was submitted to the Convention Secretariat. Together with NC4, the National GHG Inventory Report for the period 1990–2020 was also submitted.

## Institutional arrangments for BTR1 preparation

In accordance with the Law of the Kyrgyz Republic "On State Regulation and Policy in the Field of Greenhouse Gas Emissions and Removals" of 25 May 2007 No. 71,[9] the state authority responsible for the UNFCCC is the Ministry of Natural Resources, Ecology and Technical Supervision of the Kyrgyz Republic. In addition to maintaining the national GHG inventory, the Ministry is also responsible for preparing all climate reporting documents of the Kyrgyz Republic.

For the overall coordination of the processes related to the preparation of national climate policy documents and to ensure the engagement of all stakeholders, a Coordinating Council on Climate Change, Environment and Sustainable Development has been established under the Cabinet of Ministers of the Kyrgyz Republic, chaired by the Prime Minister.

To date, as described above, the Kyrgyz Republic has submitted to the Convention Four National Communications and one BUR, receiving international support from the financial mechanism of the UNFCCC. The Global Environment Facility has provided financial resources to Kyrgyzstan through its partner organizations UNDP and UNEP, which acted as the implementing agencies for these projects. The executing entities for the projects were the national authorities responsible for the UNFCCC, which oversaw the preparation of the respective climate reporting documents of the Kyrgyz Republic.

The preparation of the current set of climate reporting documents of the Kyrgyz Republic includes three reports and is likewise being carried out with the support of the GEF–UNEP–UNDP project "Support to Kyrgyzstan for the preparation and submission of the Biennial Transparency Reports (BTR1 and BTR2) and the Fifth National Communication (NC5) in accordance with the requirements of the UNFCCC and the Paris Agreement (PA)." BTR1 is the first of these reports.

Following a tender process, the services for the preparation of BTR1 were provided by the Aarhus Centre in Bishkek, which, acting as a service provider, established a Technical Expert Group consisting of experts with the necessary knowledge and experience in the preparation of national climate reporting documents in accordance with the decisions of the Conference of the Parties to the UNFCCC and the Paris Agreement.

A wide range of governmental, municipal and private organizations, as well as civil society organizations, were engaged in the preparation of BTR1. As the lead agency, the Ministry of Natural Resources, Ecology and Technical Supervision organized the collection of the necessary information and data from all relevant data holders (see Figure 0.1). The provision of information and data for BTR1 was initiated through official information request letters. MNRETS also facilitated the involvement of relevant line ministries and agencies in conducting national consultations, workshops and discussions on the outputs of each stage of the preparation of the GHG inventory, progress in achieving the NDC, climate impacts and adaptation, and support needed and received, as part of the quality assurance process for the preparation of BTR 1.

Furthermore, to ensure broader stakeholder engagement, by official request of MNRETS, the involved organizations nominated their specialists to the Inter-Agency Working Group (IAWG). The IAWG cooperated with the Aarhus Centre's Technical Expert Group to ensure quality at all stages of preparing the sectoral chapters and sections, as well as for the validation of draft and final documents.

UNDP facilitated the engagement of an international expert in the preparation of BTR1 to provide advisory support to the national Technical Expert Group (TEG) of the Aarhus Centre in implementing the provisions contained in the UNFCCC Modalities, Procedures and Guidelines (MPGs). These

[9] Law of the Kyrgyz Republic "On State Regulation and Policy in the Field of Emissions and Absorption of Greenhouse Gases" of 25 May 2007, No. 71.

MPGs form part of the Katowice Climate Package, adopted at COP 24 (2018, Katowice, Poland), [10] as the fundamental UNFCCC guidance under the enhanced transparency framework for the preparation of national greenhouse gas inventories (NGHGI), as well as the Common Reporting Tables (CRT) for the National Inventory Document (NID) and the Common Tabular Format (CTF) tables on progress in achieving NDC targets, and on support needed and received. In addition, assistance was provided for uploading the completed reporting tables to the UNFCCC online reporting tool on the Convention portal.

In the course of preparing BTR1, the TEG of the Aarhus Centre identified and formulated information needs, while MNRETS sent official information request letters to the relevant ministries and agencies (see Figure 0.1 below), carried out the collection and preliminary processing of data, and performed the GHG emission calculations, as well as the compilation of the NID and CRT for 1990–2023. The TEG of the Aarhus Centre was also responsible for completing the CTF tables on NDC progress, collecting materials on climate change impacts and adaptation, and on support needed and received, and for preparing the corresponding chapters of BTR1.

[10] UNFCCC website: https://unfccc.int/ru/katowice

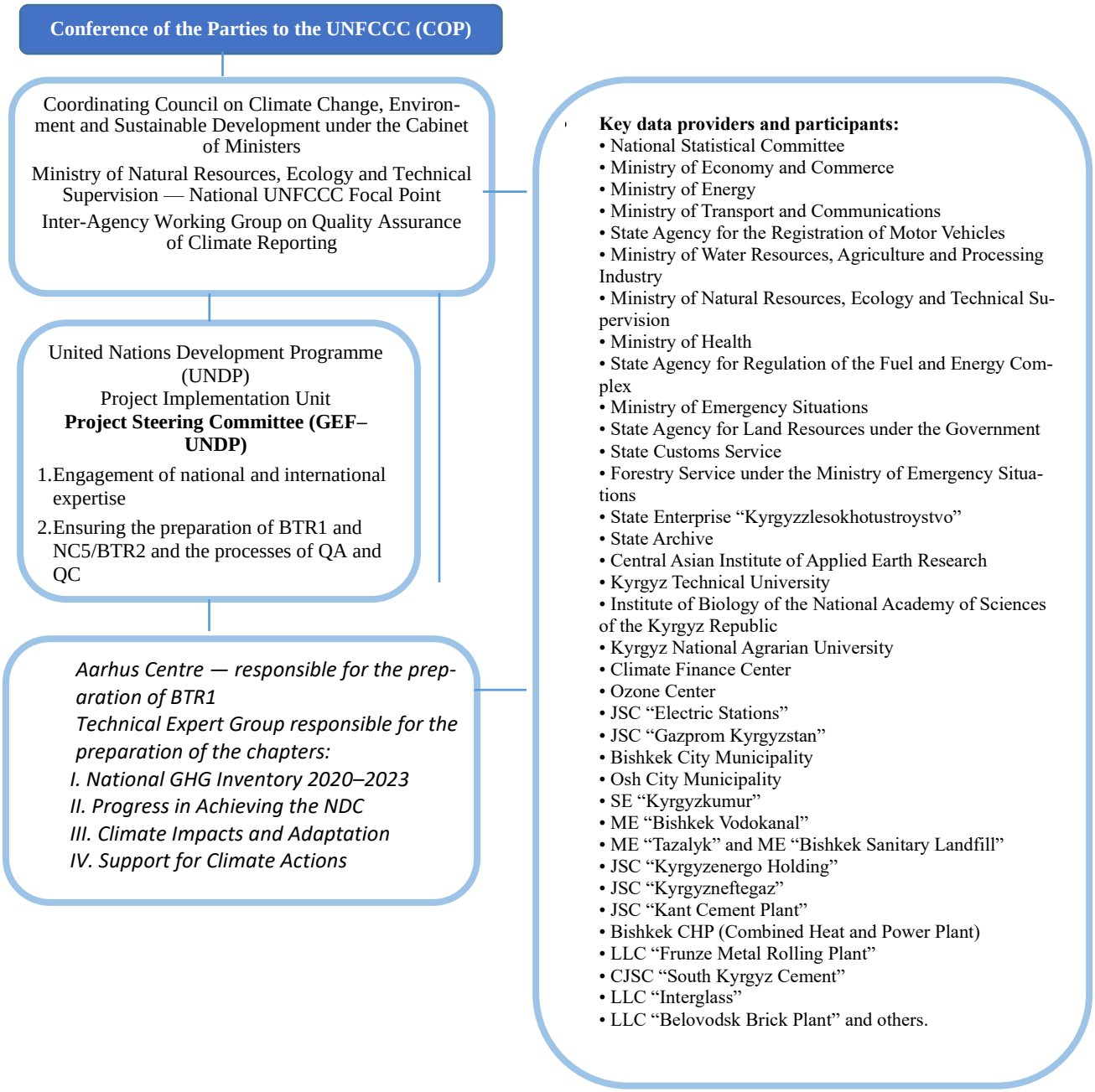



*Figure 0.1. Institutional arrangements for the preparation of the First Biennial Transparency Report (BTR1)*

A more detailed description of the national institutional mechanisms for conducting the National Greenhouse Gas Inventory is provided in Chapter I. The institutional arrangements for tracking progress on the NDC are presented in Chapter II. The institutional organization of adaptation actions is described in Chapter III. Information on the institutional arrangements for identifying support needed and received (financial, technological and capacity-building) is presented in Chapter IV.

# 1. Information on anthropogenic GHG emissions by sources and removals by sinks

## 1.1 Introduction

The First Biennial Transparency Report of the Kyrgyz Republic was prepared in accordance with Article 13 of the Paris Agreement and with the decisions adopted at the first session of the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA), in particular Decision 18/CMA. 11 The report was prepared in line with the Modalities, Procedures and Guidelines (MPGs) under the enhanced transparency framework for action and support referred to in Article 13 of the Paris Agreement, as set out in the Annex to the above-mentioned Decision 18/CMA.1. In addition, BTR1 of the Kyrgyz Republic follows the Guidance for operationalizing the MPGs for the enhanced transparency framework referred to in Article 13 of the Paris Agreement (Decision 5/CMA.3).[12]

As a Party to the United Nations Framework Convention on Climate Change and the Paris Agreement, the Kyrgyz Republic has undertaken the commitment to develop, update and provide national greenhouse gas inventories of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol.
In accordance with Decision 18/CMA.1 and Decision 5/CMA.3 (paragraph 20), the GHG inventory estimates of Kyrgyzstan for 2025, covering the period 1990–2023, were compiled in line with the 2006 IPCC Guidelines for National Greenhouse Gas Inventories [13] (hereinafter referred to as the 2006 IPCC Guidelines). Detailed information on the submission of the 2025 GHG inventory is provided in the Common Reporting Tables (CRTs), which are submitted electronically together with the National Inventory Document.

This chapter contains a summary of the GHG inventory, based on the National Greenhouse Gas Inventory Report of the Kyrgyz Republic for 1990–2023, which is submitted as a separate National Inventory Document, together with the Common Reporting Tables (CRTs), providing a comprehensive assessment of emissions and removals in the following sectors:

- Energy
- Industrial Processes and Product Use
- Agriculture
- Land Use, Land-Use Change and Forestry (LULUCF)
- Waste

The full text of the National Inventory Document of the Kyrgyz Republic will be submitted as a separate document, in accordance with paragraph 12 of the MPGs.

The NID includes data on six direct greenhouse gases: carbon dioxide ($CO_2$), methane ($CH_4$), nitrous oxide ($N_2O$), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride ($SF_6$).[14]. In addition, for certain source categories, emissions of four pollutants classified as indirect GHGs were estimated: carbon monoxide (CO), nitrogen oxides ($NO_x$), non-methane volatile organic compounds (NMVOCs) and sulphur dioxide ($SO_2$).

[11] UNFCCC website: https://unfccc.int/resource/tet/bg/bg1-01_decision_18_CMA.1.pdf
[12] UNFCCC website: https://unfccc.int/sites/default/files/resource/CMA2021_L10a2E.pdf
[13] IPCC website: https://www.ipcc-nggip.iges.or.jp/public/2006gl/index.html
[14] Emissions of nitrogen trifluoride ($NF_3$) are not observed in the Kyrgyz Republic due to the absence of relevant activities. Therefore, they are not included in the National Inventory Report on greenhouse gases.

Since GHGs differ in their radiative forcing and atmospheric lifetimes, the NID also provides estimates of emissions of each major GHG in carbon dioxide equivalents ($CO_2$ eq.), which enables comparison across gases and determination of the aggregate effect of multiple gases. In accordance with the requirements of the MPGs, the NID applies the Global Warming Potentials with a 100-year time horizon, as provided in Table 8.A.1 of Chapter 8: Anthropogenic and Natural Radiative Forcing of the Fifth Assessment Report of the IPCC (2014)[15].

The summary of the GHG inventory presented in this chapter provides the context for other chapters of the BTR and presents the relevant information in a concise format. A detailed summary and the full and comprehensive information on the GHG inventory are contained in the NID of the Kyrgyz Republic, which will be submitted to the UNFCCC in 2025, together with the corresponding CRTs. The summary table of GHG emissions and removals from the same document is presented in Chapter I of the BTR.

## 1.2 National circumstances and institutional arrangements for the preparation of the NGHGI

In Kyrgyzstan, the national inventory system — including institutional, legal and procedural arrangements for the continuous assessment, preparation and timely submission of national inventory reports in accordance with the UNFCCC Modalities, Procedures and Guidelines (MPGs) — is still in the process of development, reflecting national circumstances and the existing technical capacity.

The Ministry of Natural Resources, Ecology and Technical Supervision of the Kyrgyz Republic is the designated state authority for the UNFCCC and is responsible for conducting the national greenhouse gas inventory and maintaining the National GHG Inventory, engaging relevant national and international expertise. [16]

To date, the Kyrgyz Republic has undertaken four NGHGI cycles, receiving international support through the financial mechanism of the UNFCCC. The Global Environment Facility has provided financial resources to Kyrgyzstan through its partner organizations UNDP and UNEP, which acted as implementing agencies. The executing entities for these projects were the national authorities responsible for the UNFCCC, which oversaw the preparation of the relevant climate reporting documents of the Kyrgyz Republic.

As the NGHGI process and the compilation of the National GHG Inventory in Kyrgyzstan are implemented on a project basis, it involves the competitive recruitment of an inventory project team at the beginning of each NGHGI cycle.

The current fifth NGHGI cycle in Kyrgyzstan is being carried out with the support of the GEF–UNEP–UNDP project "Support to Kyrgyzstan for the preparation and submission of the Biennial Transparency Reports and the Fifth National Communication in accordance with the requirements of the UNFCCC and the Paris Agreement (PA)". This cycle will provide the relevant emissions and removals data for the preparation of BTR1, BTR2 and NC5.

For the fifth cycle of the NGHGI and the compilation of the National GHG Inventory, the Aarhus Centre was engaged through a competitive selection process.

For the overall coordination of the preparation of national climate policy documents and to ensure stakeholder engagement, a Coordinating Council on Climate Change, Environment and Sustainable Development has been established under the Cabinet of Ministers of the Kyrgyz Republic, chaired by

[15] IPCC website: https://www.ipcc.ch/site/assets/uploads/2018/02/SYR_AR5_FINAL_full_ru.pdf
[16] Law of the Kyrgyz Republic "On State Regulation and Policy in the Area of Greenhouse Gas Emissions and Removals" of 25 May 2007, No. 71

the Prime Minister. This body will review and endorse BTR1 and the National Inventory Report of the Kyrgyz Republic for submission to the UNFCCC Secretariat.

At present, the NGHGI system in Kyrgyzstan remains under development. The current system for GHG inventory is presented in Figure 1.1.

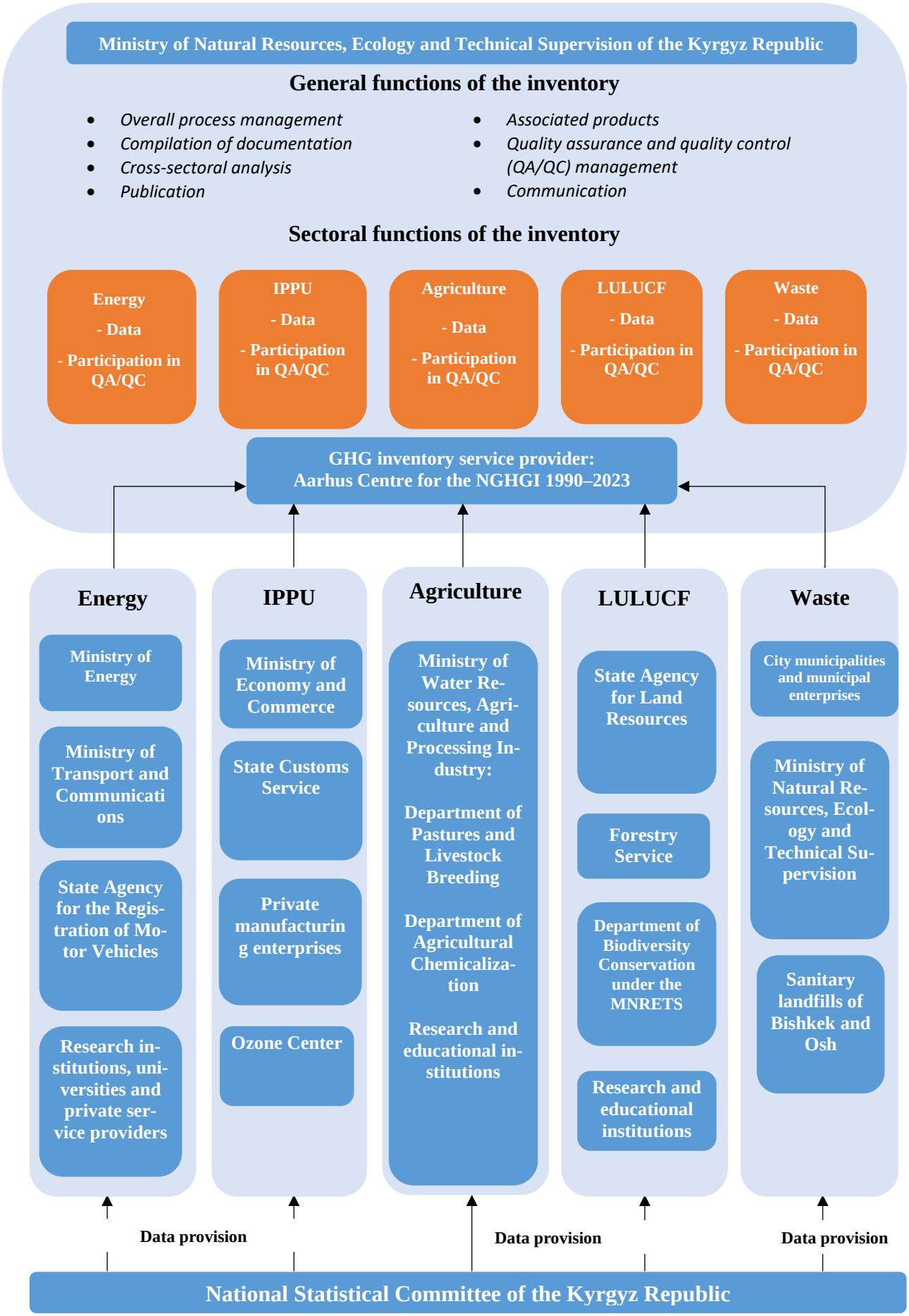

Ministry of Natural Resources, Ecology and Technical Supervision of the Kyrgyz Republic
General functions of the inventory
Overall process management
Compilation of documentation
Cross-sectoral analysis
Publication
Associated products
Quality assurance and quality control (QA/QC) management
Communication
Sectoral functions of the inventory
Energy
- Data
- Participation in QA/QC
IPPU
- Data
- Participation in QA/QC
Agriculture
- Data
- Participation in QA/QC
LULUCF
- Data
- Participation in QA/QC
Waste
- Data
- Participation in QA/QC
GHG inventory service provider:
Aarhus Centre for the NGHGI 1990–2023
Energy
Ministry of Energy
Ministry of Transport and Communications
State Agency for the Registration of Motor Vehicles
Research institutions, universities and private service providers
IPPU
Ministry of Economy and Commerce
State Customs Service
Private manufacturing enterprises
Ozone Center
Agriculture
Ministry of Water Resources, Agriculture and Processing Industry:
Department of Pastures and Livestock Breeding
Department of Agricultural Chemicalization
Research and educational institutions
LULUCF
State Agency for Land Resources
Forestry Service
Department of Biodiversity Conservation under the MNRETS
Research and educational institutions
Waste
City municipalities and municipal enterprises
Ministry of Natural Resources, Ecology and Technical Supervision
Sanitary landfills of Bishkek and Osh
Data provision
Data provision
Data provision
National Statistical Committee of the Kyrgyz Republic

*Figure 1.1. NGHGI system of the Kyrgyz Republic*

Table 1.1 below presents the division and allocation of specific roles among the institutions involved in the preparation of the inventory, to ensure that the collection of sufficient activity data, the selection and development of methods, emission factors and other parameters are consistent with the 2006 IPCC Guidelines and the UNFCCC MPGs.

*Table 1.1. Institutions involved in the current NGHGI and their roles*

| № | Institution | Role in the National Greenhouse Gas Inventory |
|---|---|---|
| ***1.*** | Coordinating Council on Climate Change, Environment and Sustainable Development under the Cabinet of Ministers | (1) Coordinates synergies among ministries and agencies for climate action;<br>(2) Approves strategic climate policy documents and national climate reporting documents |
| ***2.*** | Ministry of Natural Resources, Ecology and Technical Supervision | (1) Develops and implements national climate policy and legislation;<br>(2) UNFCCC Focal Point, responsible for climate reporting;<br>(3) Develops and implements the national monitoring, reporting and verification (MRV) system;<br>(4) Archives all information on submitted time series, including all disaggregated emission factors and activity data, and documentation on data compilation/aggregation, including QA/QC, verification results and planned inventory improvements;<br>(5) Organizes and participates in Technical Expert Review (TER) and Facilitative Multilateral Consideration of Progress (FMCP) |
| ***3.*** | Aarhus Centre in Bishkek | (1) Conducts the NGHGI: collection of activity data and parameters; processing and gap-filling; data normalization and compilation of long time series; methodology selection; GHG emission estimates; key category analysis; uncertainty analysis; completeness assessment; QA/QC planning and implementation;<br>(2) Compiles the GHG emissions and removals inventory by gases and sources, recalculated in $CO_2$ eq.;<br>(3) Validation of the GHG Inventory;<br>(4) Preparation of the National Inventory Report (NID) and Common Reporting Tables (CRTs);<br>(5) Uploading CRTs into the UNFCCC online reporting tool;<br>(6) Participation in TER and FMCP |
| ***4.*** | Ministry of Energy and its subdivisions | Data provider for the energy sector and fugitive emissions from fuels |
| ***5.*** | Ministry of Transport and Communications | Data provider for transport: aviation, railways, road and water transport |
| ***6.*** | Ministry of Economy and Commerce | Data provider for industry and product use |
| ***7.*** | Ministry of Water Resources, Agriculture and Processing Industry | Data provider for all land-use categories, agriculture and processing industry |
| ***8.*** | Ministry of Emergency Situations | Data provider for forest lands and removals |
| ***9.*** | Bishkek and Osh City Municipalities and their municipal enterprises | Data providers for solid waste management and wastewater |
| ***10.*** | National Statistical Committee of the Kyrgyz Republic (NSC KR) | Data provider for all NGHGI sectors: energy and transport, fuel and energy balance, industrial production, agriculture, land resources, forest resources, protected areas, water resources and water use, solid waste, wastewater |
| ***11.*** | State Customs Service under the Ministry of Finance | Data provider for imports of fuel and energy products and equipment containing F-gases |
| ***12.*** | State Agency for Architecture, Construction and Housing and Utilities | Data provider for residential buildings and energy consumption |
| ***13.*** | Private enterprises | Data providers for industrial production of glass, cement, bricks, iron and steel, lime |

| № | Institution | Role in the National Greenhouse Gas Inventory |
|---|---|---|
| ***14.*** | Research institutes and universities | (1) Data providers for IPPU, Transport, Agriculture and Forestry; (2) Participation in QA/QC of NGHGI results |

The process of conducting the current NGHGI is carried out under the overall leadership of the Ministry of Natural Resources, Ecology and Technical Supervision and with operational support from UNDP, which undertakes the procurement of services of national and international consultants and service providers required for project implementation.

For the preparation of BTR1, following a tender process, the Aarhus Centre was engaged and established a Technical Expert Group for conducting the NGHGI for the period 2021–2023, preparing the National GHG Inventory and recalculating the time series of emissions and removals for the period 1990–2023.

The stages of the NGHGI process and the preparation of the respective sections of the NID and CRTs, as well as the National Inventory Report on GHG emissions by sources and removals by sinks, are presented in Figure 1.2.

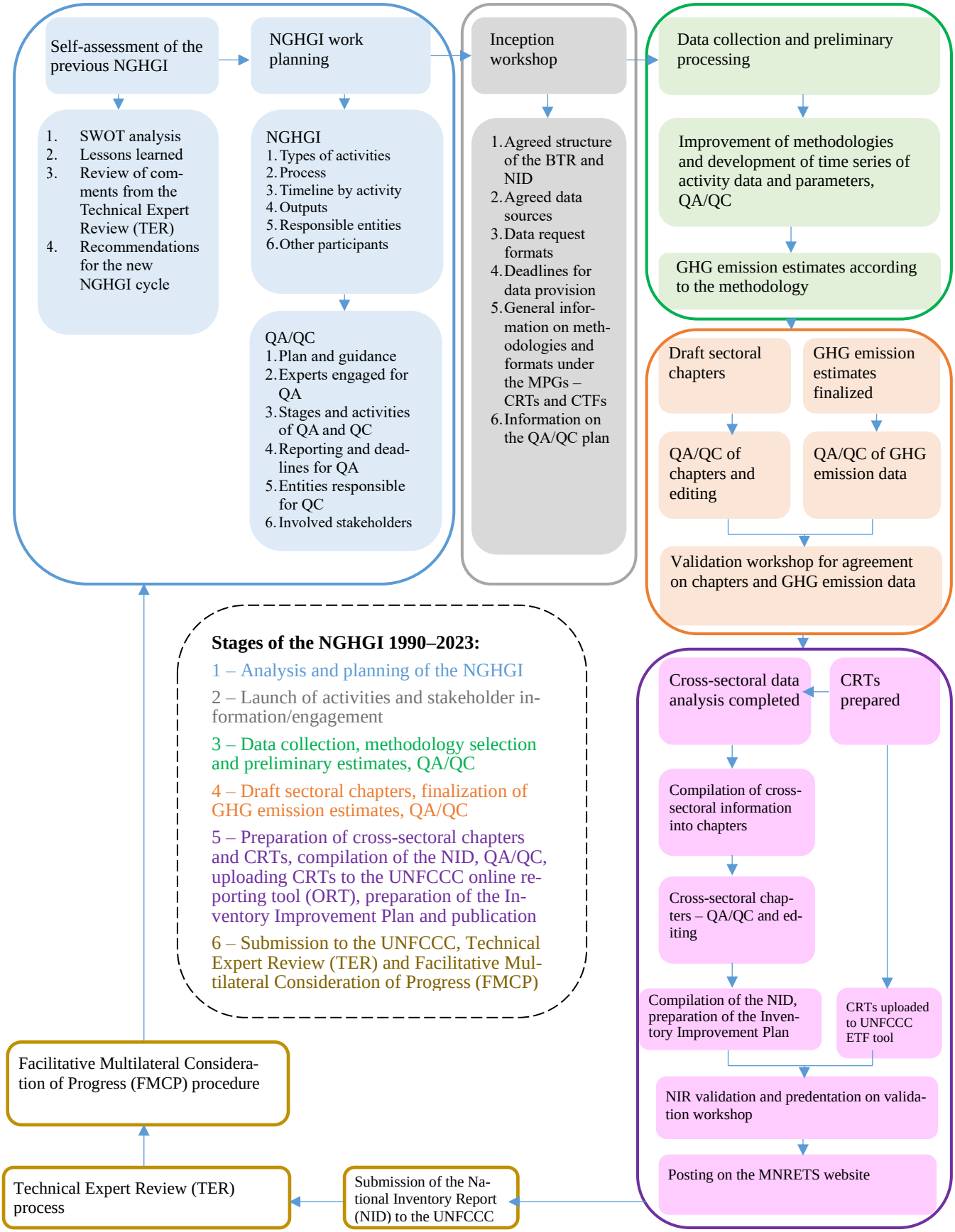



*Figure 1.2 Stages and activities for the preparation of the National Inventory Report (NID) on GHG emissions by sources and removals by sinks, carried out by the GHG inventory service provider*

# 1.3 Total national GHG emissions and removals

## 1.3.1 GHG emissions in 2023

### *1.3.1.1 Total GHG emissions in 2023*

In 2023, the total national greenhouse gas emissions of the Kyrgyz Republic reached 19,374.16 thousand tonnes of carbon dioxide equivalent (kt $CO_2$ eq.). The total emissions (excluding LULUCF) cover GHG emissions from the energy sector (including fugitive emissions), industrial processes and product use, agriculture and waste.

The total emissions of the Kyrgyz Republic by sector (excluding LULUCF) reflect the relative contribution of each sector to the national economy. In 2023, the energy sector accounted for 55% of total emissions in the Kyrgyz Republic. The agricultural sector contributed nearly 30% of gross national emissions, the IPPU sector accounted for 10.4%, and the waste sector for 5% of total emissions (see Figure 1.3).[17]

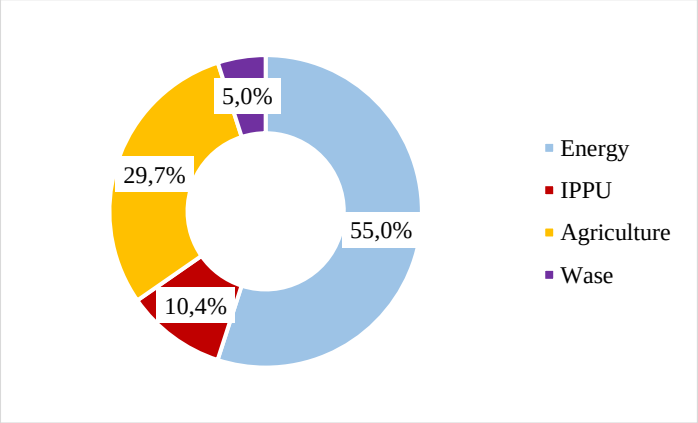



*Figure 1.3. Sectoral contributions to total GHG emissions in 2023, excluding LULUCF* [18]

The LULUCF sector currently represents a net sink of GHGs, with total removals in 2023 amounting to 10,308.89 kt $CO_2$. These removals offset 53% of the gross emissions of the Kyrgyz Republic in 2023, resulting in net emissions of 9,065.27 kt $CO_2$ eq.

The sectoral contributions including LULUCF are presented in Figure 1.4.

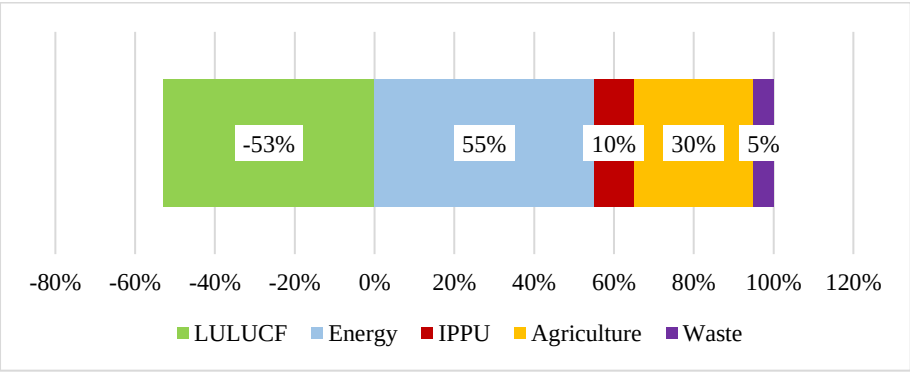



*Figure 1.4. Sectoral contributions to total GHG emissions in 2023, including LULUCF* [19]

[17] MNRETS. 2025. National Inventory Document for the period 1990–2023.
[18] Ibid.
[19] MNRETS. 2025. National Inventory Document for the period 1990–2023.

In 2023, more than half (58%) of the total greenhouse gas emissions of the Kyrgyz Republic (excluding LULUCF) consisted of carbon dioxide ($CO_2$), originating mainly from the Energy and IPPU sectors. Most of the remaining emissions were methane ($CH_4$) (29%) and nitrous oxide ($N_2O$) (10%), emitted primarily from the Energy, IPPU, Agriculture and Waste sectors. Emissions of hydrofluorocarbons (HFCs), occurring in the IPPU sector, accounted for 3% of total emissions (see Figure 1.5).

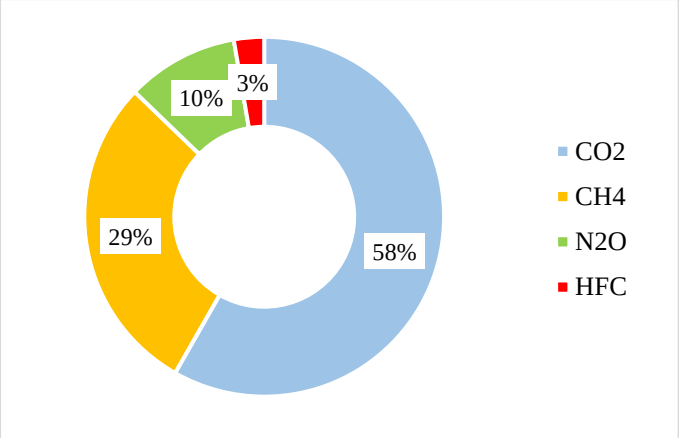



Figure *1.5*. GHG emissions by gas type[20]

### *1.3.1.2 Net GHG emissions in 2023*

In 2023, the net greenhouse gas emissions of the Kyrgyz Republic totaled 9,065.27 kt $CO_2$ eq. The total emissions including LULUCF cover GHG emissions from the Energy sector (including fugitive emissions), Industrial Processes and Product Use, Agriculture and Waste.

The net emissions of the Kyrgyz Republic by sector reflect the relative contribution of each sector to the national economy. In 2023, the Energy sector accounted for 36% of the total emissions of the Kyrgyz Republic. The agricultural sector contributed 19% of gross national emissions, the IPPU sector accounted for 7%, and the Waste sector for 3% (see Figure 1.6)[21]

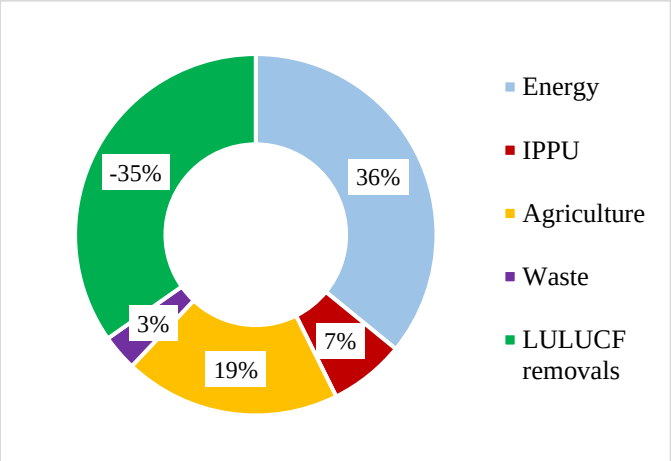



*Figure 1.6. Sectoral contributions to net GHG emissions in 2023, including LULUCF* [22]

[20] Ibid.
[21] MNRETS. 2025. National Inventory Document for the period 1990–2023.
[22] Ibid.

#### *1.3.1.3 Key categories*

A key category is defined as a category that is prioritized within the national inventory system because its estimation has a significant influence on the overall national greenhouse gas inventory in terms of absolute level, trend, or uncertainty of emissions and removals. Whenever the concept of a key category is applied, it covers both source and sink categories.[23] The concept of key categories is an important aspect of inventory preparation, as it helps to determine priorities in allocating resources for data collection and compilation, QA/QC and reporting.[24]

The key category analysis was conducted using Approach 1, in accordance with the methodology described in the 2006 IPCC Guidelines (section 4.3.1, chapter 4, volume 1).[25]

According to the results of the key category analysis, the largest contributions to total emissions in 2023 were from the following:

- Enteric fermentation ($CH_4$) – 19,5%;
- Road transportation – Liquid fuel ($CO_2$) – 16,0%;
- Energy industries – Solid fuel (CO2) – 10,3%;
- Other sectors – Solid fuel (CO2) – 8,8%;
- Cement production ($CO_2$) – 7,2%;
- Energy industries – Ligud fuels ($CO_2$) – 5,4%;
- Direct $N_2O$ emissions from managed soild ($N_2O$) – 4,5%;
- Manure management ($N_2O$) – 3,0%;
- Refrigeration and air conditioning (HFC) – 2,5%.

The main $CO_2$ sinks were the following:

- Forest land remaining forest land – 79.7% of total removals
- Cropland remaining cropland – 17.1%
- Grassland remaining grassland – 3.2%

A detailed description of the key category analysis results for 1990 and 2023 with and without LULUCF is provided in the NID (chapter 1 and annex 1).

### 1.3.2 Emission trends during the period 1990–2023

#### *1.3.2.1 Total emissions*

In 1990, the total greenhouse gas (GHG) emissions of the Kyrgyz Republic reached 27,764.91 kt $CO_2$ eq. During the period from 1990 to 2023, total GHG emissions in the Kyrgyz Republic decreased by 30.56%, reaching 19,374.16 kt $CO_2$ eq. in 2023. Table 1.2 presents GHG emissions in kilotonnes of $CO_2$ eq. by major sources for the time series 1990–2023, as well as for the NDC base year 2017.

*Table 1.2 GHG emissions of the Kyrgyz Republic in 1990 and 2023*

| Source | 1990 | 2017 | 2023 | Change 1990–2017 (kt $CO_2$ eq.) | Change 1990–2017 (%) | Change 1990–2023 (kt $CO_2$ eq.) | Change 1990–2023 (%) |
|---|---|---|---|---|---|---|---|
| Energy | 20,794.91 | 9,662.52 | 10,651.90 | -11,132.39 | -53.53 | -10,143.01 | -48.78 |
| IPPU | 871.64 | 1,299.16 | 2,008.04 | 427.52 | 49.05 | 1,136.40 | 130.38 |

[23] IPCC. 2006. 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Vol. 1, Ch. 4.
[24] EMEP/EEA air pollutant emission inventory guidebook 2023.Technical guidance to prepare national emission inventories.
[25] IPCC website: https://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/1_Volume1/V1_4_Ch4_MethodChoice.pdf

| Source | 1990 | 2017 | 2023 | Change 1990–2017 (kt $CO_2$ eq.) | Change 1990–2017 (%) | Change 1990–2023 (kt $CO_2$ eq.) | Change 1990–2023 (%) |
|---|---|---|---|---|---|---|---|
| Agriculture | 5,746.39 | 4,795.03 | 5,754.41 | -951.36 | -16.56 | 8.02 | 0.14 |
| Waste | 486.04 | 697.55 | 959.80 | 211.51 | 43.52 | 473,76 | 97.47 |
| Total emissions | 27,898.97 | 16,454.25 | 19,374.16 | -11,444.72 | -41.02 | -8,524.81 | -30.56 |
| LULUCF | -9,639.98 | -10,215.20 | -10,308.89 | -575.22 | 5.97 | -668.91 | 6.94 |
| Net emissions | 18,259.00 | 6,239.06 | 9,065.27 | -12,019.94 | -65.83 | -9,193.72 | -50.35 |

Table 1.3 below presents greenhouse gas emissions by gas type in kilotonnes of $CO_2$ eq. for the time series 1990–2023, as well as for the NDC base year 2017.

*Table 1.3. GHG emissions of the Kyrgyz Republic by gas in 1990, 2017 and 2023 (kt $CO_2$ eq.)*

| Gas | 1990 | 2017 | 2023 | Change 1990–2017 (kt $CO_2$ eq.) | Change 1990–2017 (%) | Change 1990–2023 (kt $CO_2$ eq.) | Change 1990–2023 (%) |
|---|---|---|---|---|---|---|---|
| **$CO_2$** | 20310,36 | 9915,82 | 11284,78 | -10394,54 | -51,18 | -9025,58 | -44,44 |
| **$CH_4$** | 5040,23 | 4678,39 | 5 611,58 | -361,84 | -7,18 | 571,35 | 11,34 |
| **$N_2O$** | 2548,39 | 1297,44 | 1 951,69 | -1250,94 | -49,09 | -596,70 | -23,41 |
| **HFC** | NO | 562,61 | 526,11 | 562,61 | - | 562,61 | - |
| **PFC** | NO | NO | NO | NA | NA | NA | NA |
| **$SF_6$** | NO | NO | NO | NA | NA | NA | NA |
| **Total (all gases)** | 27898,97 | 16454,25 | 19374,16 | -11444,72 | -41,02 | -8488,32 | -56,52 |

**Note:** $CH_4$ = methane; $CO_2$ = carbon dioxide; HFCs = hydrofluorocarbons; kt $CO_2$ eq. = kilotonnes of carbon dioxide equivalent; $N_2O$ = nitrous oxide; PFCs = perfluorocarbons; $SF_6$ = sulfur hexafluoride. Total emissions exclude net emissions from the LULUCF sector. Percentage change for HFCs is not applicable (NA), since no HFC emissions occurred in 1990 (NO). No emissions of PFCs or $SF_6$ occurred in either 1990 or 2023 (NO).

During the period 1990–2023, greenhouse gas emissions in the Kyrgyz Republic generally showed a declining trend. Total GHG emissions decreased by 30.56%, from 27,898.863 kt $CO_2$ eq. in 1990 to 19,374.16 kt $CO_2$ eq. in 2023. However, the distribution of these changes across individual sectors and historical periods was uneven.

This is primarily explained by the political and socio-economic transformation that took place in 1990–1991, when the Soviet Union collapsed and the Kyrgyz Republic became an independent state. The disruption of economic linkages and the cessation of centralized support plunged the country into a severe socio-economic crisis, from which Kyrgyzstan, even after 34 years, has not fully recovered.

In Soviet times, the Kyrgyz Republic was an industrial-agrarian republic that hosted major enterprises of the defense industry, instrument engineering, radio electronics, non-ferrous metallurgy, and light industry, many of which held the status of enterprises of all-Union significance.

The agro-industrial complex of Kyrgyzstan produced fine wool from local merino sheep (around one million head), which supplied not only the local worsted mill but also textile enterprises in central Russia, the Baltic republics and Europe.т

At the same time, all Central Asian republics were subsidized in the Soviet period. In 1991, subsidies from the Union center accounted for 44% of the budget of Tajikistan, 42% for Uzbekistan, 34% for

Kyrgyzstan, 23% for Kazakhstan and 22% for Turkmenistan[26] [27]. However, some experts argue that these figures were underestimated. For Kyrgyzstan, for instance, a subsidy level of 62.5% of the state budget is also cited[28].

The first years of independence (1991–1995/96) were marked by a sharp decline in GDP, industrial and agricultural output, reduced energy consumption, rising poverty and migration.

The economic collapse affected all sectors. According to the World Bank, the annual GDP growth rate at market prices in constant local currency fell by up to 20% in the early years of independence, with recovery from negative growth occurring only in 1996 (see Figure 1.7).

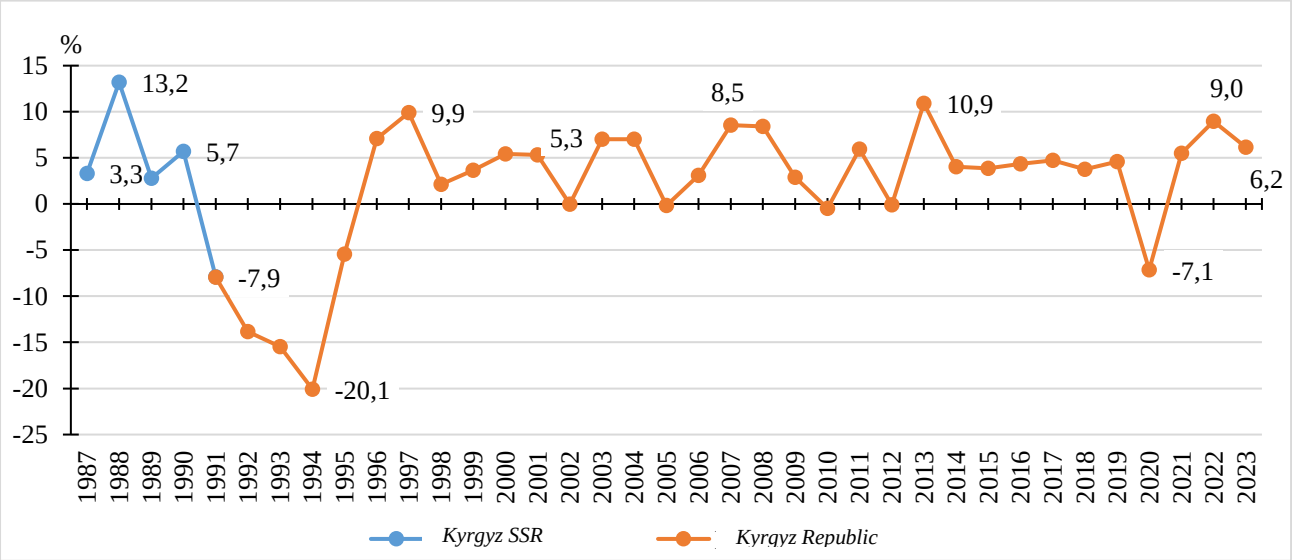



*Figure 1.7. GDP growth dynamics of the Kyrgyz Republic during the period 1987–2023*[29]

In different historical periods, the dynamics of GDP in purchasing power parity (PPP) terms evolved differently; however, the initial period of the Kyrgyz Republic's statehood is particularly illustrative for understanding the collapse of economic development as a decisive factor that, in turn, determined the level of total GHG emissions (see Figure 1.9 below).

[26] Energy Measurements of International Relations in Security in East Asia. Moscow: MGIMO University, 2007, p. 392.
[27] Marnie Sh., Whitlock E. Central Asia and Economic lntegration // RFE/RL Research Report. Vol. 2. № 14. 1993. 2 Apr. p. 34.
[28] Sitnyansky, G. Kyrgyzstan. Independence Achieved. What's Next? Asia and Africa Today, 1995, No. 6, p. 9.
[29] World Bank Group. Data. World Development Indicators. https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?locations=KG

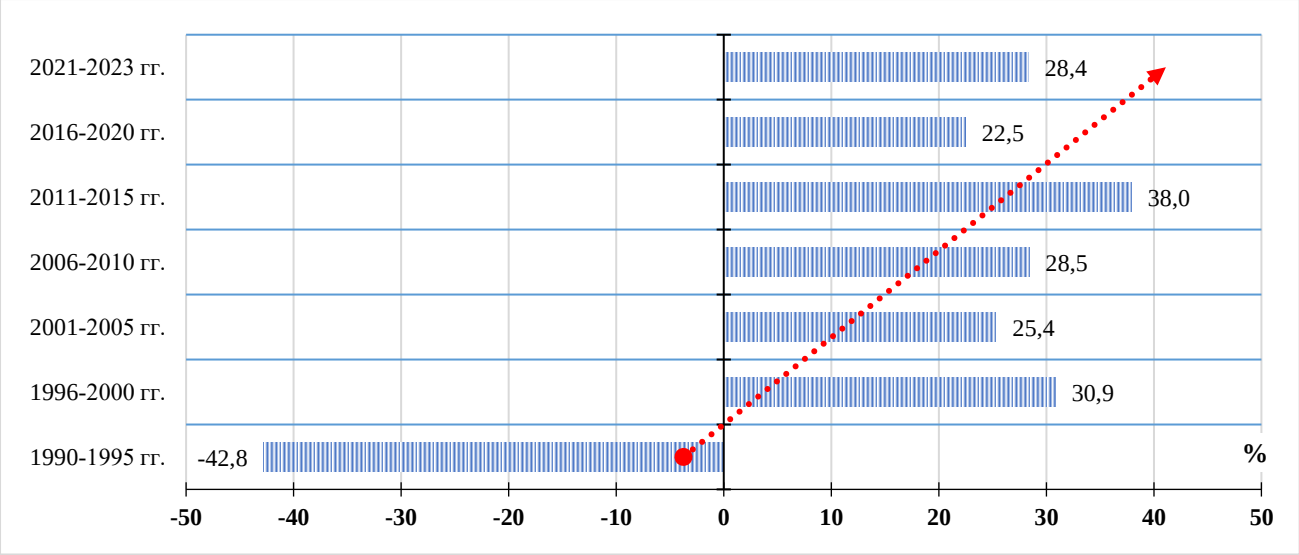



*Figure 1.8.GDP dynamics in purchasing power parity by historical periods, 1990–2023.*[30]

The GHG emissions in the Energy sector decreased by 48.8%, from 20,794.91 kt $CO_2$ eq. in 1990 to 10,651.90 kt $CO_2$ eq. in 2023, mainly due to the reduction of emissions in the category *Fuel combustion*, which resulted from a sharp decline in both the volume and the structure of consumption of major fuel and energy resources (FER) (see Table 1.4).

*Table 1.4. Changes in the consumption of major fuel and energy resources by historical periods.*[31]

| Type of fuel and energy resource | 1990–1995 (%) | 1995–2013 (%) | 2013–2023 (%) | 2020–2023 (%) | 1990–2023 (%) |
|---|---|---|---|---|---|
| Gasoline | –68.7 | 278 | –24.3 | 11.9 | –10.5 |
| Diesel | –75.3 | 345 | –27.2 | –3.9 | –19.9 |
| Fuel oil | –84.8 | –67 | –4.2 | –20.0 | –95.1 |
| Coal | –78.3 | 99 | 10.9 | 34.1 | –52.0 |
| Natural gas | –59.0 | –69 | 62.7 | 39.4 | –79.0 |
| Electricity | –9.9 | 47 | 40.2 | 15.3 | 85.9 |

As can be seen from the table, the sharp decline in the consumption of major fuel and energy resources during the period 1990–1995 had a significant impact on the overall consumption trend, despite the considerable increase observed in 1995–2013 (see Figure 1.9).

[30] World Bank Group. Data. World Development Indicators. https://data.worldbank.org/indicator/NY.GDP.MKTP.PP.CD?end=2023&locations=KG&start=1990

[31] National Statistical Committee of the Kyrgyz Republic (NSC). Distribution of Fuel and Energy Resources. https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fstat.gov.kg%2Fru%2Fstatistics%2Fdownload%2Fdynamic%2F348%2F&wdOrigin=BROWSELINK

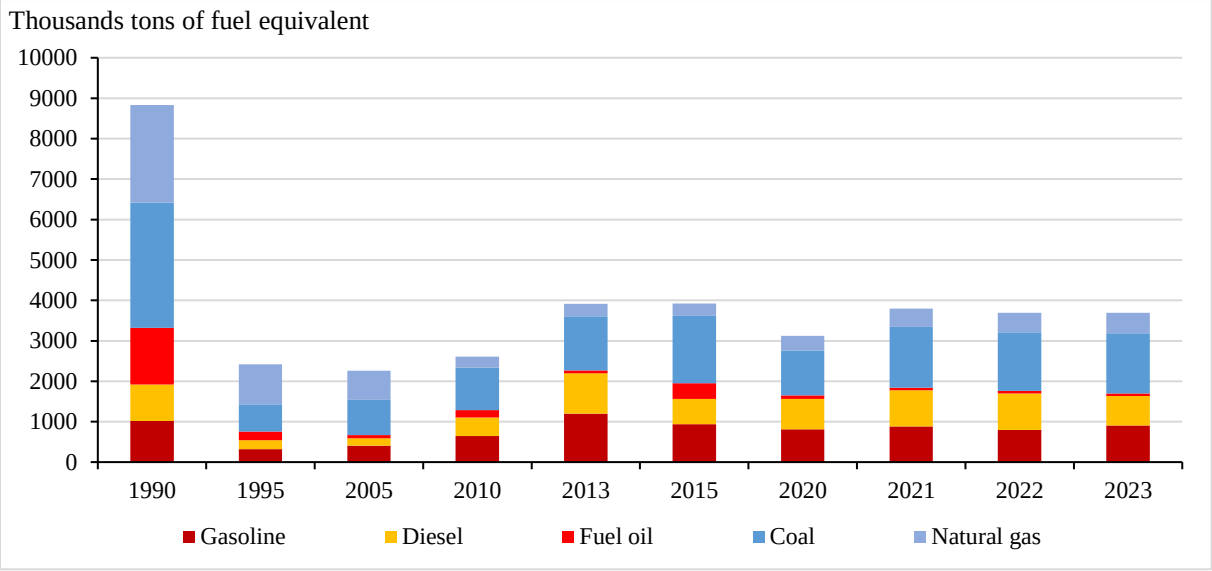



*Figure 1.9. Trends of major fuel and energy resources consumption during the period 1990–2023* [32]

In addition to the overall consumption volumes, the structure of FER consumption also changed. Compared to 1990, electricity consumption (driven by hydropower) increased sharply by 25 percentage points in 2023, while the shares of coal decreased by 10 percentage points, natural gas by 15 percentage points, and fuel oil by 14 percentage points i.e., fossil fuels as a whole (see Figure 1.10).

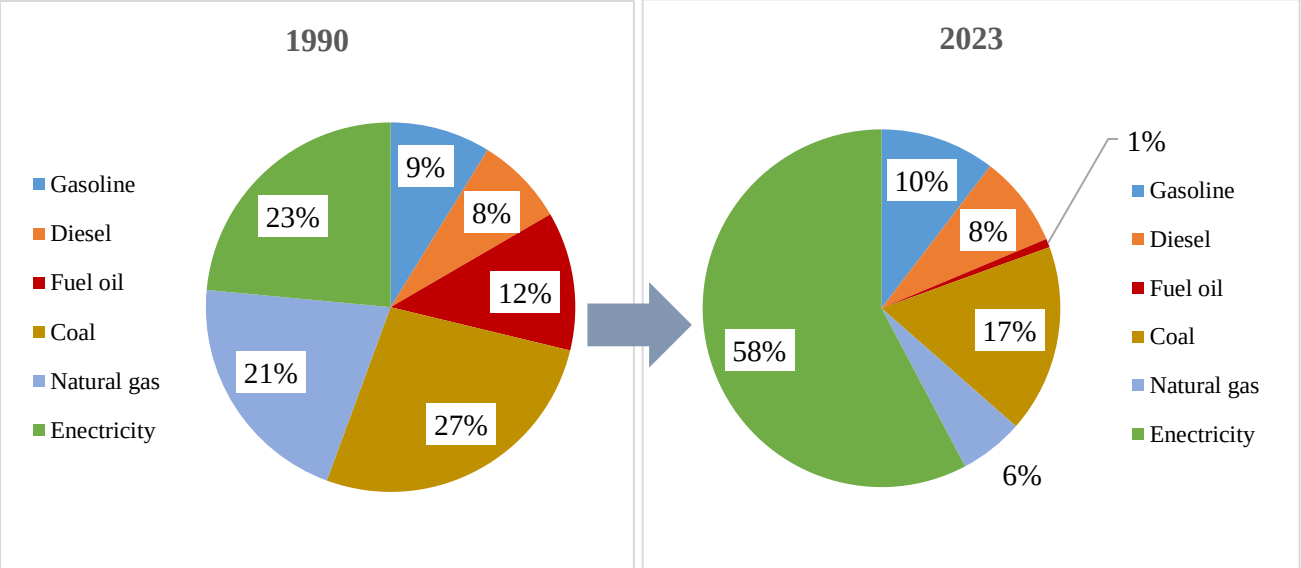



*Figure 1.10. Comparison of consumption of major fuel and energy resources (FER) in 1990 and 2023.*[33]

In 2023, greenhouse gas emissions from the second-largest emitting sector — *Agriculture* — reached the 1990 level and slightly exceeded it by 0.1%. In 1990, emissions from the sector reached 5,746.39 kt $CO_2$ eq., while in 2023 they were 5,754.41 kt $CO_2$ eq. The increase was mainly driven by emissions from *Enteric fermentation* (due to growth in livestock numbers) and *Direct $N_2O$ emissions from soils* (due to increased use of nitrogen fertilizers). Despite the decline in agricultural production during the

[32] NSC. Distribution of fuel and energy resources..
https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fstat.gov.kg%2Fru%2Fstatistics%2Fdownload%2Fdynamic%2F348%2F&wdOrigin=BROWSELINK
[33] Ibid.

period 1991–1995, caused by the political transition to a market economy and broader socio-economic transformation, by 2023 the agricultural sector of the country had evidently fully recovered.

Prior to the collapse of the USSR, there were around 700 collective and state farms in the republic, each managing up to 2,500 hectares of arable land. The republic was 90% self-sufficient in food products, with half of this volume processed domestically. Of the 1 million hectares of irrigated arable land available at that time, only 750,000 remain today; moreover, humus content in the soil has declined from 2% to 1%, which may result in land degradation to the extent that even wormwood might soon no longer grow. Many soils are salinized and subject to erosion.[34]

According to the National Statistical Committee (NSC), of nearly 10 million sheep the republic possessed in 1991, only 3.7 million remained by 1996. The dynamics of livestock and poultry numbers for the period 1990–2023 are presented in Figure 1.11 below.

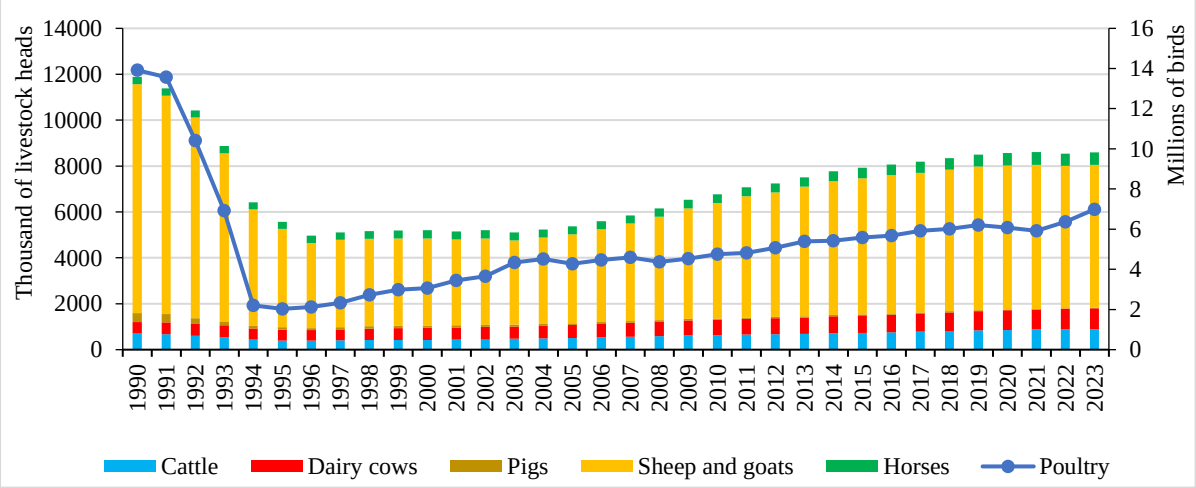



*Figure 1.11. Trends of livestock and poultry numbers during the period 1990–2023.*[35]

The production of major types of agricultural crops in the Kyrgyz Republic during the period 1990–1995 was also characterized by a decline. Thus, grain production decreased by 39.2%, pulses by 80.0%, cotton by 7.8%, tobacco by 67.3%, melons by 67.4%, fruits and berries by 52.2%, and grapes by 54.5% (see Figure 1.12).

[34] Orlov, D. Agriculture — From Dawn to Dusk. https://marx.kz/hystory/292-kak-unichtozhali-kyrgyzstan-selskoe-hozjajstvo-ot-rassveta-do-zakata.html

[35] NSC. Livestock and Poultry Population. https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fstat.gov.kg%2Fru%2Fstatistics%2Fdownload%2Fdynamic%2F362%2F&wdOrigin=BROWSELINK

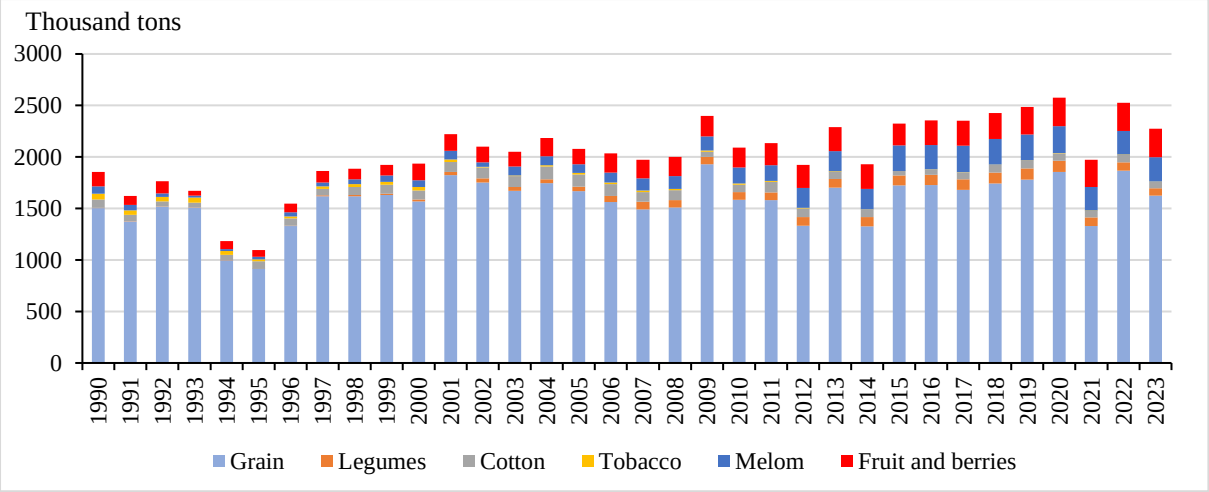



*Figure 1.12. Production of major crop products during the period 1990–2023*[36]

At the same time, it should be noted that in crop production, output had already recovered by 2000. In contrast, livestock production was able to reach the 1990 level only in 2008/2009, following a decline during 1990–1995, when meat production fell by 29.2%, milk by 27.1%, eggs by 79.4%, and wool by 62.1% (see Figure 1.13).

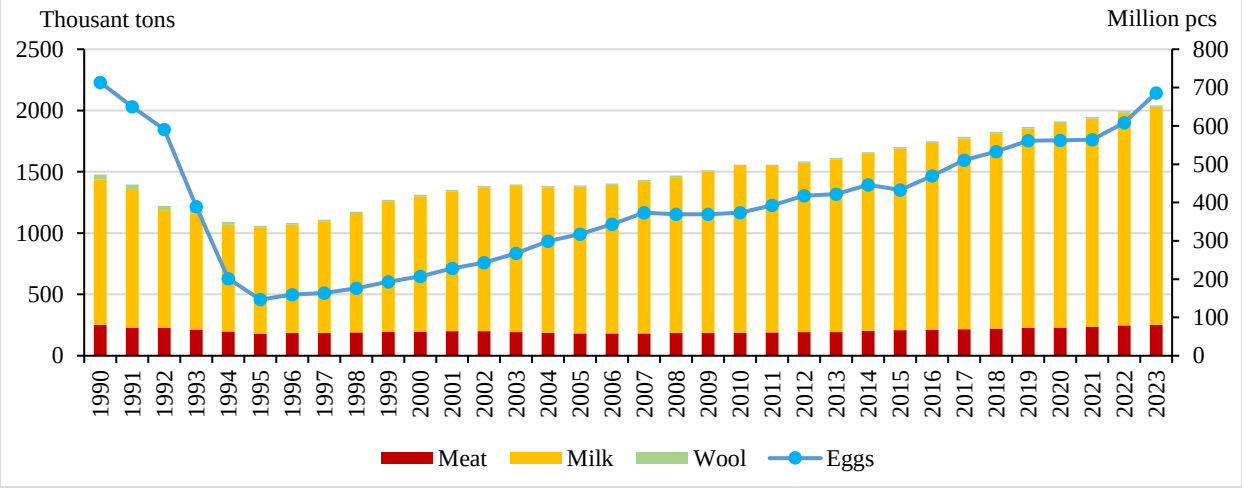



*Figure 1.13. Production of major livestock products during the period 1990–2023.*

The third-largest emitting sector in 2023 was Industrial Processes and Product Use (IPPU). Emissions from the IPPU sector increased by 130.38%, from 871.638 kt $CO_2$ eq. in 1990 to 2,008.04 kt $CO_2$ eq. in 2023. The main drivers of this increase were the construction of several new cement plants and private smelting workshops, the construction boom and expansion of brick production, as well as the start of active use of refrigerants and other equipment and materials containing HFCs. This resulted in a steady increase in emissions in the categories Cement production, Glass production, Ceramics production, and Refrigeration and air conditioning (both stationary and mobile).

After the collapse of the Soviet Union in 1991, industrial production in the Kyrgyz Republic declined between 1990 and 1995. Of 500 previously successful enterprises in mechanical engineering, electrical and electronic industries, only 50 are still in operation today. At the same time, during the Soviet period

[36] NSC. Production of Major Types of Agricultural Products of the Kyrgyz Republic. https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fstat.gov.kg%2Fru%2Fstatistics%2Fdownload%2Fdynamic%2F1281%2F&wdOrigin=BROWSELINK

(1965–1979), the GDP of the Kyrgyz Republic grew 2.5 times, and by 1979 the share of industry accounted for 70% of the total national economic output.[37]

Between 1985 and 1989, gross industrial output in Kyrgyzstan grew by 5% annually. However, with the breakdown of traditional supply and export linkages within the USSR, the country's industrial production decreased by 1% in 1990, collapsed by 23% in 1992, by 24% in 1995, and by 12.5% in 1995.[38]

In 1991, following the near shutdown of almost all industrial production caused by the cessation of raw material and component supplies, the elimination of export opportunities, and the lack of working capital, the share of industry in GDP fell to 12% in 1995, and stood at 12.6% in 2023.[39] Nevertheless, despite various crisis conditions, industrial production gradually acquired a stable growth trajectory starting in 2000 (see Figure 1.14).

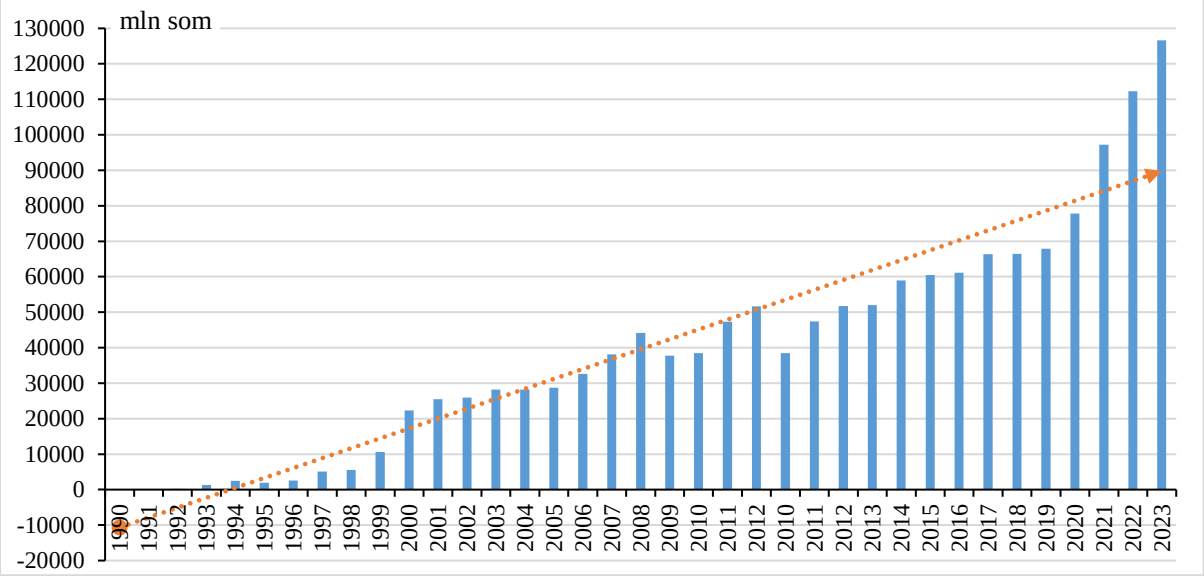



*Figure 1.14. Dynamics of the contribution of industrial production to Kyrgyzstan's GDP in the period 1990-2023.* [40]

GHG emissions from the *Waste* sector increased by 97.47%, from 486.04 kt $CO_2$ eq. in 1990 to 959.80 kt $CO_2$ eq. in 2023, as a result of high population growth rates (1.5–2%) — from 4,357,594 in 1990 to 7,037,590 in 2023 (see Figure 1.15).

[37] Minskaya Pravda. https://dzen.ru/a/YkwGNUth3hMCTq05?ysclid=ma9ouedogp56616401
[38] Encyclopedia of the Nations. Kyrgyzstan – Industry. https://www.nationsencyclopedia.com/Asia-and-Oceania/Kyrgyzstan-INDUSTRY.html#google_vignette
[39] NSC. GDP by Types of Economic Activity. https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fstat.gov.kg%2Fru%2Fstatistics%2Fdownload%2Fdynamic%2F333%2F&wdOrigin=BROWSELINK
[40] NSC. GDP by Sector of Origin at Current Prices.https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fstat.gov.kg%2Fru%2Fstatistics%2Fdownload%2Fdynamic%2F340%2F&wdOrigin=BROWSELINK

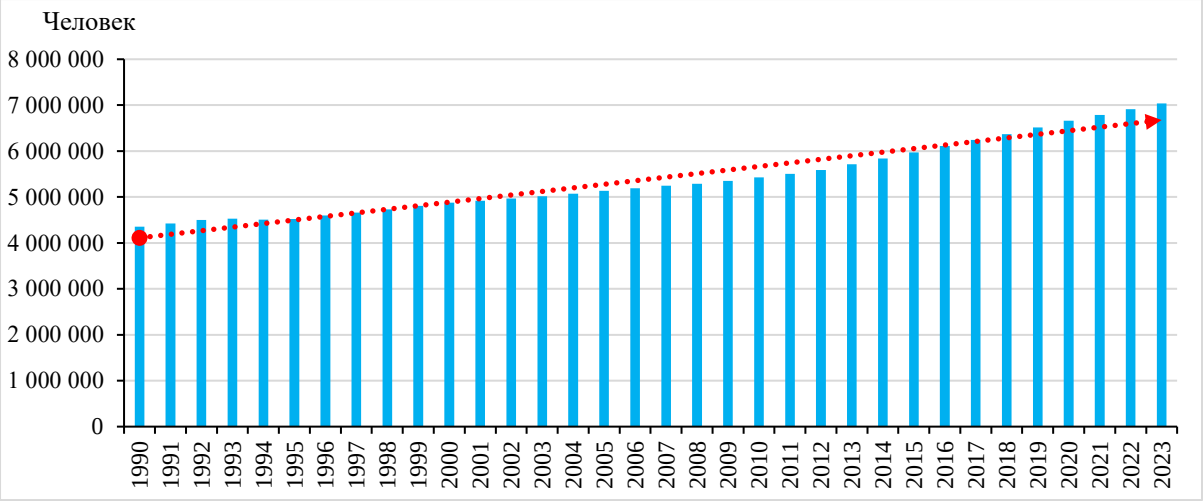



*Figure 1.15.Resident population of the Kyrgyz Republic during the period 1990–2023.*[41]

Accordingly, the volumes of municipal solid waste and wastewater also increased (see Figures 1.16 and 1.17), which in turn led to higher emissions from the two main categories of the Waste sector: *Solid waste disposal* and *Wastewater treatment and discharge*.


*Figure 1.16. Total volume of wastewater treated through wastewater treatment facilities*[42]

[41] NSC. Permanent Population of the Kyrgyz Republic. https://view.office-apps.live.com/op/view.aspx?src=https%3A%2F%2Fstat.gov.kg%2Fru%2Fstatistics%2Fdownload%2Fdynamic%2F315%2F&wdOrigin=BROWSELINK

[42] NSC. Statistical Compendia. Environment in the Kyrgyz Republic.2000-2006;2008-2012; 2009-2013; 2010-2014; 2011-2015; 2012-2016; 2013-2017; 2014-2018; 2015-2019; 2016-2020; 2017-2021; 2018-2022; 2019-2023.

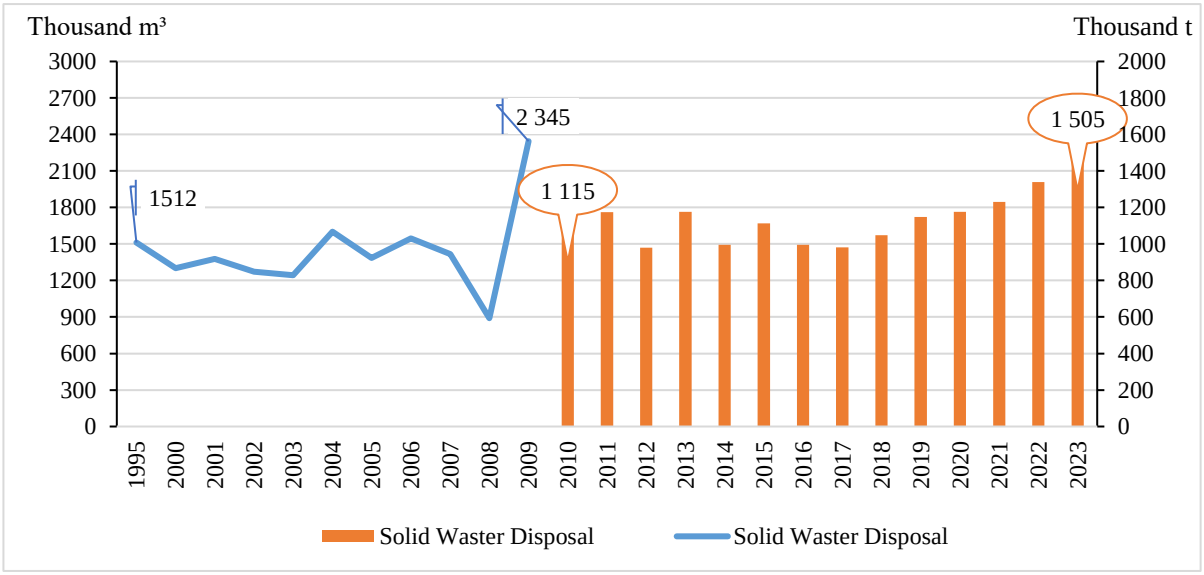


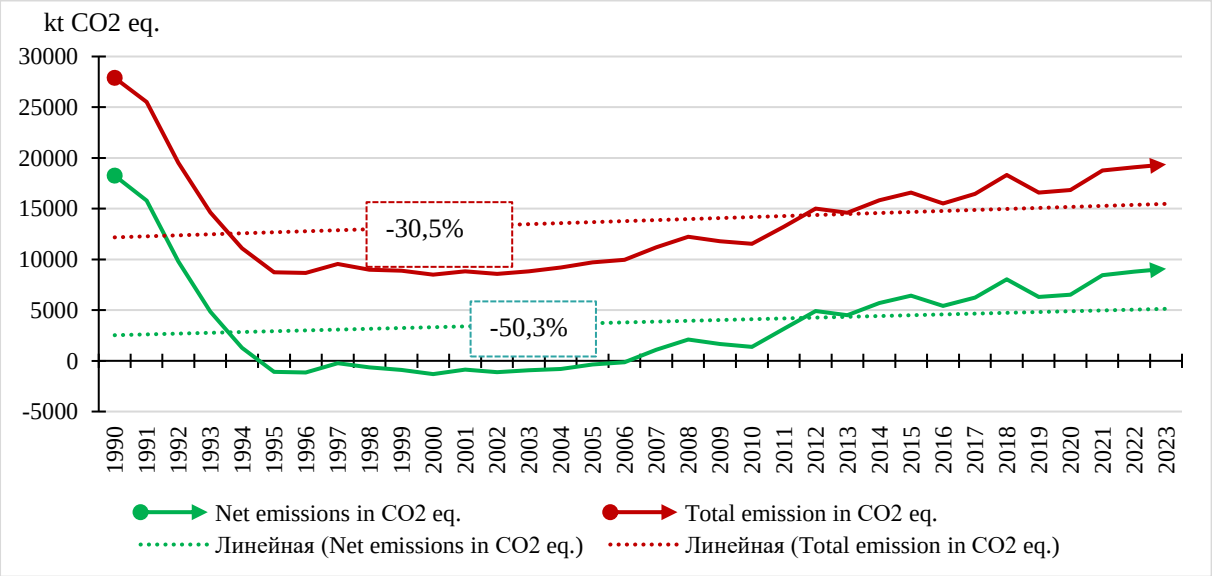

*Figure 1.17. Municipal solid waste (MSW) disposed during the period 1995–2023*[43]

Note: According to the NSC, the accounting of collected solid waste was performed in cubic meters until 2010, and in tonnes thereafter.

### *1.3.2.2 Total removals*

The volume of removals in the LULUCF sector increased by 6.9%, from 9,639.98 kt $CO_2$ eq. in 1990 to 10,308.89 kt $CO_2$ eq. in 2023. Net emissions in 2023 amounted to 9,065.27 kt $CO_2$ eq. compared to 18,259.00 kt $CO_2$ eq. in 1990, which corresponds to a reduction of 50.35%.

The dynamics of total and net GHG emissions for the period 1990–2023, along with the corresponding linear trends, are presented in Figure 1.18.




[43] NSC. Statistical Compendia. Environment in the Kyrgyz Republic. 2000-2006;2008-2012; 2009-2013; 2010-2014; 2011-2015; 2012-2016; 2013-2017; 2014-2018; 2015-2019; 2016-2020; 2017-2021; 2018-2022; 2019-2023.

*Figure 1.18. Dynamics of total and net GHG emissions during the period 1990–2023.*[44]

### *1.3.2.3 Net emissions*

Net emissions are defined as the difference between the level of total emissions and the total removals. In simple terms, net GHG emissions represent total emissions minus total removals.

Net emissions include emissions from the Energy, IPPU, Agriculture, and Waste sectors (total emissions), combined with both emissions and removals from the LULUCF sector.

In 1990, the net emissions of the Kyrgyz Republic amounted to 18,259.00 kt $CO_2$ eq. between 1990 and 2023, net GHG emissions decreased by 50.35% (9,192.13 kt $CO_2$ eq.) and stood at 9,065.27 kt $CO_2$ eq.

The main reasons for the reduction in net emissions were the sharp decline in total emissions, as described above, while removals remained almost unchanged.

At the same time, the dynamics of net emissions in the Kyrgyz Republic were significantly influenced by cycles of forest planting and harvesting, which affect the LULUCF sector. $CO_2$ removals in the LULUCF sector have been increasing since 1990. Current rates of timber harvesting and wood collection are close to historically low levels, reflecting the establishment of extensive plantation forests in the 1980s and early 1990s. Forests created during that period are gradually reaching maturity, a process that will continue throughout the 2020s. Harvesting rates are declining, while the average age of stands is increasing each year. Younger stands generally have lower growth rates compared to older and fast-growing stands. In the future, as harvesting decreases and the growth rates of replanted forests increase, net removals are likely to rise.

In addition, the dynamics of net emissions have also been significantly influenced by traditionally developed horticulture and other perennial plantations, such as fruit orchards and shrubs. The areas of these plantations are maintained through ongoing reconstruction of old orchards and replacement of aged trees and shrubs. Natural pasturelands with shrub vegetation also contribute to this trend.

The dynamics of removals in the LULUCF sector by forest lands, perennial croplands, and grasslands for the period 1990–2023 are presented in Figure 1.19.

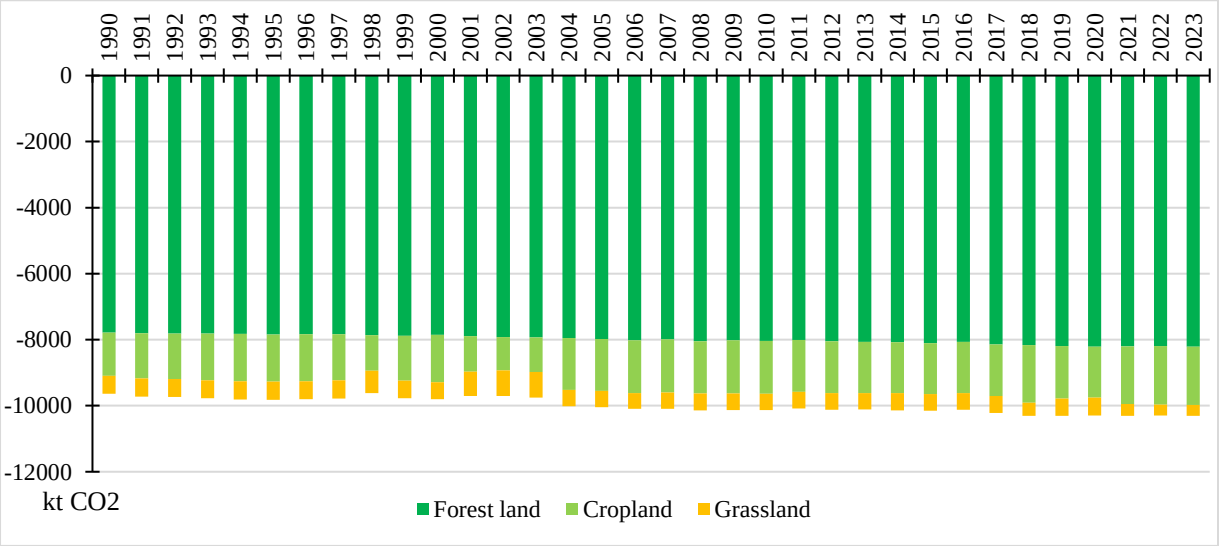



*Figure1.19. Dynamics of Removals by Sinks in Forests, Cropland, and Grassland.*

[44] MNRETS. National Inventory Document. National Report on the Inventory of Greenhouse Gas Emissions and Removals for the Period 1990–2023. 2025.

Figure 1.20 illustrates the contribution of each inventory sector to net emissions since 1990. The *Energy* and *Agriculture* sectors have dominated the total emissions of the Kyrgyz Republic. Together, these two sectors accounted for between 86% and 95% of the country's annual total GHG emissions during the period 1990–2023. The *IPPU* and *Waste* sectors generated relatively small amounts of GHG emissions, within the ranges of 3–11% and 2–5% of annual total emissions, respectively, throughout the time series. Conversely, the *LULUCF* sector has been a net sink of GHG emissions over the period 1990–2023.

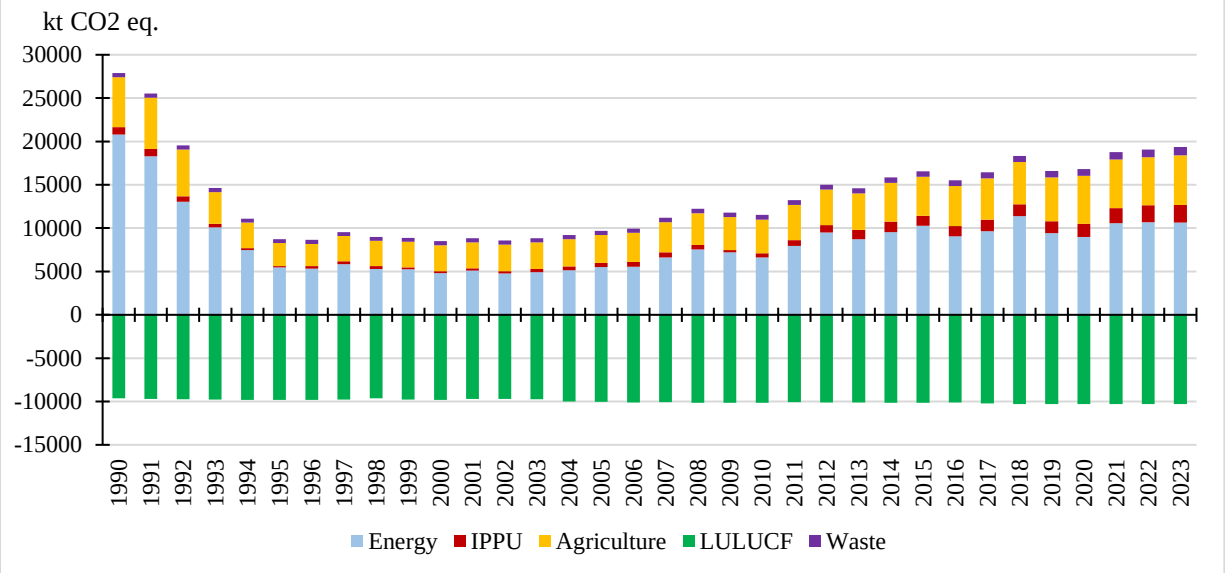



*Figure1.20. Trends in Greenhouse Gas Emissions in the Kyrgyz Republic by Source 1990–2023.*

Note: IPPU = Industrial Processes and Product Use; kt $CO_2$ eq. = kilotons of carbon dioxide equivalent; LULUCF = Land Use, Land-Use Change and Forestry.

### *1.3.2.4 Dynamics of GHG emissions by gas type*

The main anthropogenic GHG in the Kyrgyz Republic in 2023 was carbon dioxide ($CO_2$), which accounted for 58% of total GHG emissions. The largest source of $CO_2$ and of total GHG emissions was the combustion of fossil fuels, primarily in the transport and energy sectors. Methane ($CH_4$) accounted for 29% of total emissions, mainly from livestock in the agriculture sector. Nitrous oxide ($N_2O$), generated primarily through the use of synthetic nitrogen fertilizers in agriculture, accounted for 10% of total emissions. Fluorinated gases (F-gases, including HFCs, PFCs and $SF_6$), originating from the industrial sector, accounted for 3% of total emissions. Figure 1.21 shows how the structure of total emissions in 2023 compares with that in 1990

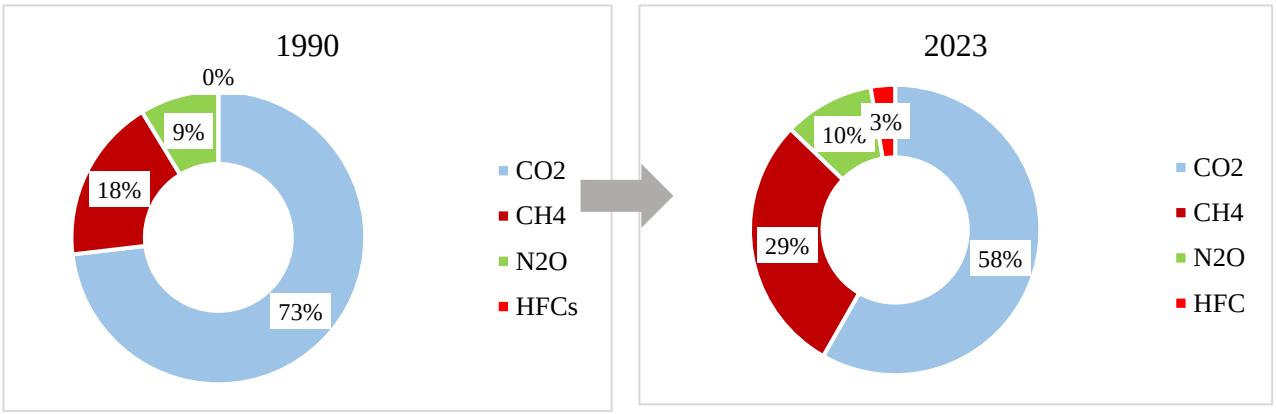


*Figure 1.21. Share of Greenhouse Gases in Total Emissions in 1990 and 2023.*

### *Carbon dioxide ($CO_2$)*

In 1990, total $CO_2$ emissions were estimated at 20,310.36 kt, accounting for 73% of the total GHG emissions of the Kyrgyz Republic. By 2023, $CO_2$ emissions had decreased by 44.4% (9,025.58 kt) compared to the base year and totaled 11,284.78 kt, or 58.25% of the country's total GHG emissions (see Figure 1.22).

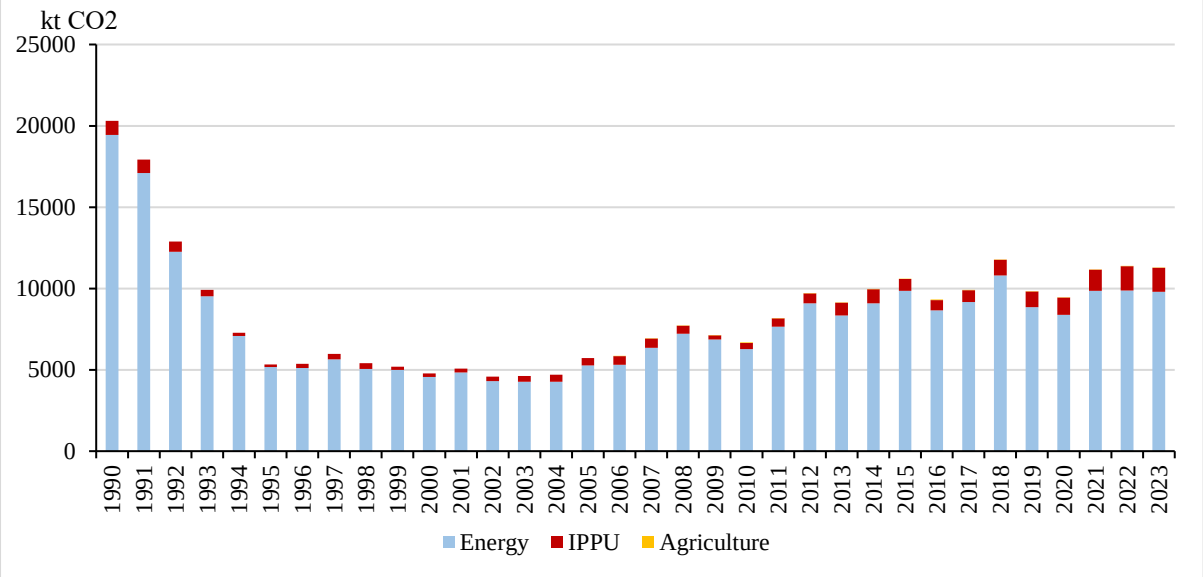



*Figure 1.22. Carbon Dioxide ($CO_2$) Emissions by Source in 1990–2023.*

The energy sector was the main source of $CO_2$ emissions in 2023, accounting for 87% of the total, primarily from fossil fuel combustion in transport and in electricity and heat production. It was followed by the industrial sector (13%) and agriculture (0.13%), according to the National Inventory Document (NID).

The LULUCF sector in the Kyrgyz Republic acted as a net sink of $CO_2$ during the period 1990–2023. In 1990, the amount of $CO_2$ absorbed by the LULUCF sector was estimated at 9,639.98 kt. By 2023, $CO_2$ removals had increased by 6.94% compared with the base year, reaching 10,308.89 kt. The increase in removals was driven not so much by biomass expansion, but rather by the updating and refinement of the national forest inventory data, which corrected deficiencies of earlier inventories. As a result, $CO_2$ removals in the LULUCF sector offset approximately 47.5% of total $CO_2$ emissions in 1990 and 91.3% of $CO_2$ emissions in 2023. Consequently, net $CO_2$ emissions declined from 10,670.38 kt in 1990 to 975.58 kt in 2023 (Figure 1.23, with rounded values).

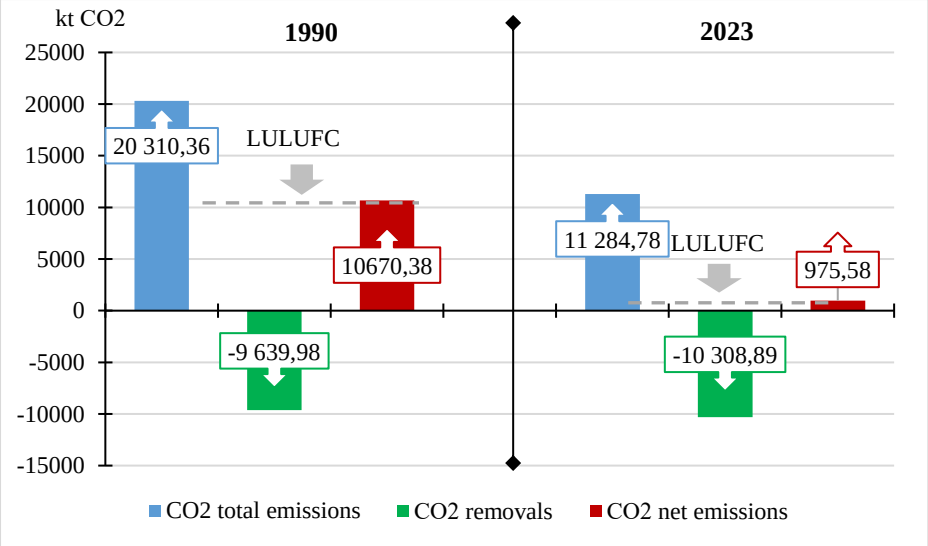



*Figure 1.23. Total and Net Carbon Dioxide ($CO_2$) Emissions and Removals in 1990 and 2023.*

### *Methane ($CH_4$)*

In 2023, methane ($CH_4$) emissions in the Kyrgyz Republic amounted to 5,611.58 kt $CO_2$ eq., representing 29% of the country's total emissions. The main source of emissions was agriculture, which accounted for 70,7% of total national methane emissions, primarily from livestock (enteric fermentation). Compared with 1990, methane emissions increased by 11.3%, or by 571.35 kt $CO_2$ eq. (Figure 1.24).

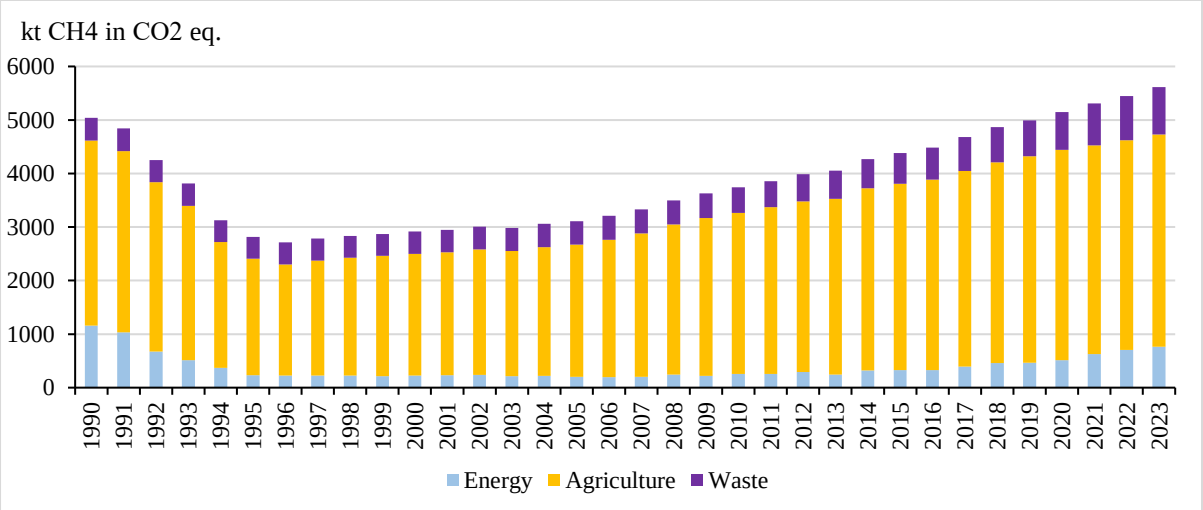



*Figure 1.24. Methane ($CH_4$) Emissions and Removals by Source in 1990–2023.*

The waste sector accounted for about 16% of methane emissions, primarily from unmanaged solid waste disposal at landfills and wastewater discharges. A further 14% originated from the energy sector, specifically from fuel combustion and fugitive fuel emissions. Overall, methane emissions in 2023 increased by 11.3% compared with the 1990 level. This increase can be explained by the growth in livestock numbers, particularly cattle, whose population exceeded the 1990 public herd by 28.7%. This reflects the fact that cattle have become the only reliable means of income capitalization for rural households, with high liquidity, as well as the steady increase in waste generation resulting from population growth and improved living standards.

### *Nitrous oxide ($N_2O$)*

In 2023, nitrous oxide ($N_2O$) emissions in the Kyrgyz Republic amounted to 1,951.69 kt $CO_2$ eq., representing 10.1% of the country's total GHG emissions. Agriculture was the main contributor, accounting for 1,776.95 kt $CO_2$ eq., or 91% of total $N_2O$ emissions. The principal sources of agricultural $N_2O$ emissions include soil management practices, such as fertilizer application and manure use. The energy sector also contributed to $N_2O$ emissions, amounting to 96.79 kt $CO_2$ eq., or 5% of total $N_2O$ emissions, mainly from solid fuel combustion in the "*Combined electricity and heat production"* category. Emissions from the waste sector totaled 77.95 kt $CO_2$ eq., or 4% of total $N_2O$ emissions.

The trend in total $N_2O$ emissions from 1990 to 2023 shows a clear pattern, with a sharp decline between 1990 and 1996, followed by a gradual increase through 2023. Overall, $N_2O$ emissions decreased by 596.448 kt $CO_2$ eq., or 23.4%, compared with the 1990 level (Figure 1.25).

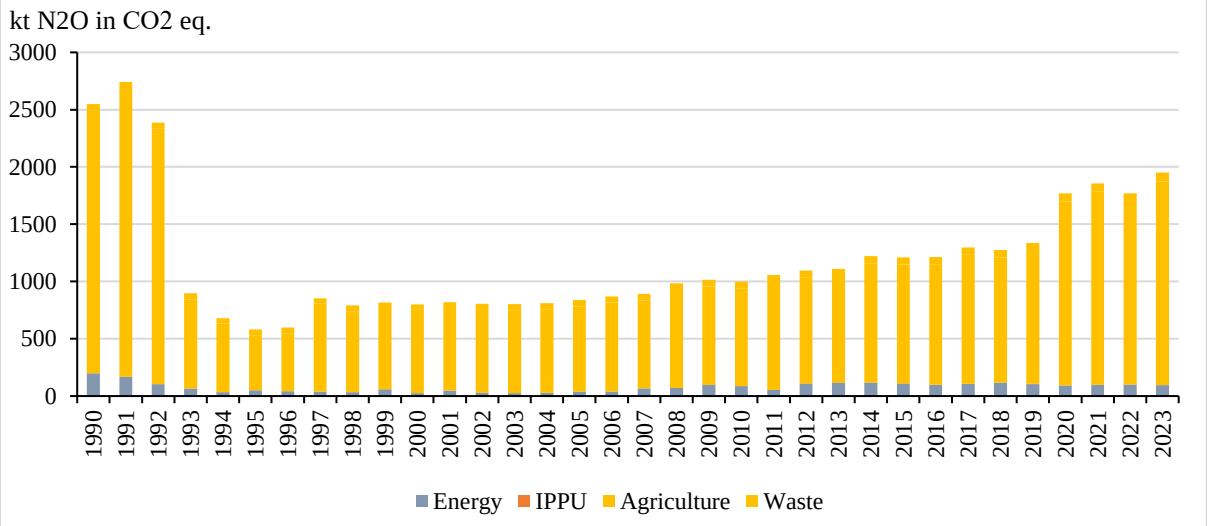



*Figure 1.25. Nitrous Oxide ($N_2O$) Emissions by Source in 1990–2023.*

### *Fluorinated gases (F-gases)*

Fluorinated gases (F-gases) in the Kyrgyz Republic, including hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride ($SF_6$), are primarily emitted as a result of industrial activities. In 2023, total F-gas emissions, represented by hydrofluorocarbons (HFCs), amounted to 526.11 kt $CO_2$ eq., or 3% of the country's total emissions. In the Kyrgyz Republic, HFCs are used in refrigeration systems, air conditioning, foam blowing agents and certain industrial processes.

HFCs began to be used in the Kyrgyz Republic in 1995, as substitutes for chlorofluorocarbons (CFCs). Between 1995 and 2020, the main types of HFCs identified in the country included HFC-32, HFC-125, HFC-134a, HFC-143a, and HFC-227ea. In 2023, HFC-245fa and HFC-365mfc were added to this set.

The increase in HFC emissions is closely linked to the country's overall industrial development and the growing demand for construction and fire-resistant gas-containing materials, as well as for cooling and air conditioning systems. This trend is associated with factors such as population growth, improved housing conditions, and the wider and more intensive use of refrigeration and air conditioning systems in residential, commercial and administrative buildings and in transport, as well as the extensive use of foam blowing agents in construction. The dynamics of hydrofluorocarbon emissions are presented in Figure 1.26 below.

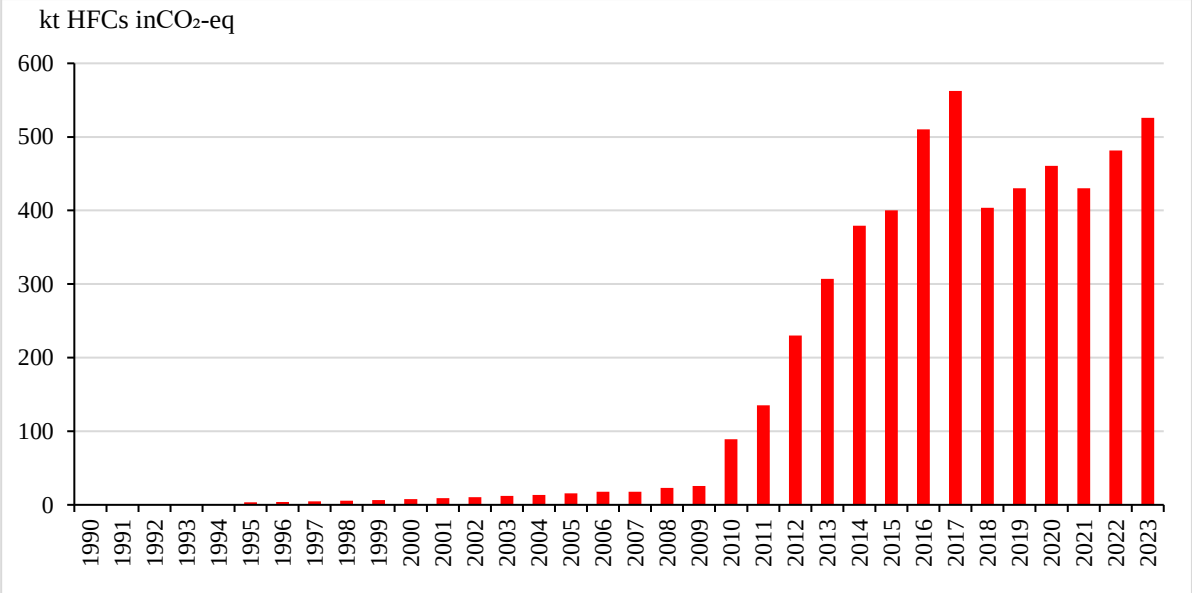



*Figure 1.26. Hydrofluorocarbon Emissions in the Kyrgyz Republic in 1995–2023.*

### *1.3.2.5 Dynamics of greenhouse gas emissions by sector*

In 1990, the energy sector of the Kyrgyz Republic dominated GHG emissions, accounting for 74% of the total. Agriculture was the second largest emitting sector, contributing 21%, mainly from livestock and fertilizer use. Industrial processes accounted for 3% of total emissions, with the largest share from cement production. The waste sector represented 2% of total emissions in 1990, primarily from sanitary landfills and wastewater management. As noted above (see, for example, section 1.2.2.2), the LULUCF sector acted as a net sink in 1990, with net removals of 9,639.979 kt $CO_2$.

It should be noted that the trend in emissions during the period 1990–1995 differed significantly from the subsequent period for two reasons: changes in the intersectoral balance and production volumes in the post-Soviet period, and the near absence of hydrofluorocarbon (HFC) emissions, which began to be used on the national market only from 1995 onwards.

In 2023, the energy sector of the Kyrgyz Republic continued to dominate GHG emissions, accounting for 55% of the total. This reflects the country's continued heavy dependence on fossil fuels: coal consumed by the predominantly rural population, gasoline and diesel consumed by all modes of transport, fuel oil and coal for combined heat and power generation, and household use of natural gas in urban areas. At the same time, hydropower remains the primary source of electricity, with more than 86.8% of electricity generated by hydropower plants in 2023 (see Figure 1.27).

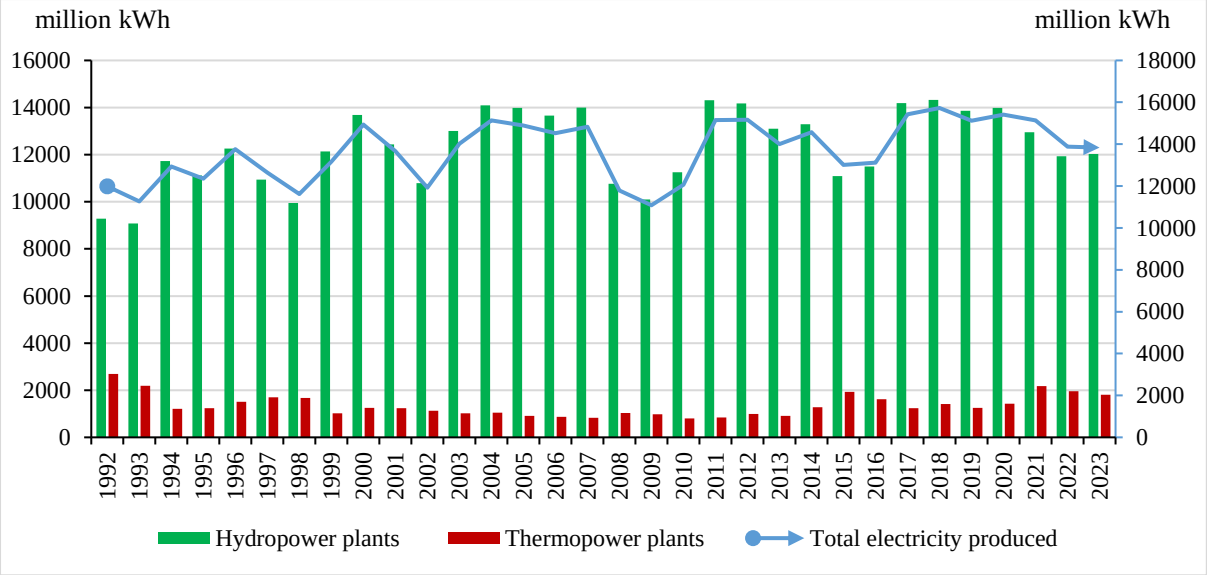



*Figure 1.27. Electricity Generation by Source in 1992–2023.*

Agriculture ranked second, accounting for 30% of total GHG emissions, mainly from livestock and fertilizer use. Emissions from industrial processes and product use accounted for 10% of total emissions, with the largest contributions from cement production and the use of cooling systems.

In the waste sector, GHG emissions represented 5% of total national emissions in 2023, primarily from sanitary landfills and wastewater management. As noted above (see, for example, section 1.3.2.1), the LULUCF sector continued to act as a net sink in 2023, with total removals amounting to 10,309.203 kt $CO_2$. The distribution of emissions by sector is presented in Figure 1.28.

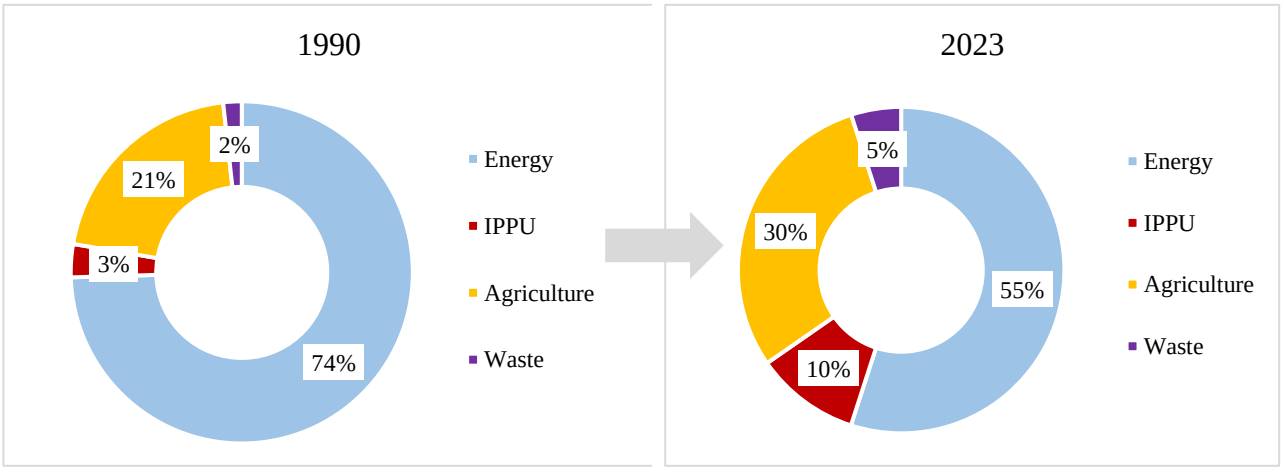



*Figure 1.28. Share of Greenhouse Gas Emissions by Source in 1990 and 2023.*

### *1.3.2.5.1 Energy*

The energy sector in the Kyrgyz Republic is the main source of GHG emissions due to the country's high dependence on road transport and on fossil fuels such as coal, oil and gas for electricity and heat generation, as well as for energy use in industrial processes. In 2023, the energy sector produced approximately 10,651.90 kt $CO_2$ eq., accounting for the largest share of total national GHG emissions.

This indicator was 6.4% lower than in 2018, reflecting the incomplete economic recovery and the gradual increase in energy demand following the decline during the COVID-19 period. Compared with the last year of the previous inventory (2020), GHG emissions from the sector increased by 18.6%.

Nevertheless, emissions from the sector remained 48.8% below the 1990 level, reflecting the consequences of the country's deindustrialization. The main GHGs in the sector are carbon dioxide ($CO_2$), methane ($CH_4$) and nitrous oxide ($N_2O$).

In the Kyrgyz Republic, the energy sector is represented by the following categories:

**1.A – Fuel combustion activities**

- 1.A.1 – Energy industries
- 1.A.2 – Manufacturing industries and construction
- 1.A.3 – Transport
- 1.A.4 – Other sectors

**1.B – Fugitive emissions from fuels**

- 1.B.1 – Solid fuels
- 1.B.2 – Oil and natural gas
- 1.B.3 – Other emissions from energy production

The source category 1.C – Carbon dioxide transport and storage – is not applied in the Kyrgyz Republic, as no such activities are undertaken.

In addition, the sector includes "memo items" that are not counted in the national GHG inventory but are reported as so-called "international bunkers." In the Kyrgyz Republic, this includes category 1.D.1.a – International aviation. Furthermore, subcategory 1.D.3 – $CO_2$ emissions from biomass combustion – is also reported. [45]

In 2023, the largest source of GHG emissions within the Energy sector was the Transport category, which accounted for 34% of total sectoral emissions, equivalent to 3,601.42 kt $CO_2$ eq. This reflects the fact that, given the mountainous terrain of the country, road transport serves as the primary means of passenger mobility and freight transport. The development needs of the regions, population growth in urban areas, and rising living standards have driven an increase in the number of vehicles. Furthermore, in the early 2000s, this trend was reinforced by a shift from public transport to the use of private passenger vehicles. It should also be noted, however, that the centralized supply of low-cost fuels during the Soviet period contributed to the fact that emissions in 2023 for this category were still 16.2% lower than in 1990.

The second largest source of GHG emissions in the Energy sector in 2023 was the Energy industries category (electricity and heat production), which accounted for about 31% of sectoral emissions, or 3,317.98 kt $CO_2$ eq. This was 59.3% lower than in 1990. The reduction was mainly due to decreased coal consumption, modernization of thermal power plants, and increased generation from hydropower. In addition, in the late 1990s and early 2000s, there was a decline in the number of subscribers to centralized district heating systems in urban areas, with a shift towards more efficient individual heating systems.

The *Other sectors* category, which includes heating systems for households and organizations, accounted for 24% of Energy sector emissions in 2023, or 2,558.55 kt $CO_2$ eq. This was 59.9% lower than in 1990. The reduction was primarily due to the historically high level of coal consumption in the 1980s and 1990s, when coal was inexpensive and regularly supplied from other Soviet republics to meet the needs of households and boiler plants in the Kyrgyz Republic. The termination of regular coal supplies and the increase in coal prices following the dissolution of the USSR led to a decline in coal consumption between 1990 and 2000, during which demand was met mainly by domestic production. These factors, together with subsequent efforts to expand gas supply to households and boiler plants, also contributed to limiting coal consumption and reducing emissions in this category.

[45] IPCC. 2006. Guidelines for National Greenhouse Gas Inventories. Volume 2.

The *Manufacturing industries and construction* category accounted for 5% of Energy sector emissions in 2023, equivalent to 531.15 kt $CO_2$ eq. This was 58.2% lower than in 1990, reflecting the decline in industrial and construction activity after the collapse of the Soviet Union, despite its gradual recovery in recent decades. Following the privatization process, many industries reduced their overall energy consumption, which was also associated with the gradual increase in energy prices.

Fugitive emissions from fuels associated with underground and open-pit coal mining totaled 304.96 kt $CO_2$ eq. in 2023, which was 17.8% lower than in 1990. At the same time, emissions from venting, leakage during oil extraction and upgrading, as well as from venting, production, processing, transportation, storage and distribution of natural gas, increased by 1.3% compared with 1990, reaching 339.322 kt $CO_2$ eq. This change reflects the development of extraction and transportation technologies, as well as improvements in monitoring and leak prevention measures.

Overall, emissions from the Energy sector reflect the structure of the economy and the energy profile of the Kyrgyz Republic (Figure 1.29).

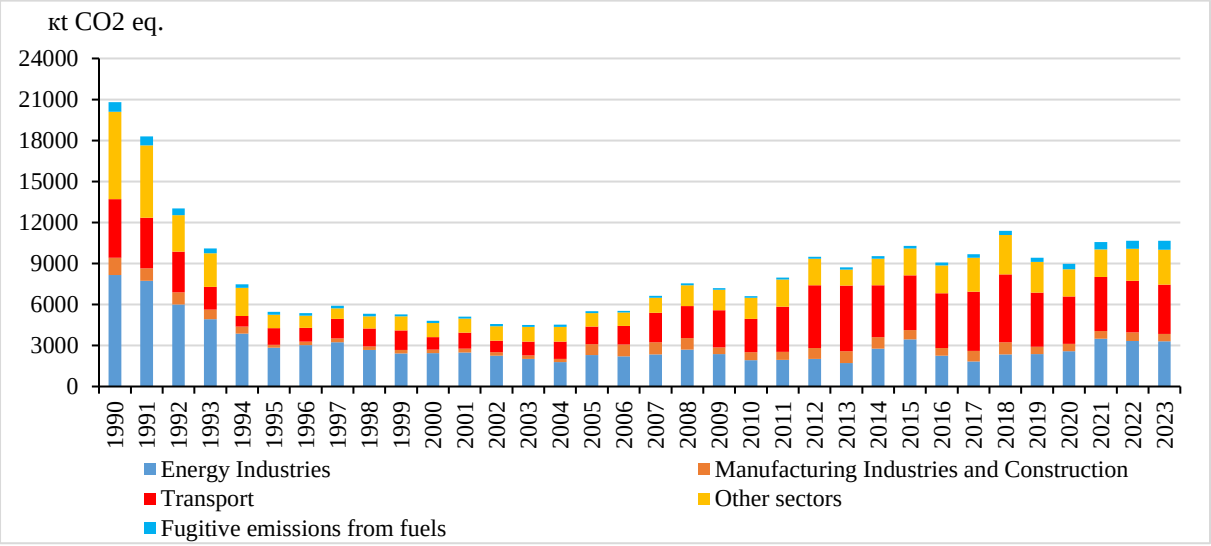



*Figure 1.29. Emissions from the Energy Sector by Source in 1990–2023.*

### *1.3.2.5.2 Industrial Processes and Product Use (IPPU)*

The IPPU sector in the Kyrgyz Republic is a significant source of GHG emissions, particularly in industries such as metallurgy and mineral production. In 2023, total emissions from the IPPU sector reached 2,008.04 kt $CO_2$ eq. Compared with the 1990 level, emissions increased by 130.4%, primarily reflecting the growth in cement production, which in 2023 was 123.4% higher than in 1990. The main GHGs emitted in this sector are carbon dioxide ($CO_2$) and hydrofluorocarbons (HFCs).

The principal source categories assessed within the IPPU sector in 2023 include the following:

**2.A – Mineral industry**
- 2.A.1 – Cement production
- 2.A.2 – Lime production
- 2.A.3 – Glass production
- 2.A.4 – Other processes using carbonates

**2.C – Metal industry**
- 2.C.1 – Iron and steel production

**2.D – Solvent and other product use**
- 2.D.1 – Lubricant use
- 2.D.2 – Paraffin wax use

**2.F – Product uses as substitutes for ozone-depleting substances**

- 2.F.1 – Refrigeration and air conditioning
- 2.F.2 – Foam blowing agents
- 2.F.6 – Other applications

**2.G – Other product manufacture and use**

- 2.G.3 – $N_2O$ from product use

**2.H – Other**

- 2.H.1 – Pulp and paper industry
- 2.H.2 – Food and beverage industry

Emissions from categories **2.B – Chemical industry** and **2.E – Electronics industry** are not assessed in the Kyrgyz Republic, as such types of production are absent.

The production of mineral materials is the main source of emissions in the IPPU sector, particularly the *cement production* subcategory, which in 2023 accounted for 69.5% of total sectoral emissions, or 1,396.18 kt $CO_2$ eq. This was 136% higher than in 1990. The increase in cement production is associated with the commissioning of several cement plants in the Kyrgyz Republic, which meet domestic construction needs and also supply exports to neighboring countries. Emissions from the *ceramics/brick production* subcategory in 2023 accounted for 1.5% of sectoral emissions, or 29.49 kt $CO_2$ eq. Emissions from *glass production* were 1% of total sectoral emissions, or 20.12 kt $CO_2$ eq., while another 1% of total sectoral emissions, or 20.26 kt $CO_2$ eq., originated from *lime production.*

Another significant source category within the IPPU sector is refrigeration and air conditioning**,** which in 2023 accounted for 24.5% of total sectoral emissions, or 491.26 kt $CO_2$ eq. Emissions from this category have increased dramatically since its emergence in 1995 (3.64 kt $CO_2$ eq.), by several orders of magnitude (14,365.7%). Emissions from the foam blowing agents subcategory amounted to 34.85 kt $CO_2$ eq. in 2023, representing 1.7% of total sectoral emissions. The growth in HFC emissions is linked to the widespread use of F-gases for both stationary and mobile refrigeration and air conditioning, as well as the increasing application of foam blowing agents in construction and households.

The metallurgical industry (in particular, iron and steel production) was almost idle in 2023; therefore, emissions were recorded only under the 'Other' subcategory, associated with metal scrap remelting, amounting to 0.19 kt $CO_2$ eq., or 0.009% of total sectoral emissions.

Emissions from the lubricant use subcategory in 2023 reached 15.63 kt $CO_2$ eq., or 0.8% of total sectoral emissions, while emissions from the use of paraffin waxes totaled 0.06 kt $CO_2$ eq., or 0.003% of total sectoral emissions.

Overall, the IPPU sector in the Kyrgyz Republic is becoming an increasingly significant source of emissions, primarily due to the mineral industry and the growing use of HFCs (see Figure 1.30).

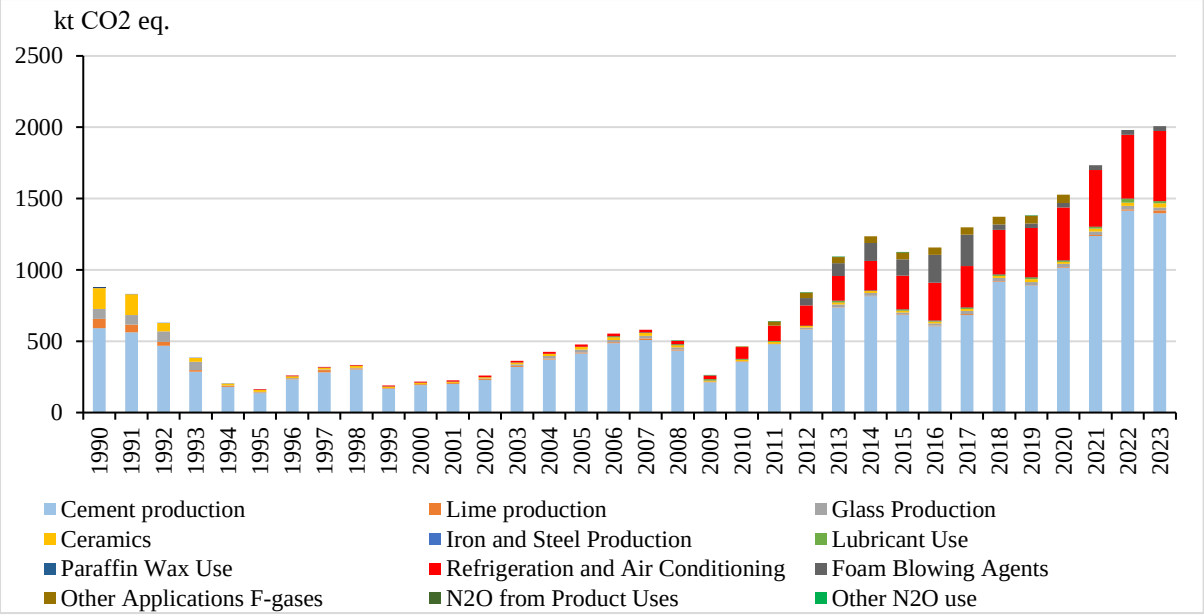



*Figure 1.30. Emissions from the Industrial Processes and Product Use (IPPU) Sector by Source Categories, 1990–2023.*

### *1.3.2.5.3 Agriculture*

In 2023, total emissions from this sector stood at 5,754.41 kt $CO_2$ eq., representing a 0.1% increase compared with the 1990 level. The main GHGs emitted from agriculture are methane ($CH_4$) and nitrous oxide ($N_2O$), with carbon dioxide ($CO_2$) contributing only in minor amounts.

In 2023, $CH_4$ emissions totaled 3,962.54 kt $CO_2$ eq., or 69% of sectoral emissions, which was 14.7% higher than in 1990. $N_2O$ emissions reached 1,776.95 kt $CO_2$ eq. (31%), which was 22.5% lower than in 1990. $CO_2$ emissions in the sector were negligible, accounting for about 0.3% of sectoral emissions, or 14.92 kt $CO_2$ eq.

The main source categories assessed in Agriculture in 2023 include the following:

**3.A – Enteric fermentation**
- 3.A.1 – Cattle
- 3.A.2 – Sheep
- 3.A.3 – Swine
- 3.A.4 – Other livestock

**3.B – Manure management**
- 3.B.1 – Cattle
- 3.B.2 – Sheep
- 3.B.3 – Swine
- 3.B.4 – Other livestock
- 3.B.5 – Indirect $N_2O$ emissions

**3.C – Rice cultivation**

**3.D – Agricultural soils**
- 3.D.1 – Direct $N_2O$ emissions from managed soils
  - 3.D.1.a – Inorganic N fertilizers
  - 3.D.1.b – Organic N fertilizers
  - 3.D.1.c – Urea application
- 3.D.2 – Indirect $N_2O$ emissions from managed soils

The main source of $CH_4$ emissions is the Enteric fermentation category in livestock, which in 2023 accounted for 65.8% of total emissions in the sector, or 3,783.69 kt $CO_2$ eq. Direct $N_2O$ emissions mainly came from soil management, including the use of synthetic nitrogen fertilizers and farming practices, and amounted to 876.29 kt $CO_2$ eq., or 15.2% of total sectoral emissions. Emissions from manure management in 2023 were 505.15 kt $CO_2$ eq., or 8.8% of the sector. Indirect $N_2O$ emissions from managed soils accounted for 5.4% of the sector, or 311.42 kt $CO_2$ eq., while indirect $N_2O$ emissions from manure management were 192.32 kt $CO_2$ eq., or 3.6% of the sector.

$CH_4$ emissions from rice cultivation in 2023 made up 1.2% of the sector, or 10.62 kt $CO_2$ eq., while $CO_2$ emissions from urea use amounted to 14.92 kt $CO_2$ eq., or 0.3% of the sector.

Changes in emissions in the early 1990s were linked to changes in livestock numbers and the expansion of farming activities. These trends were connected to the initial economic downturn after the collapse of the USSR (1990–1995), followed by recovery and a gradual improvement of economic conditions, especially after 2000. Agriculture remains the second largest source of greenhouse gas emissions in the country after the energy sector. The trend of emissions in agriculture by source category is shown in Figure 1.31.

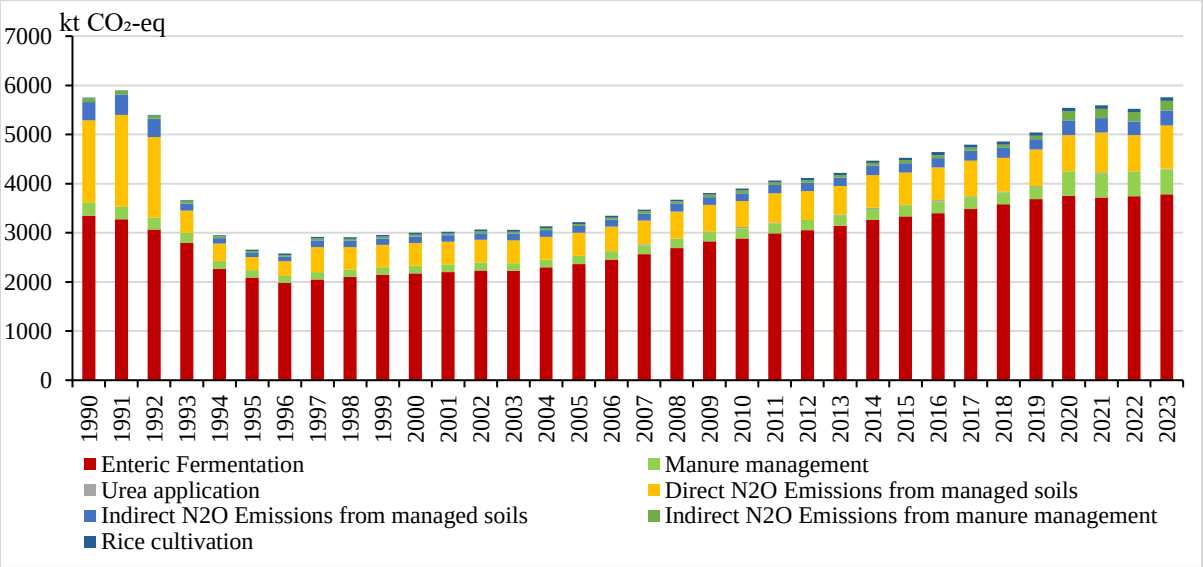



*Figure 1.31. Emissions from the Agriculture Sector by Source Categories, 1990–2023.*

### *1.3.2.5.4 Land Use, Land-Use Change and Forestry (LULUCF)*

In the Kyrgyz Republic, the accounting of emissions from sources and removals by sinks in the LULUCF sector is carried out under the following categories:

4.A – Forest land
- 4.A.1 – Forest land remaining forest land
- 4.A.2 – Land converted to forest land

4.B – Cropland
- 4.B.1 – Cropland remaining cropland
- 4.B.2 – Land converted to cropland

4.C – Grassland
- 4.C.1 – Grassland remaining grassland
- 4.C.2 – Land converted to grassland

4.D – Wetlands
- 4.D.1 – Wetlands remaining wetlands
- 4.D.2 – Land converted to wetlands

4.E – Settlements

- 4.E.1 – Settlements remaining settlements
- 4.E.2 – Land converted to settlements

4.F – Other land

- 4.F.1 – Other land remaining other land
- 4.F.2 – Land converted to other land

Due to difficulties in collecting data across all of the above land-use categories and the lack of resources for such research, the 2025 inventory includes only those categories for which land-use data are available for the entire time series 1990–2023.

Overall, the LULUCF sector in the Kyrgyz Republic is a net sink. In 2023, total removals in this sector amounted to 10,308.89 kt $CO_2$, reducing the country's total emissions by 53%. This level of removals was 6.9% higher than in 1990 and 0.15% higher than in 2020, the year of the previous NGHGI.

The LULUCF sector contributes both to carbon sequestration and to GHG emissions from natural fires, mainly on forest land. In 2023, total emissions from natural fires on 79.3 hectares of forest land totaled 0.315 kt $CO_2$ eq. (65% $CH_4$ and 35% $N_2O$).

The assessment of removals in 2023 by LULUCF category covered forest land, cropland and grassland. Forest land in the Kyrgyz Republic absorbed 8,123.66 kt $CO_2$ (79.7% of total $CO_2$ removals). Perennial woody vegetation on cropland absorbed 1,767.18 kt $CO_2$ (17.1% of total removals). Grasslands absorbed 328.37 kt $CO_2$, or 3.2% of total removals (see Figure 1.32).

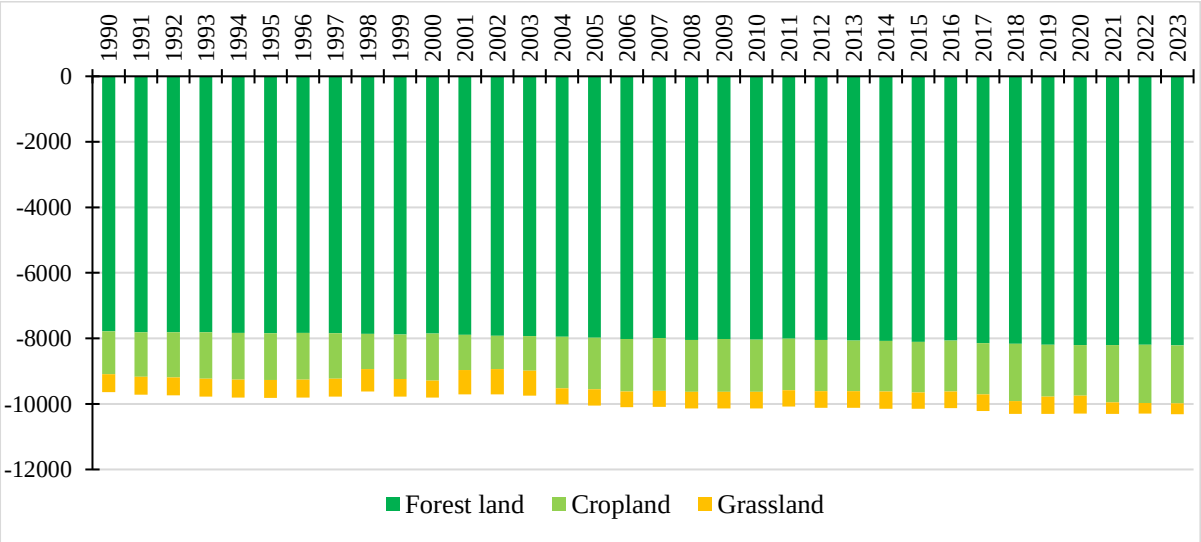



*Figure 1.32. Carbon Dioxide ($CO_2$) Removals in the LULUCF Sector by Land-Use Categories in 1990–2023.*

### *1.3.2.5.5 Waste*

In the Kyrgyz Republic, GHG emissions from sources in the Waste sector are accounted for under the following categories:

5.A – Solid waste disposal

- 5.A.1 – Managed solid waste disposal sites
- 5.A.2 – Unmanaged solid waste disposal sites
- 5.A.3 – Unspecified solid waste disposal sites

5.B – Biological treatment of solid waste

- 5.B.1 – Composting

5.C – Incineration and open burning of waste

- 5.C.1 – Incineration
- 5.C.2 – Open burning of waste

5.D – Wastewater treatment and discharge

- 5.D.1 – Domestic wastewater treatment and discharge
- 5.D.2 – Industrial wastewater treatment and discharge

5.E – Other

In 2023, total emissions from this sector amounted to 959.80 kt $CO_2$ eq., which was 97.5% higher than in 1990, largely due to a 64.4% increase in population. The main GHGs emitted from the Waste sector are methane ($CH_4$) and nitrous oxide ($N_2O$).

In 2023, $CH_4$ emissions totaled 881.85 kt $CO_2$ eq. (91.9% of sectoral emissions), which was 24.7% higher than in 2020 and 106.4% higher than in 1990. $N_2O$ emissions amounted to 77.950 kt $CO_2$ eq. (8.1% of sectoral emissions), representing an increase of 32.7% compared with 1990.

The largest source category of $CH_4$ and $N_2O$ emissions in 2023 was wastewater treatment and discharge, with emissions of 562.916 kt $CO_2$ eq., or 58.6% of total sectoral emissions, which was 96.5% higher than in 1990. $CH_4$ emissions from solid waste disposal amounted to 381.912 kt $CO_2$ eq., or 39.8% of the sector, representing an increase of 109.8% compared with 1990.

Emissions from incineration and open burning of waste in 2023 were 13.212 kt $CO_2$ eq. (1.4% of the sector), 15.8% lower than in 2020 and 14.4% lower than in 1990. Emissions from biological treatment of solid waste were 1.764 kt $CO_2$ eq., or 0.2% of sectoral emissions, 15.2% higher than in 2020 but 18.9% lower than in 1990 (see Figure 1.33).

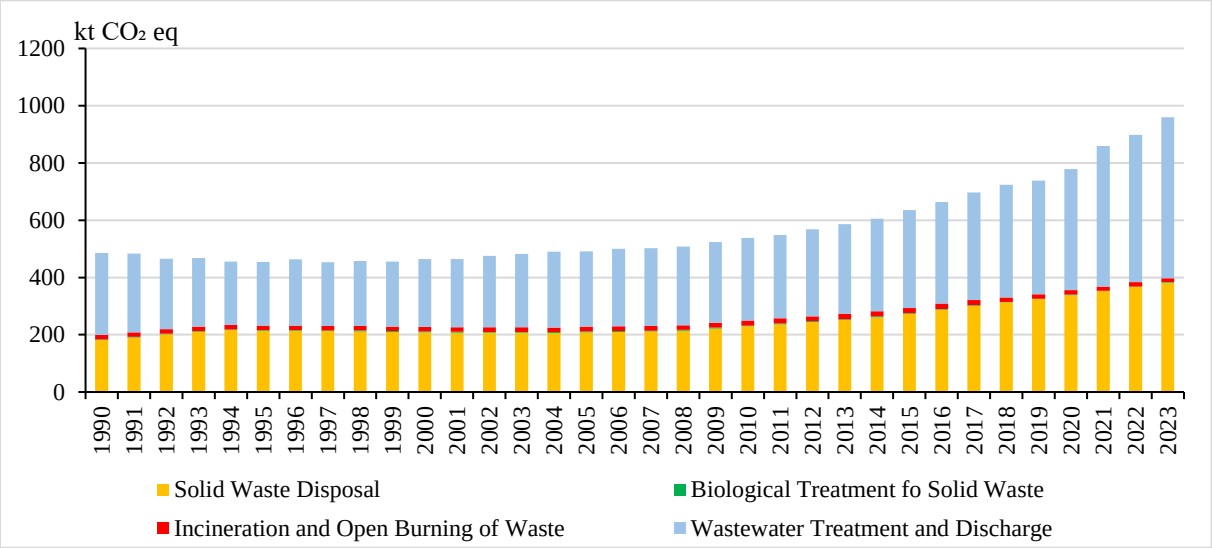



*Figure 1.33. Trends in GHG Emissions in the Waste Sector by Sources in 1990–2023.*

### *1.3.2.6 Summary tables of GHG emissions and removals for the period 1990–2023*

*Table 1.5. GHG emissions by gas type for the period 1990–2023, kt $CO_2$ eq.*

| Year | $CO_2$ | $CH_4$ | $N_2O$ | HFC | Год | $CO_2$ | $CH_4$ | $N_2O$ | HFC |
|---|---|---|---|---|---|---|---|---|---|
| **1990** | 20 310,36 | 5 040,23 | 2 548,39 | NE | **2007** | 6 945,90 | 3 330,69 | 890,92 | 17,90 |
| **1991** | 17 931,12 | 4 845,58 | 2 740,84 | NE | **2008** | 7 720,19 | 3 499,77 | 982,98 | 23,19 |
| **1992** | 12 895,73 | 4 252,10 | 2 386,74 | NE | **2009** | 7 122,45 | 3 630,34 | 1 014,64 | 25,50 |
| **1993** | 9 923,45 | 3 812,57 | 898,35 | NE | **2010** | 6 690,20 | 3 744,78 | 997,81 | 88,99 |
| **1994** | 7 282,83 | 3 125,69 | 680,49 | NE | **2011** | 8 164,77 | 3 858,50 | 1 055,42 | 135,17 |
| **1995** | 5 337,77 | 2 814,02 | 582,00 | 3,64 | **2012** | 9 702,37 | 3 987,21 | 1 096,76 | 229,92 |
| **1996** | 5 335,13 | 2 713,43 | 597,24 | 4,09 | **2013** | 9 138,83 | 4 055,04 | 1 109,16 | 307,00 |

| Year | $CO_2$ | $CH_4$ | $N_2O$ | HFC | Год | $CO_2$ | $CH_4$ | $N_2O$ | HFC |
|---|---|---|---|---|---|---|---|---|---|
| **1997** | 5 898,30 | 2 782,79 | 853,03 | 4,72 | **2014** | 9 968,71 | 4 266,73 | 1 222,02 | 379,52 |
| **1998** | 5 358,29 | 2 835,58 | 790,24 | 5,51 | **2015** | 10 579,16 | 4 379,49 | 1 211,64 | 400,32 |
| **1999** | 5 192,93 | 2 868,94 | 817,33 | 6,47 | **2016** | 9 318,76 | 4 482,73 | 1 213,25 | 510,10 |
| **2000** | 4 770,39 | 2 918,53 | 798,59 | 7,60 | **2017** | 9 915,82 | 4 678,39 | 1 297,44 | 562,61 |
| **2001** | 5 062,43 | 2 947,11 | 818,21 | 8,90 | **2018** | 11 788,13 | 4 866,43 | 1 276,03 | 403,74 |
| **2002** | 4 757,61 | 3 007,88 | 804,19 | 10,36 | **2019** | 9 827,30 | 4 992,62 | 1 336,14 | 430,20 |
| **2003** | 5 028,35 | 2 981,76 | 802,25 | 11,99 | **2020** | 9 451,14 | 5 147,93 | 1 768,49 | 460,60 |
| **2004** | 5 321,93 | 3 062,24 | 811,80 | 13,66 | **2021** | 11 164,33 | 5 311,72 | 1 855,25 | 430,21 |
| **2005** | 5 729,49 | 3 110,31 | 838,60 | 15,76 | **2022** | 11 376,22 | 5 447,70 | 1 769,88 | 481,59 |
| **2006** | 5 848,40 | 3 208,83 | 870,54 | 17,90 | **2023** | 11 284,78 | 5 611,58 | 1 951,69 | 526,11 |

*Table 1.6. GHG emissions and removals by source categories for the period 1990–2023, kt $CO_2$ eq.*

| Year | Energy | IPPU | Agriculture | LULUCF | Waste | Net emissions in kt CO2 eq. | Total emission in kt CO2 eq. |
|---|---|---|---|---|---|---|---|
| **1990** | 20 794,91 | 871,64 | 5 746,39 | -9 639,98 | 486,04 | 18 259,00 | 27 898,97 |
| **1991** | 18 302,92 | 829,76 | 5 901,38 | -9 722,11 | 483,47 | 15 795,44 | 25 517,54 |
| **1992** | 13 038,40 | 636,14 | 5 394,75 | -9 736,19 | 465,29 | 9 798,39 | 19 534,58 |
| **1993** | 10 106,93 | 393,43 | 3 665,83 | -9 777,30 | 468,19 | 4 857,07 | 14 634,37 |
| **1994** | 7 475,52 | 210,27 | 2 948,18 | -9 809,38 | 455,04 | 1 279,63 | 11 089,01 |
| **1995** | 5 457,40 | 169,15 | 2 656,09 | -9 817,29 | 454,79 | -1 079,86 | 8 737,43 |
| **1996** | 5 337,47 | 271,21 | 2 577,53 | -9 802,59 | 463,69 | -1 152,69 | 8 649,90 |
| **1997** | 5 833,72 | 331,97 | 2 919,39 | -9 780,49 | 453,76 | -241,64 | 9 538,84 |
| **1998** | 5 277,20 | 346,58 | 2 908,09 | -9 621,68 | 457,75 | -632,07 | 8 989,62 |
| **1999** | 5 271,36 | 202,10 | 2 956,31 | -9 775,70 | 455,92 | -890,02 | 8 885,68 |
| **2000** | 4 800,18 | 227,86 | 3 002,30 | -9 803,12 | 464,77 | -1 308,01 | 8 495,11 |
| **2001** | 5 114,27 | 236,65 | 3 020,93 | -9 703,30 | 464,80 | -866,65 | 8 836,65 |
| **2002** | 4 766,63 | 269,04 | 3 068,34 | -9 703,85 | 476,03 | -1 123,81 | 8 580,04 |
| **2003** | 4 913,61 | 370,01 | 3 057,88 | -9 748,94 | 482,86 | -924,59 | 8 824,36 |
| **2004** | 5 154,21 | 435,13 | 3 130,15 | -10 013,57 | 490,15 | -803,93 | 9 209,64 |
| **2005** | 5 505,41 | 482,93 | 3 214,64 | -10 045,66 | 491,17 | -351,51 | 9 694,15 |
| **2006** | 5 540,84 | 556,23 | 3 348,15 | -10 096,17 | 500,43 | -150,51 | 9 945,66 |
| **2007** | 6 624,49 | 586,68 | 3 471,25 | -10 089,36 | 503,00 | 1 096,06 | 11 185,42 |
| **2008** | 7 537,96 | 507,67 | 3 672,35 | -10 139,12 | 508,17 | 2 087,01 | 12 226,14 |
| **2009** | 7 195,65 | 263,56 | 3 810,51 | -10 133,67 | 523,20 | 1 659,25 | 11 792,92 |
| **2010** | 6 619,77 | 466,41 | 3 897,25 | -10 136,11 | 538,35 | 1 385,67 | 11 521,78 |
| **2011** | 7 962,36 | 640,13 | 4 063,11 | -10 082,03 | 548,27 | 3 131,84 | 13 213,87 |
| **2012** | 9 492,61 | 841,13 | 4 114,27 | -10 119,20 | 568,26 | 4 897,06 | 15 016,27 |
| **2013** | 8 709,26 | 1 092,33 | 4 221,86 | -10 115,91 | 586,59 | 4 494,12 | 14 610,03 |
| **2014** | 9 525,44 | 1 237,25 | 4 469,33 | -10 145,19 | 604,96 | 5 691,78 | 15 836,98 |
| **2015** | 10 283,35 | 1 124,14 | 4 527,92 | -10 150,99 | 635,20 | 6 419,62 | 16 570,61 |
| **2016** | 9 064,59 | 1 156,66 | 4 639,62 | -10 125,57 | 663,97 | 5 399,27 | 15 524,84 |
| **2017** | 9 662,52 | 1 299,16 | 4 795,03 | -10 215,20 | 697,55 | 6 239,06 | 16 454,25 |
| **2018** | 11 379,72 | 1 373,85 | 4 856,95 | -10 304,22 | 723,80 | 8 030,10 | 18 334,32 |
| **2019** | 9 426,28 | 1 382,29 | 5 038,90 | -10 303,23 | 738,79 | 6 283,03 | 16 586,26 |
| **2020** | 8 977,85 | 1 527,41 | 5 543,90 | -10 294,02 | 779,00 | 6 534,14 | 16 828,16 |
| **2021** | 10 573,98 | 1 733,06 | 5 595,44 | -10 302,80 | 859,02 | 8 458,70 | 18 761,50 |
| **2022** | 10 672,88 | 1 981,30 | 5 523,02 | -10 293,17 | 898,20 | 8 782,23 | 19 075,40 |
| **2023** | 10 651,90 | 2 008,04 | 5 754,41 | -10 308,89 | 959,80 | 9 065,27 | 19 374,16 |

# 2. Information necessary to track progress in the implementation and achievement of NDCs

## 2.1 National circumstances and institutional arrangements

In accordance with paragraph 69 of the MPGs, this section presents the national circumstances relevant to the progress achieved in the implementation and achievement of the country's NDCs under Article 4 of the Paris Agreement.

### 2.1.1 Structure of public governance

The Kyrgyz Republic is a sovereign, democratic, legal, secular, unitary, and social state. State power in the Kyrgyz Republic is based on the principle of separation of powers into legislative, executive, and judicial branches, and on their coordinated functioning and interaction.

The President of the Kyrgyz Republic is the Head of State, embodying the unity of the people and state authority. The President is elected for a term of six years. Executive power in the Kyrgyz Republic is exercised by the Cabinet of Ministers, which also performs the functions of the Presidential Administration. The Cabinet oversees ministries, state committees and agencies, administrative departments, and local state administrations.

The Jogorku Kenesh — the Parliament of the Kyrgyz Republic — is the highest representative body exercising legislative authority and oversight functions within its mandate.

Judicial power is exercised through constitutional, civil, criminal, administrative, and other types of legal proceedings. The judicial system of the Kyrgyz Republic consists of the Supreme Court and local courts. The Constitutional Chamber operates within the Supreme Court.

Public administration consists of three levels of administrative and territorial division. As of 1 January 2024, the administrative and territorial structure of the Kyrgyz Republic included 7 regions (oblasts), the cities of Bishkek and Osh with the status of cities of republican significance, 40 districts (excluding urban districts), 31 cities, 9 urban-type settlements, 3 settlements, and 453 rural districts.

In accordance with the Decree of the President of the Kyrgyz Republic, [46] the structure of the Cabinet of Ministers of the Kyrgyz Republic is defined as follows:

- Chair of the Cabinet of Ministers of the Kyrgyz Republic – Head of the Presidential Administration of the Kyrgyz Republic;
- First Deputy Chair of the Cabinet of Ministers of the Kyrgyz Republic;
- Deputy Chair of the Cabinet of Ministers of the Kyrgyz Republic;
- Deputy Chair of the Cabinet of Ministers of the Kyrgyz Republic – Minister of Water Resources, Agriculture and Processing Industry of the Kyrgyz Republic;
- Deputy Chair of the Cabinet of Ministers of the Kyrgyz Republic – Chair of the State Committee for National Security of the Kyrgyz Republic;
- Deputy Chair of the Cabinet of Ministers of the Kyrgyz Republic – Plenipotentiary Representative of the President of the Kyrgyz Republic in Batken Region of the Kyrgyz Republic;
- Ministry of Economy and Commerce of the Kyrgyz Republic;
- Ministry of Finance of the Kyrgyz Republic;

[46] Decree of the President of the Kyrgyz Republic "On the Structure and Composition of the Cabinet of Ministers of the Kyrgyz Republic and on the Structure of the Administration of the President of the Kyrgyz Republic" dated 12 October 2021, No. UP-425

- Ministry of Foreign Affairs of the Kyrgyz Republic;
- Ministry of Justice of the Kyrgyz Republic;
- Ministry of Transport and Communications of the Kyrgyz Republic;
- Ministry of Water Resources, Agriculture and Processing Industry of the Kyrgyz Republic;
- Ministry of Energy of the Kyrgyz Republic;
- Ministry of Natural Resources, Ecology and Technical Supervision of the Kyrgyz Republic;
- Ministry of Health of the Kyrgyz Republic;
- Ministry of Education and Science of the Kyrgyz Republic;
- Ministry of Culture, Information, Sports and Youth Policy of the Kyrgyz Republic;
- Ministry of Labour, Social Security and Migration of the Kyrgyz Republic;
- Ministry of Defense of the Kyrgyz Republic;
- Ministry of Internal Affairs of the Kyrgyz Republic;
- Ministry of Emergency Situations of the Kyrgyz Republic;
- Ministry of Digital Development of the Kyrgyz Republic;
- State Committee for National Security of the Kyrgyz Republic.

The following agencies operate under the Cabinet of Ministers of the Kyrgyz Republic:

1. State Agency for the Management of State Property
2. State Agency for Intellectual Property and Innovation
3. State Agency for Civil Service and Local Self-Government Affairs
4. State Agency for Personal Data Protection
5. State Agency for Physical Culture and Sports
6. State Agency for Civil Aviation
7. Climate Finance Center
8. Social Fund of the Kyrgyz Republic

For the purpose of providing leadership and coordination of the activities of state executive bodies, local self-government bodies, and other stakeholders, and to develop a coherent state policy in the field of climate change and the "green" economy, within the framework of the implementation of the National Development Strategy of the Kyrgyz Republic for 2018–2040 (approved by Presidential Decree of the Kyrgyz Republic of 31 October 2018, No. 221), in pursuance of Presidential Decree of the Kyrgyz Republic "On measures to ensure environmental security and climate resilience of the Kyrgyz Republic" of 19 March 2021, No. 77, and in accordance with Resolution of the Cabinet of Ministers of the Kyrgyz Republic "On matters of the State Committee on Ecology and Climate of the Kyrgyz Republic" of 19 May 2021, No. 11, as well as Articles 10 and 17 of the Constitutional Law of the Kyrgyz Republic "On the Government of the Kyrgyz Republic," the Government of the Kyrgyz Republic decided to establish a Coordinating Council on Climate Change, Ecology and Sustainable Development**,** [47] composed as follows:

1. Chair of the Cabinet of Ministers of the Kyrgyz Republic – Head of the Presidential Administration of the Kyrgyz Republic, Chair of the Coordinating Council;
2. First Deputy Chair of the Cabinet of Ministers of the Kyrgyz Republic, Deputy Chair of the Coordinating Council;
3. Minister of Natural Resources, Ecology and Technical Supervision of the Kyrgyz Republic, Deputy Chair of the Coordinating Council;
4. Head of the Department for Political and Economic Studies of the Presidential Administration of the Kyrgyz Republic, Deputy Chair of the Coordinating Council.

[47] Resolution of the Government of the Kyrgyz Republic "On the Coordinating Council on Climate Change, Environment and Sustainable Development" dated 30 January 2020, No. 46

Members of the Coordinating Council:

5. Member of the Jogorku Kenesh of the Kyrgyz Republic (subject to agreement);
6. Minister of Economy and Commerce of the Kyrgyz Republic;
7. Minister of Finance of the Kyrgyz Republic;
8. Minister of Foreign Affairs of the Kyrgyz Republic;
9. Minister of Water Resources, Agriculture and Processing Industry of the Kyrgyz Republic;
10. Minister of Emergency Situations of the Kyrgyz Republic;
11. Minister of Culture, Information, Sports and Youth Policy of the Kyrgyz Republic;
12. Minister of Energy of the Kyrgyz Republic;
13. Minister of Transport and Communications of the Kyrgyz Republic;
14. Minister of Health of the Kyrgyz Republic;
15. Minister of Labour, Social Security and Migration of the Kyrgyz Republic;
16. Minister of Education and Science of the Kyrgyz Republic;
17. Minister of Construction, Architecture and Housing and Communal Services of the Kyrgyz Republic;
18. Deputy Chair of the National Statistical Committee of the Kyrgyz Republic;
19. Deputy Chair of the National Bank of the Kyrgyz Republic;
20. President of the National Academy of Sciences of the Kyrgyz Republic;
21. Director of the National Investment Agency under the President of the Kyrgyz Republic;
22. Director of the Institute for Economic Policy Research of the Kyrgyz Republic;
23. Director of the Climate Finance Center under the Cabinet of Ministers of the Kyrgyz Republic.

This body is responsible for coordinating all activities related to the implementation and achievement of the NDC targets, as described in the relevant reporting documents of the Kyrgyz Republic. The First Biennial Transparency Report (BTR1) will also be reviewed at one of the meetings of the Coordinating Council of the Cabinet of Ministers of the Kyrgyz Republic and approved by it, unless a different decision is taken.

### 2.1.2 Population profile

According to the National Statistical Committee (NSC), as of 1 January 2024 the population of the Kyrgyz Republic was 7,161.9 thousand people.[48] The average population density was 36 persons per square kilometre. [49] The population consisted of 49.5% men (3,542.9 thousand) and 50.5% women (3,619.0 thousand). About 34.9% of the population lived in urban areas (2,496.9 thousand), while the rural population accounted for 65.2% (4,665.0 thousand).

Of the total population, 2,449.4 thousand persons (34.2%) were below working age, 4,047.0 thousand (56.5%) were of working age, and 665.5 thousand (9.2%) were above working age (see Figure 4)[50]

[48] NSC. Population. On the websitehttps://stat.gov.kg/ru/statistics/naselenie/
[49] NSC. Kyrgyzstan in Figures. Statistical Compendium. 2024.
[50] Ibid.

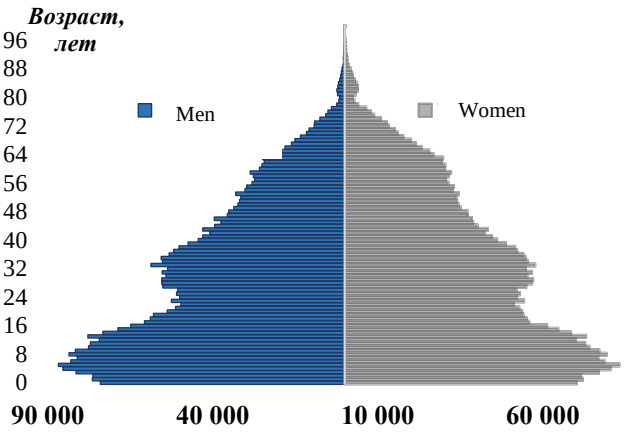



*Figure 2.1.* Age-Sex Structure of the Population of the Kyrgyz Republic at the End of 2023

In 2023, life expectancy at birth was 72.0 years for both sexes combined, 68.2 years for men, and 76.5 years for women. The average annual population growth rate in the same year was 1.8%.[51]

The median age of the population of the Kyrgyz Republic continues to increase, reaching 28.6 years at the end of 2023 (27.7 years for men and 29.5 years for women).[52] In 2023, 14,453 people arrived in the country, while 4,610 people departed, resulting in net in-migration of 9,843 persons (compared with 6,527 in 2022). Thus, in 2023 there was a decline in permanent emigration from the Kyrgyz Republic to other countries.[53]

According to the national census, more than 80 nationalities reside in the Kyrgyz Republic. Kyrgyz make up 77.8% of the population, Uzbeks – 14.2%, Russians – 3.8%, Dungans – 1.0%, Tajiks – 0.9%, Uighurs – 0.5%, Kazakhs – 0.4%, Azerbaijanis – 0.3%, Turks – 0.3%, Tatars – 0.2%, Koreans – 0.1%, among others.[54]

## 2.1.3 Geographical profile

The Kyrgyz Republic is a landlocked country located in the center of the Eurasian continent, in the northeast of Central Asia (see Figure 5). The total area of its territory is 199.9 thousand km². The extent from west to east is 900 km, and from north to south 410 km. The Kyrgyz Republic shares borders with four countries: the Republic of Kazakhstan, the People's Republic of China, the Republic of Tajikistan, and the Republic of Uzbekistan.

[51] Ibid.
[52] NSC. Demographic Yearbook of the Kyrgyz Republic. 2019–2023. 2024
[53] NSC. Demographic Yearbook of the Kyrgyz Republic. 2019–2023. 2024
[54] NSC. Kyrgyzstan in Figures. Statistical Compendium. 2024


*Figure 2.2. Map of the Kyrgyz Republic and the Kyrgyz Republic on the Map of Asia*

The Kyrgyz Republic is located within the mountain systems of the Tien Shan and the Pamir-Alai ranges. The lowest point (488 m above sea level) is the confluence of the Naryn River with the border of the Republic of Uzbekistan, while the highest point is Pobeda Peak (7,439 m). Another low point of the Kyrgyz Republic, at 394 m above sea level, is located in the Fergana Valley near the city of Osh. The average elevation of the country's territory is 2,630 m above sea level, with almost 90% of the land situated at more than 1,000 m above sea level.

The diversity of landscapes and natural and climatic conditions in the Kyrgyz Republic is grouped into four natural and climatic zones: the valley-foothill zone (up to 1,200 m), the mid-mountain zone (1,200–2,200 m), the high-mountain zone (2,200–3,500 m), and the nival zone (above 3,500 m) (Figure 5).

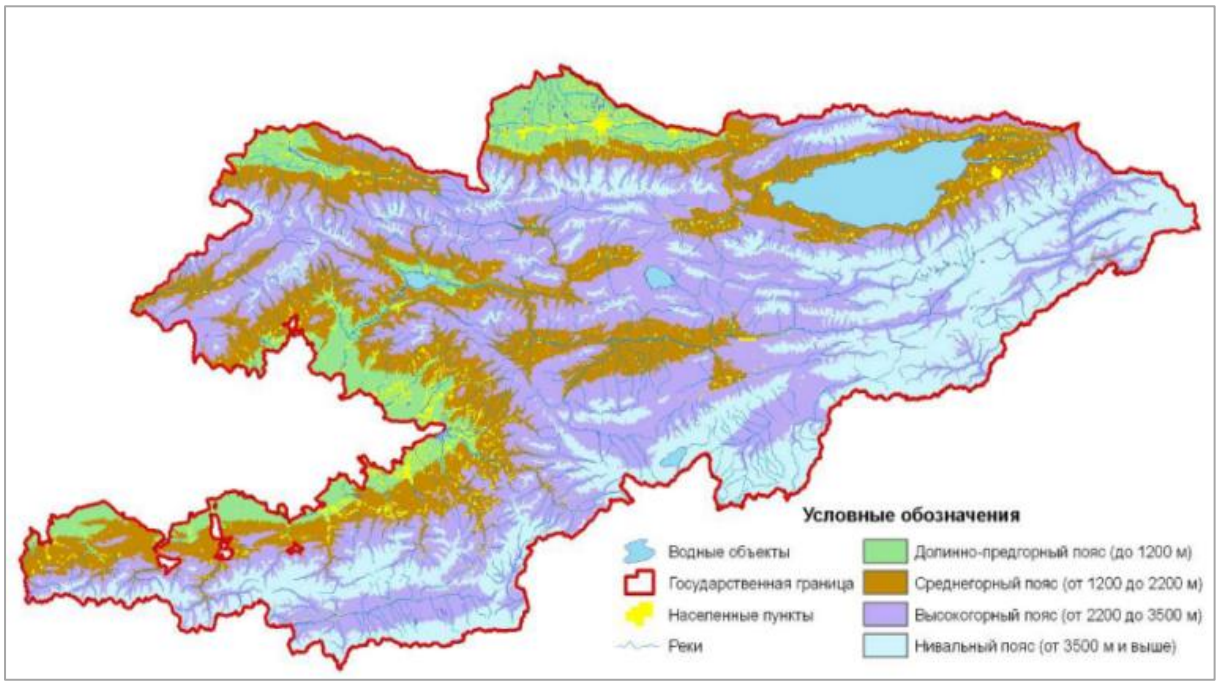


*Figure 2.3. Natural and Climatic Zoning by Altitude Above Sea Level*

Less than 20% of the territory of the Kyrgyz Republic is located in areas with comfortable living conditions. The large systems of mountain ranges, oriented in different directions, have created several regions with relatively homogeneous climates that differ significantly from one another.

In 2023, agricultural lands accounted for 33.7% of the national land balance, settlements for 1.4%, specially protected natural areas for 5.9%, forest lands for 12.7%, water resources for 3.8%, industrial, transport and other lands for 1.2%, and reserve lands for 41.2%.

In 2023, the area of arable land reached 1,286.4 thousand hectares, of which 79.7% was irrigated. [55]Between 1995 and 2023, the total arable land area decreased by 9.2%. [56]

Pastures covered 8,995.4 thousand hectares in 2023, representing almost 85% of agricultural land. Land use changes in pastures have been observed, with the pasture area of the Kyrgyz Republic decreasing by 9.2% during the period 1995–2023 by 9.2%.[57]

Kyrgyzstan is the only country in Central Asia whose water resources are formed almost entirely within its own territory. This is both a hydrological peculiarity and an advantage.

There are 9,957 glaciers in the Kyrgyz Republic, with a total area of 6,804.8 km², including 6,229 glaciers larger than 0.1 km² with a combined area of 6,615.2 km², and 3,728 glaciers smaller than 0.1 km² with a combined area of 189.6 km².

Over approximately 70 years, the glaciated area of Kyrgyzstan has decreased by 14%. The area of large glaciers declined by 16%, while the area of small glaciers increased 2.5 times (by 143%). This is associated with the general degradation of glaciation, in which the retreat of large glaciers leads not only to a reduction in their area but also to their fragmentation into smaller parts, which then function as independent small glaciers. The total number of glaciers increased by 22%, owing to a 2.5-fold increase in the number of small glaciers (less than 0.1 km²), while the number of large glaciers (greater than 0.1 km²) decreased by 7.5%.[58]

Water resources meet the needs of the country and also serve as the main source of water for large territories in downstream Central Asian countries, as well as for the Xinjiang region in northwestern China. The total available water resources of Kyrgyzstan are estimated at 2,458 km³, including 650 km³ (26.4%) stored in glaciers, 1,745 km³ in lakes (71%), about 13 km³ of potential reserves of underground freshwater and mineral-thermal waters (0.5% or 10,545.2 thousand m³), and between 44.5 and 51.9 km³ of average annual river runoff (2%). The total annual volume of renewable water resources is estimated at 46.5 km³.[59]

Kyrgyzstan has more than 3,500 rivers of various lengths, including 30 large rivers. The average long-term surface runoff of rivers formed within the country amounts to 44.5 billion m³/year (44.5 km³), or 47.2 km³ including return flows. However, under the Almaty Agreement on Cooperation in the Field of Joint Water Resources Management of 1992, Kyrgyzstan is entitled to use only 25% (11–12 km³ out of 44.5 km³) of the surface water resources formed in its territory. The remaining 75–80% is transit flow for the downstream basins of Uzbekistan, Kazakhstan, China and Tajikistan.[60]

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[55] NSC. Environment in the Kyrgyz Republic. 2019–2023. Bishkek.

[56] NSC. Environment in the Kyrgyz Republic. 2000–2006. Bishkek.
https://stat.gov.kg/ru/publications/sbornik-okruzhayushaya-sreda-v-kyrgyzskoj-respublike/

[57] Ibid.

[58] CAIAG. Catalogue of Glaciers of the Kyrgyz Republic. Bishkek, 2018 / Edition 01/2024.

[59] Data of the Water Resources Service of the Kyrgyz Republic
https://www.water.gov.kg/index.php?option=com_k2&view=item&id=1720:vodnye-resursy-kyrgyzskoj-respubliki-v-obektive-nisi-kr&lang=ru

[60] Ibid.

According to the National Forest Inventory (2008–2010), the forest area of the Kyrgyz Republic amounted to 1,116.56 thousand hectares, or 5.6% of the total area of the country. Under natural conditions, 30 tree species typical of temperate latitudes occur, including coniferous, hardwood, softwood, nut-bearing, fruit-bearing, pome fruit and stone fruit species, as well as more than 17 types of shrubs.

### *2.1.3.1 Fuel and Energy Resources and Their Development Assessment*

Coal resources. To date, 48 coal deposits have been identified in the Kyrgyz Republic, concentrated in the South Fergana, Uzgen, North Fergana, Kavak and Torugart, as well as Issyk-Kul coal basins, with total reserves estimated at 1.7 billion tonnes. These include 1.2 billion tonnes of brown coal, 327.8 million tonnes of hard coal, and 120.9 million tonnes of coking coal. By region, reserves are distributed as follows: Jalal-Abad – 299.8 million tonnes, Osh – 272.9 million tonnes, Batken – 462.4 million tonnes, Issyk-Kul – 27.4 million tonnes, and Naryn – 626.5 million tonnes.

Oil and gas resources. Industrial reserves are limited: oil reserves are estimated at 88.5 million tonnes, with recoverable reserves of 11.2 million tonnes; natural gas reserves amount to 5,578.9 million m³. These reserves are concentrated in the south of the country across seven deposits, of which five are located in Jalal-Abad region and two in Batken region. The level of development remains extremely low (0.07% for oil and 0.6% for gas) due to the lack of financial resources for production drilling. At the exploration stage, the expected additional reserves are estimated at 1.3 billion m³ of gas and 300,000 tonnes of oil.

Hydropower resources. According to the Institute of Water Problems and Hydropower of the National Academy of Sciences of the Kyrgyz Republic, hydropower resources are estimated at 245.2 billion kWh, of which 142.5 billion kWh are technically feasible for development, and 60 billion kWh represent the economic (production) potential. The level of development is 6% of the gross potential, 10% of the technical potential, and 24% of the economic potential. [61]

Hydropower potential is concentrated in the basins of the Naryn River (36%), the Fergana Valley (27%), the Sary-Jaz River (10.7%), and the Chu River (9%). Among them, the most promising are the Naryn River basin, with an estimated capacity of 6,970 MW, and the Sary-Jaz River basin, with an estimated capacity of 993 MW.[62]

The most developed is the lower course of the Naryn River, where the Lower Naryn cascade of hydropower plants operates, including reservoirs with long-term regulation (Toktogul) and daily regulation (Kurpsai, Tash-Kumyr, Shamaldysai and Uch-Kurgan). Electricity generation depends on the natural and climatic conditions and water availability in the Naryn River basin and its tributaries, with low- and high-water cycles alternating every 3–4 years. [63]

Renewable Energy Sources (RES). These include the hydropower potential of small rivers and streams, solar energy potential, wind energy, geothermal heat and waters, which could effectively and substantially replace fossil fuels in the energy mix.

The total gross hydropower potential of small rivers and streams in the Kyrgyz Republic is estimated at 9,402 MW, with an average annual electricity generation potential of 80 billion kWh. Only 5–10% of this is considered technically feasible, amounting to 5–8 billion kWh of possible annual generation. At present, the level of development is estimated at 0.023%.

The hydropower potential of irrigation reservoirs is 56.7 MW, with an estimated electricity generation of 248 million kWh. Most small rivers are concentrated in the basins of the Chu, Talas, Naryn, Sary-

[61] National Energy Program of the Kyrgyz Republic until 2035. Resolution of the Cabinet of Ministers of the Kyrgyz Republic dated 12 April 2024, No. 172
[62] Ibid.
[63] Ibid.

Jaz and Kara-Darya rivers. By territory, the highest potential is located in Osh region – 23.2 billion kWh, Issyk-Kul region – 17.4 billion kWh, Naryn region – 17.8 billion kWh, Chui region – 5.5 billion kWh, and Talas region – 31 billion kWh.[64]

Solar energy. The climate of the Kyrgyz Republic is characterized by high solar irradiation, with 2,500 to 2,800 hours of sunshine per year. Practically all densely populated valleys of the country are suitable for the effective introduction of solar heating systems, where total solar radiation exceeds 1.3 Gcal per m² of surface.

The wind energy potential is estimated by experts at 44.6 million kWh per year. A reassessment, conducted under the USAID project, indicated significant regional variations: Batken region (Dostuk zone) – 1,505 MW over 300 m²; Jalal-Abad region (Tash-Kumyr zone) – 280 MW over 56 m²; Naryn region (Torugart zone) – 815 MW over 163 m², and Orto-Tokoi zone – 135 MW over 27 m²; Issyk-Kul region (Boom Gorge) – 490 MW over 98 m², and Tash-Koroo zone – 485 MW over 97 m².[65]

Deposits of geothermal waters are mainly used for therapeutic purposes, and only partially for heating at resorts such as Jergalan, Ak-Suu and Issyk-Ata. Earlier studies demonstrated that geothermal heating schemes in all prospective areas are more cost-effective than solid-fuel boiler systems.

According to climate change project experts, the biomass energy potential is considerable, estimated at 1.3 billion kWh of possible annual electricity generation.[66]

### 2.1.4 Economic Profile

The results of the socio-economic development of the Kyrgyz Republic in the period 2021–2023 under conditions of global uncertainty demonstrated strong performance. Average economic growth over the past three years was 6.9% (2021 – 105.5%, 2022 – 109.0%, 2023 – 106.2%),[67] reflecting the resilience of the economy and its gradual adaptation to the post-COVID situation and the current geopolitical environment. These included disruptions in supply chains, sanctions, volatility in commodity and financial markets, increased production costs, and global inflationary pressures. The positive dynamics were underpinned by the successful implementation of a set of measures to stimulate economic sectors, effective resource management, and fiscal reforms.

The main outcome of the socio-economic development of the Kyrgyz Republic in 2021–2023 was the maintenance of macroeconomic stability and the timely fulfillment of all planned state commitments in the areas of social protection and pension provision.

In 2023, the GDP of the Kyrgyz Republic amounted to 1,333,730 million soms (USD 15,173.30 million)[68]. The contribution of sectors to GDP is presented in Figure 2.1.

[64] Ibid.
[65] Ibid.
[66] Ibid.
[67] Ministry of Economy and Commerce of the Kyrgyz Republic. Information on the Results of the Socio-Economic Development of the Kyrgyz Republic for January–December 2023 and the Tasks for 2024.

[68] NSC. GDP by Type of Economic Activity. https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fstat.gov.kg%2Fru%2Fstatistics%2Fdownload%2Fdynamic%2F333%2F&wdOrigin=BROWSELINK

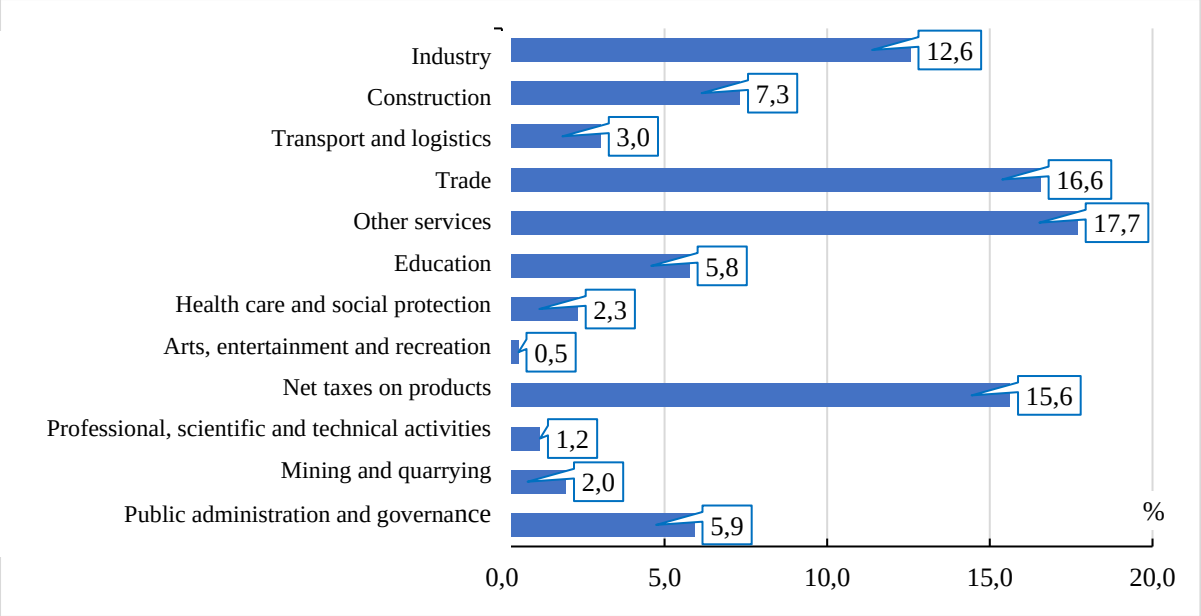


*Figure 2.4. Gross Domestic Product (GDP) by Type of Economic Activity in 2023*[69]

### *2.1.4.1 Industry*

In 2023, industrial enterprises produced gross output worth 495,344 million soms. The index of physical production volume increased by 113.7% compared with 2022, and by 133.7% compared with 2021.[70]

In manufacturing, which accounted for the largest share of total industrial production (77.3%), the output in 2023 reached 383,090.0 million soms, with the index of physical production volume reaching 136.2% compared with 2021.[71]

The largest contribution to the gross output of manufacturing in 2023 came from the production of basic metals and fabricated metal products, excluding machinery and equipment, which represented 59.1% of total manufacturing. The share of food production (including beverages) and tobacco products amounted to 19.4%; rubber and plastic products and non-metallic mineral products accounted for 11.2%; textiles, wearing apparel, leather and related products accounted for 4.5%; coke and refined petroleum products for 1.6%; wood and paper products, and printing activities for 1.2%; machinery and equipment production, repair and installation for 1%; while computers and electronic equipment, chemicals and pharmaceutical products, and transport equipment together accounted for 2% of total manufacturing.

The growth of industrial production volumes was driven by an increase in the output of rubber, plastic products and construction materials (1.7 times), pharmaceutical products (by 34.9%), textiles, wearing apparel, leather and related products (by 19.2%), wood and paper products and printing activities (by

[69] NSC. GDP by Type of Economic Activity. https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fstat.gov.kg%2Fru%2Fstatistics%2Fdownload%2Fdynamic%2F333%2F&wdOrigin=BROWSELINK
[70] NSC. Volume of Industrial Production by Type of Economic Activity. https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fstat.gov.kg%2Fru%2Fstatistics%2Fdownload%2Fdynamic%2F340%2F&wdOrigin=BROWSELINK
[71] According to the data of the National Statistical Committee: https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fstat.gov.kg%2Fru%2Fstatistics%2Fdownload%2Fdynamic%2F340%2F&wdOrigin=BROWSELINK

19.6%), chemical products (by 11.8%), refined petroleum products (by 8.9%), food products (including beverages) and tobacco products (by 5.7%), computers, electronic and optical equipment (1.6 times), and transport equipment (by 6.1%). [72]

### *2.1.4.2 Mining*

In 2023, the mining sector accounted for 11.4% of total industrial production. The gross output of mining products amounted to 56,391.7 million soms, representing an increase of 133.2% compared with 2021 and 119.7% compared with 2022.[73]

In 2023, the output of coal and lignite reached 8,075.3 million soms, or 14.3% of total mining output. Crude oil and natural gas production amounted to 10,671.1 million soms, or 18.9% of total mining output. Metallic ore production reached 35,431.0 million soms, accounting for 62.8% of total mining, while other non-metallic minerals totaled 2,214.3 million soms, or 3.9%. The physical production index compared with 2021 was 184% for coal, 141.2% for oil and gas, and 119.9% for non-metallic ores.[74]

The increase in mining output in 2023 compared with 2022 was primarily driven by coal production, which rose by 402 thousand tonnes (10.6%), and crude oil production, which increased by 8 thousand tonnes (2.7%). At the same time, natural gas production in 2023 decreased by 2.5 million m³ compared with 2022.[75]

### *2.1.4.3 Electricity, Gas, Steam and Air Conditioning Supply*

Electricity generation in 2023 amounted to 13,839.3 million kWh, compared with 15,138.0 million kWh in 2021 (a decrease of 8.6%) and 13,882.5 million kWh in 2022 (a decrease of 0.3%). The reduction was due to a low-water period (see Table 2.1).

*Table 2.1. Electricity and heat generation, 2021–2023.* [76]

| Indicator | Unit | 2021 | 2022 | 2023 |
|---|---|---|---|---|
| Total electricity generation | million kWh | 15,138.0 | 15,138.0 | 15,138.0 |
| Hydropower generation | million kWh | 12,957.1 | 12,957.1 | 12,957.1 |
| Thermal power generation | million kWh | 2,180.9 | 2,180.9 | 2,180.9 |
| Heat generation | thousand Gcal | 3,138.6 | 3,138.6 | 3,138.6 |

Electricity and heat generation is carried out at hydropower plants (HPPs) and thermal power plants (TPPs) (see Figure 2.5 below).

The share of each type of generation in the electricity balance of the Kyrgyz Republic varies depending on a range of technological and climatic factors. The latter include the following:

[72] Ibid.
[73] NSC. Volume of Industrial Production by Type of Economic Activity. https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fstat.gov.kg%2Fru%2Fstatistics%2Fdownload%2Fdynamic%2F340%2F&wdOrigin=BROWSELINK
[74] NSC. Volume of Industrial Production by Type of Economic Activity. https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fstat.gov.kg%2Fru%2Fstatistics%2Fdownload%2Fdynamic%2F340%2F&wdOrigin=BROWSELINK
[75] According to the NSC. Volume of hard coal and lignite production. Volume of oil production. Volume of gas production.https://stat.gov.kg/ru/statistics/promyshlennost/
[76] NSC. Fuel and Energy Balance for 2023.https://stat.gov.kg/ru/publications/toplivno-energeticheskij-balans/

1. *Precipitation and snowmelt regime.* These have a direct impact on the volume of water in rivers and reservoirs, which in turn directly affects electricity generation. In dry and hot climatic conditions, when precipitation decreases, the water level in rivers or reservoirs may drop significantly, leading to reduced HPP capacity.
2. *Air temperature.* High temperatures can cause intensive melting of snow and glaciers, which increases river flows and ensures high hydropower productivity. However, if temperatures rise excessively, this may result in declining river levels and reduced electricity generation.
3. *Instability of river hydrological regimes.* Increased frequency of extreme weather events and a higher risk of flooding can reduce the efficiency of HPPs and lower overall electricity generation.

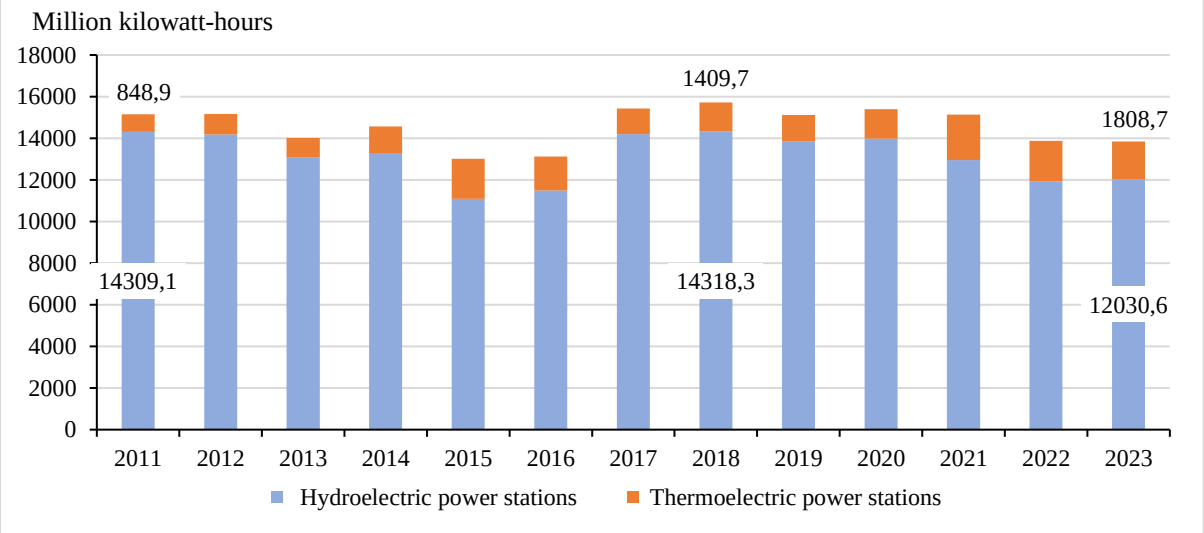


*Figure 2.5. Electricity Generation by Power Plants (%)*

For the purpose of the rational use of water and energy resources and to prevent the depletion of the Toktogul Reservoir below the permissible level, as well as to cover the electricity deficit in the power system of the Kyrgyz Republic, agreements were concluded with the Republic of Kazakhstan and the Republic of Uzbekistan on electricity exchange.

### *2.1.4.4 Water Supply, Wastewater Treatment, Waste Management and Secondary Raw Materials Recovery*

The volume of water supply, wastewater treatment, waste management and secondary raw materials recovery (accounting for 1.0% of total industrial production) amounted to 4,861.2 million soms in 2023, representing an increase of 20.2% compared with 2021 and 10.6% compared with 2022 (see Table 2.2).[77]

Solid waste management falls under the responsibility of local self-government bodies (village administrations and city municipalities). In 2023, there were 829 operating entities in the country engaged in water supply, wastewater treatment, waste management and secondary raw materials recovery.[78]

[77] NSC. Industrial Output by Type of Economic Activity.. https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fstat.gov.kg%2Fru%2Fstatistics%2Fdownload%2Fdynamic%2F340%2F&wdOrigin=BROWSELINK
[78] NSC. Statistical Yearbook of the Kyrgyz Republic 2019–2023. Bishkek, 2024.

*Table 2.2. Output and growth dynamics of the sector*[79]

| Activity | 2020 | 2020 | 2020 | 2020 |
|---|---|---|---|---|
| Water supply, wastewater treatment, waste management and secondary raw materials recovery | 1,732.5 | 1,732.5 | 1,732.5 | 1,732.5 |
| Growth rate compared with the previous year, % | 126.2 | 126.2 | 126.2 | 126.2 |

### *2.1.4.5 Agriculture*

At the beginning of 2023, the Kyrgyz Republic had 10,597.5 thousand hectares of agricultural land, of which 1,286.4 thousand hectares were arable land and 9,199.3 thousand hectares were pastures. The dynamics of agricultural land areas are relatively stable, with little change in size (see Table 2.3).

*Table 2.3. Dynamics of agricultural land areas, 2020–2023.*[80]

| Year | Agricultural land | Arable land | Pastures |
|---|---|---|---|
| **2020** | 10, 607.7 | 1,287.4 | 9,174.3 |
| **2021** | 10,606.1 | 1, 287.3 | 9,207.4 |
| **2022** | 10,604.6 | 1,287.0 | 9,374.5 |
| **2023** | 10,597.5 | 1,286.4 | 9,199.3 |

As a result of the agrarian and land reform of the 1990s, agriculture in Kyrgyzstan became diversified, with multiple forms of ownership. In 2023, there were about 487,701 agricultural entities, including 32 state-owned enterprises, 730 collective farms (31 joint-stock companies, 132 collective peasant farms, and 567 agricultural cooperatives), 361,497 peasant (farm) households, and 125,443 individual entrepreneurs. In addition, there were 129 forestry entities and 328 fish farms.[81]

In 2023, gross agricultural output amounted to 378.7 billion soms, with a real growth rate of 100.6% compared with 2022 (in 2022, growth was 7.3% compared with 2021). In the overall structure of agricultural production, livestock accounted for 47.9%, crop production for 48.4%, forestry for 0.1%, fish farming for 1.2%, and agricultural services for 2.4%. Growth in gross agricultural output was driven by an increase in livestock production (up by 2.3%), mainly due to higher production of meat (up by 1.7%), milk (up by 2.5%), and eggs (up by 12.8%).[82]

Constraining factors included a decline in gross crop output (down by 1.9%) due to lower harvests of wheat (down by 25.7%), barley (down by 29.2%), pulses (down by 10.2%), and oilseed crops (down by 16.1%).[83]

n 2023, cereals (excluding pulses, rice, and buckwheat) were harvested from 585.1 thousand hectares, an increase of 1.7% compared with the previous year. However, total grain harvest amounted to 1.6 million tonnes, which was 13.0% lower. The decline was caused by a decrease in cereal yields, which fell by almost 14.6% compared with 2022.

[79] NSC. Industrial Output by Type of Economic Activity.. https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fstat.gov.kg%2Fru%2Fstatistics%2Fdownload%2Fdynamic%2F340%2F&wdOrigin=BROWSELINK
[80] CCC
[81] NSC. Statistical Yearbook of the Kyrgyz Republic 2019–2023. Bishkek, 2024.
[82] Ministry of Economy and Commerce of the Kyrgyz Republic. Information on the Results of the Socio-Economic Development of the Kyrgyz Republic for January–December 2023 and the Tasks for 2024. 96113908dd6fba3bdb7f16c9ee7ae0c4e27b8c0e.pdf
[83] Ministry of Economy and Commerce of the Kyrgyz Republic. Information on the Results of the Socio-Economic Development of the Kyrgyz Republic for January–December 2023 and the Tasks for 2024. 96113908dd6fba3bdb7f16c9ee7ae0c4e27b8c0e.pdf

According to experts, the annual demand for mineral fertilizers in Kyrgyzstan exceeds 350,000 tonnes, including 200,000 tonnes of nitrogen, 130,000 tonnes of phosphorus, and 11,000 tonnes of potassium. However, only about 100,000 tonnes are imported each year, mainly nitrogen fertilizers, with very limited phosphorus fertilizers and virtually no potassium fertilizers in recent years. [84] Since Kyrgyzstan has no domestic fertilizer production, the country relies entirely on imports. In 2023, fertilizer imports amounted to USD 51.4 million, 21.5% lower than in 2022, but 187% higher than in 2021 and 39.3% higher than in 2020. [85]

The decline in crop yields in 2023 was influenced by abnormally high summer temperatures during the growing season and a shortage of irrigation water due to adverse natural conditions. Temperature fluctuations in spring also affected the ripening periods of pulses and oilseed crops. As a result, in 2023 pulses were harvested from 53.6 thousand hectares, 10.4% less than in 2022; oilseed crops were harvested from 15.3 thousand hectares, 22.6% less; and cotton was harvested from 17.6 thousand hectares, 16.3% less. At the same time, increases were recorded in gross harvests of sugar beet (up by 32.7% compared with the previous year), tobacco (up by 19.2%), maize for grain (up by 9.2%), melons (up by 4.2%) and vegetables (up by 4.6%). [86]

As a result of climatic impacts in 2023, 1,912 hectares of cereal crops were lost, including 1,178 hectares of wheat, 667 hectares of barley, 5 hectares of maize for grain, 16 hectares of oats, and 46 hectares of sorghum. The main causes of these crop losses were adverse rainfed conditions with low germination rates, as well as the exposure of these areas to natural hazards such as hail, mudflows, heatwaves, and frosts.[87]

Agricultural lands in Kyrgyzstan are rarely treated with mineral fertilizers or chemical agents. While this has left the soils largely free from chemical residues, it has also resulted in their severe depletion.

In this context, the country has recognized both the need and the opportunity to introduce alternative approaches to agricultural production. Organic farming is therefore being actively promoted as a viable solution to the current situation (see Table 2.4).

In organic agriculture, priority is given to providing crops with organic nutrients and to controlling pests and weeds through biological methods. Practices include the wider use of crop rotation, organic fertilizers (manure, compost, crop residues, green manure, etc.), and various soil cultivation techniques.

Organic farming relies on domestic resources, incorporates traditional national agricultural practices, improves soil fertility, conserves biodiversity, and, most importantly, avoids pollution of the environment.

*Table 2.4. Indicators of Organic Agriculture Development in the Kyrgyz Republic*[88]

| Indicator | 2022 | 2023 | 2023 vs. 2022 |
|---|---|---|---|
| 1. Number of organic farms, units | 1,581 | 1,662 | 81 |

[84] Zhumabekov E.Zh., Yzakhanov T.Zh., Musaeva A.P. Fertilizers – the Basis of Soil Fertility and Crop Yield. // Proceedings of Universities of the Kyrgyz Republic, No. 6, 2022.
[85] NSC. Foreign Trade. Import of Main Types of Goods.. https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.stat.gov.kg%2Fru%2Fstatistics%2Fdownload%2Fdynamic%2F1233%2F&wdOrigin=BROWSELINK
[86] NSC. Foreign Trade. Import of Main Types of Goods.https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.stat.gov.kg%2Fru%2Fstatistics%2Fdownload%2Fdynamic%2F1233%2F&wdOrigin=BROWSELINK
[87] Ministry of Economy and Commerce of the Kyrgyz Republic. Information on the Results of the Socio-Economic Development of the Kyrgyz Republic for January–December 2023 and the Tasks for 2024. 96113908dd6fba3bdb7f16c9ee7ae0c4e27b8c0e.pdf
[88] Draft Program for the Development of Organic Production in the Kyrgyz Republic for 2025–2029. Unified Public Discussion Portal. https://koomtalkuu.gov.kg/ru/view-npa/4707

| Indicator | 2022 | 2023 | 2023 vs. 2022 |
|---|---|---|---|
| – Area under organic farming, ha | 62,661 | 65,853 | 3,192 |
| – Share of organic area in total arable land, % | 4.8 | 5.1 | 0.3 |
| 2. Volume of organic production, tonnes, including: | 408,510 | 210,994 | -197,516 |
| – Crop production | 397,859 | 204,440 | -193,419 |
| – Livestock production | 10,651 | 6,554 | -4,097 |
| 3. Gross value of organic production, million soms | 39,374 | 41,823 | 2,449 |
| 4. Share of organic production in total agricultural output, % | 10.9 | 11.0 | +0.1 |
| 5. Export of organic products, tonnes | 4,556.5 | 6,392.0 | 1,835.5 |
| Export of organic products, million soms | 5,565.2 | 4,246.9 | -1,318.3 |
| 6. Share of organic products in total agricultural exports, % | 15.0 | 12.9 | -2.1 |
| 7. Production of biological plant protection products, million soms | 2.3 | 1.4 | -0.9 |
| 8. Area treated with biological plant protection products, ha | 49,681.9 | 37,700.0 | -11,981.9 |

According to Table 2.4, there is a clear trend of organic farming development in the Kyrgyz Republic. As of 2023, the number of organic farms increased by 81 units, and the area under organic farming expanded by 3.2 thousand hectares compared with 2022, reaching 65.9 thousand hectares, or 5.1% of total arable land.

The gross value of organic production also showed positive dynamics, increasing by 2.4 billion soms compared with 2022. In 2023, organic production accounted for 11% of total agricultural output.

The most dynamic subsector of organic farming is crop production, which represents about 96.5% of the country's total organic output. Organic crops include apricots, plums, walnuts, beans, cotton, medicinal herbs, and wild capers.

The livestock subsector remains marginal within organic farming, accounting for about 3.5% of total organic production, represented mainly by products such as honey and yak meat.

In 2023, exports of organic products decreased by 2.1% compared with 2022, with their share in total agricultural exports amounting to 12.9%.[89]

In the same year, gross output of agriculture, forestry and fisheries in the Kyrgyz Republic totaled 382,036.6 million soms at current prices. This included 191,624.2 million soms from livestock, 183,113.1 million soms from crop production, 9,496.0 million soms from agricultural services, 1,169.7 million soms from forestry, 38.4 million soms from hunting, and 6,593.2 million soms from fisheries.[90]

The larger share of gross livestock output reflects the historically established rural lifestyle of the people of Kyrgyzstan, which largely preserves nomadic traditions. As a result, the number of livestock and poultry continues to grow (see Table 2.5).

*Table 2.5. Livestock and Poultry Numbers by All Categories of Farms in the Kyrgyz Republic.*[91]

[89] Draft Program for the Development of Organic Production in the Kyrgyz Republic for 2025–2029. Unified Public Discussion Portal.https://koomtalkuu.gov.kg/ru/view-npa/4707
[90] NSC. Agriculture of the Kyrgyz Republic 2019–2023. Annual Publication. Bishkek, 2024.
[91] NSC. Livestock and Poultry Population by All Categories of Farms of the Kyrgyz Republic. https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.stat.gov.kg%2Fru%2Fstatistics%2Fdownload%2Fdynamic%2F362%2F&wdOrigin=BROWSELINK

| Indicator | 1990 | 1995 | 2000 | 2005 | 2010 |
|---|---|---|---|---|---|
| Cattle | 699.152 | 398.1745 | 423.224 | 509.63 | 632.375 |
| Dairy cows | 506.159 | 470.834 | 523.797 | 565.134 | 666.45 |
| Pigs | 393.447 | 113.8709 | 101.053 | 77.786 | 59.791 |
| Sheep and goats | 9,969.374 | 4,274.898 | 3,799.191 | 3,876.002 | 5,037.715 |
| Horses | 312.676 | 308.1682 | 353.86 | 345.174 | 378.448 |
| Poultry | 13,914.67 | 2,031.782 | 3,063.672 | 4,278.987 | 4,749.854 |
| **Indicator** | **2015** | **2020** | **2021** | **2022** | **2023** |
| Cattle | 735.094 | 860.726 | 881.647 | 897.796 | 900.055 |
| Dairy cows | 757.423 | 855.05 | 868.82 | 885.673 | 902.244 |
| Pigs | 50.345 | 29.465 | 29.508 | 25.64 | 29.676 |
| Sheep and goats | 5,929.529 | 6,278.736 | 6,278.104 | 6,200.961 | 6,216.125 |
| Horses | 449.614 | 539.644 | 547.253 | 533.979 | 542.527 |
| Poultry | 5,586.212 | 6,070.443 | 5,924.734 | 6,368.695 | 6,988.968 |

According to Table 2.5, in 2023 the number of cattle increased by 28.7% compared with 1990, dairy cows by 78.3%, and horses by 73.5%. At the same time, the number of pigs decreased by 92.5%, sheep and goats by 37.6%, and poultry by 49.8%. The dynamics in recent years (2020–2023) show growth across almost all categories: cattle increased by 4.6%, dairy cows by 5.5%, pigs by 0.7%, horses by 0.5%, and poultry by 15.1%. The only exception was sheep and goats, whose numbers declined by 1% during the same period. The production of major types of agricultural products by all categories of farms is presented in Table 2.6.[92]

*Table 2.6. The production of major types of agricultural products*

| Product | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|
| Grain (after processing) | 1,856.0 | 1,329.1 | 1,867.3 | 1,623.8 |
| Raw cotton (standard weight) | 72.8 | 66.9 | 76.5 | 63.5 |
| Tobacco (standard weight,) | 1.0 | 1.1 | 1.2 | 1.5 |
| Sugar beet (factory weight) | 448.8 | 365.6 | 468.1 | 621.0 |
| Potatoes | 1,327.2 | 1,289.1 | 1,275.0 | 1,286.8 |
| Vegetables | 1,131.2 | 1,114.1 | 1,163.6 | 1,216.6 |
| Meat (slaughter weight) | 230.4 | 235.0 | 248.3 | 252.5 |
| Raw milk | 1,668.0 | 1,698.9 | 1,734.1 | 1,777.6 |
| Eggs | 562.0 | 564.2 | 607.9 | 685.7 |
| Wool (physical weight) | 13.1 | 13.1 | 12.9 | 12.9 |

In order to provide state support to agricultural entities, preferential loans continued to be allocated under the “Agricultural Financing” (AF-11) Project in 2023. During the year, loans amounting to 3.3 billion soms were provided to 7,331 beneficiaries under the implementation of AF-11.[93]

[92] NSC. Agriculture of the Kyrgyz Republic 2019–2023. Annual Publication. Bishkek, 2024.
[93] Ministry of Economy and Commerce of the Kyrgyz Republic. Information on the Results of the Socio-Economic Development of the Kyrgyz Republic for January–December 2023 and the Tasks for 2024. 96113908dd6fba3bdb7f16c9ee7ae0c4e27b8c0e.pdf

### *2.1.4.6 Construction*

The construction sector continued to show growth in capital investment volumes. In 2023, total investment in fixed capital from all financing sources amounted to 168.5 billion soms, an increase of 18.8% (compared with a 4.0% increase in 2022). The growth in fixed capital investment compared with 2022 was driven by a 34.6% increase in domestic financing sources, while external financing decreased by 26.3%.[94]

The majority of investments (83% of the total) were directed towards the construction of facilities in mining, manufacturing, electricity, gas, steam and air conditioning supply, wholesale and retail trade, transport and storage, education, as well as residential housing. In 2023, 13,755 houses and apartments with a total area of 1,360.5 thousand m² were commissioned. It should be noted that all new multi-apartment housing and social infrastructure in Kyrgyzstan is being constructed in compliance with energy-efficient building codes and standards.

In 2023, approximately 54.2 billion soms were invested in housing construction, representing an increase of 6.4% compared with 2022. The share of investment in housing construction in total fixed capital investment was 32.2% (compared with 35.9% in 2022). Based on the overall level of economic capitalization, the total gross output of construction in January–December 2023 amounted to 198.0 billion soms, an increase of 10.3% (compared with 9.1% growth in 2022). The share of the construction sector in GDP was estimated at 6.6%.[95]

### *2.1.4.7 Services Sector*

In the Kyrgyz Republic, the services sector continues to occupy a dominant position in GDP structure, accounting for more than 50%. The average real growth rate in this sector over the past three years was 6.6% (2021 – 106.9%, 2022 – 106.8%, 2023 – 106.2%), indicating stable economic activity in services following a sharp decline of 7.9% in the COVID-19 year of 2020, and demonstrating strong recovery dynamics. [96]

In 2023, gross output of the services sector amounted to 1,005.0 billion soms, representing an increase of 7.3% compared with 2022. The contribution of the services sector to overall economic growth was the largest among all sectors and is estimated at 3.14 percentage points. The largest share within the services sector was generated by wholesale and retail trade (35.0%), transport services (8.0%), and financial intermediation and insurance services (9.9%).[97]

In addition, other key segments include education and healthcare services, hotel and restaurant activities, information and communications, real estate operations, scientific and technical activities, arts, entertainment and recreation, activities of private households with employed persons, as well as the production of diverse goods and services by households for own consumption. The functioning of these activities ensures a broad diversity of services, contributing both to the country's economic development and to the improvement of population well-being. The development of these areas is supported by rising household incomes, the expansion of small and medium-sized businesses, the growth of tourism, and the integration of digital technologies.

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[94] Ministry of Economy and Commerce of the Kyrgyz Republic. Information on the Results of the Socio-Economic Development of the Kyrgyz Republic for January–December 2023 and the Tasks for 2024. 96113908dd6fba3bdb7f16c9ee7ae0c4e27b8c0e.pdf

[95] Ministry of Economy and Commerce of the Kyrgyz Republic. Information on the Results of the Socio-Economic Development of the Kyrgyz Republic for January–December 2023 and the Tasks for 2024.

[96] Ibid.

[97] Ministry of Economy and Commerce of the Kyrgyz Republic. Information on the Results of the Socio-Economic Development of the Kyrgyz Republic for January–December 2023 and the Tasks for 2024.

Over the period 2022–2023, household monetary incomes increased by more than 40%. In 2023, the average monthly nominal wage rose by 20.3% compared with 2022, while the average pension increased by 18.1%, and the average monthly social allowance doubled. [98]

A significant easing of restrictions compared with previous years supported the recovery of import operations. Thus, in 2022 imports grew by 1.7 times, and in 2023 imports of goods increased by 26.0% over the twelve-month period.[99] These factors, in turn, stimulated domestic demand, which contributed to growth in wholesale and retail trade, transport services, cargo storage, and related activities.

The gross output of wholesale and retail trade, and the repair of motor vehicles and motorcycles, amounted to 351.7 billion soms in 2023, reflecting a growth rate of 115.5%. The increase was driven mainly by a 23.0% growth in wholesale trade and a 10.9% growth in retail trade compared with 2022. The volume of transport services and cargo storage reached 80.5 billion soms in 2023, an increase of 7.3%.[100]

In total, 51.0 million tonnes of cargo were transported by all modes of transport, representing an increase of 15.3% compared with 2022, while passenger transport services carried 574.7 million passengers, 9.1% more than in 2022. The volume of services provided by hotels and restaurants in 2023 amounted to 43.3 billion soms, with a growth rate of 123.0%. [101]

### 2.1.5 Climate Profile

The climate of the Kyrgyz Republic, as in any other territory, is determined by its geographical location and is shaped by the interaction of three principal factors: solar radiation, atmospheric circulation, and the underlying surface.

The location of the Kyrgyz Republic in the center of the largest continent of Eurasia, its remoteness from significant water bodies, and its proximity to deserts define the continental arid character of the climate. This pattern is somewhat moderated by the country's elevated hypsometric position, which results in increased cloudiness and precipitation, as well as in a reduced amplitude of the annual air temperature cycle compared to adjacent lowland areas. The greater part of the territory of the Kyrgyz Republic lies within the temperate climatic zone, while its southern regions are located in the subtropical zone.

Solar radiation reaching the Earth's surface constitutes one of the main climate-forming factors. Its intensity is determined by the altitude of the Sun above the horizon, which varies from 23–25° in December to 69–70° in June. The duration of sunshine is influenced by cloud formation processes and horizon obstruction. In narrow valleys and gorges, the duration of sunshine is shorter compared to other landforms situated at the same latitudes. In the narrow valleys of Chon-Kyzyl-Suu and Jeti-Oguz, the average annual duration of sunshine is 1,700–1,800 hours, whereas in open areas it reaches 2,500–2,900 hours. In July, the duration of sunshine increases from 180 hours in the narrow valleys of the northeastern part of the Kyrgyz Republic to 365 hours in the Fergana and Chatkal Valleys; in December, from 85 hours in narrow valleys to 200 hours in the open territories of the syrts. [102]

[98] Ministry of Economy and Commerce of the Kyrgyz Republic. Information on the Results of the Socio-Economic Development of the Kyrgyz Republic for January–December 2023 and the Tasks for 2024. 96113908dd6fba3bdb7f16c9ee7ae0c4e27b8c0e.pdf
[99] Ibid.
[100] Ibid.
[101] Ibid.
[102] Ministry of Emergency Situations (MES) of the Kyrgyz Republic. Monitoring and Forecasting of Hazardous Processes and Phenomena in the Territory of the Kyrgyz Republic (20th Edition, revised and supplemented). Bishkek, 2023. – 848 p.

With increasing altitude, the annual amount of solar radiation under average cloudiness conditions rises from 5,547 MJ/m² in the Chui Valley (Bishkek meteorological station, 756 meters above sea level) to 6,660 MJ/m² in the syrt zone (Tien Shan meteorological station, 3,610 meters above sea level). The increase in solar radiation with altitude is most pronounced during the warm season.[103]

Atmospheric circulation plays an important role in shaping the climate. During the cold period of the year, a large part of the territory of the Kyrgyz Republic is influenced by the Siberian anticyclone. Predominantly clear, frosty weather with sharply pronounced temperature inversions is observed. Precipitation is associated with the passage of cold atmospheric fronts originating from the west, northwest, and north, as well as with intrusions of southern cyclones, which exert the greatest influence on southwestern Kyrgyzstan (Osh, Jalal-Abad, and Batken regions). During the warm period of the year, Kyrgyzstan lies outside the main atmospheric circulation systems, which results in the prevalence of a weak-gradient low-pressure field. In June–August, a thermal depression may form, which is subsequently replaced by western, northwestern, or northern intrusions. These intrusions occur as dry and relatively clear conditions in the valleys and are accompanied by thunderstorms and precipitation in the mountainous areas.[104]

The underlying surface also exerts a major influence on the formation of the climate. The mountainous nature of the terrain determines the vertical zonality of climatic belts. With ascent from the mountain foothills to the summits, the same succession of climatic zones is observed as with movement from subtropical to Arctic coastal regions. Vertical climatic zonality is complicated by the orographic structure: deeply dissected mountain ranges and intermountain basins exert a substantial influence on the formation of climatic conditions. Large altitude amplitudes create significant contrasts in temperature regimes and levels of humidity. Characteristic features of the mountain climate include decreases in atmospheric pressure and air temperature with altitude (on average by 0.6°C per 100 meters), reductions in diurnal and annual temperature fluctuations, and increases in precipitation up to a certain elevation. Particularly distinctive climatic conditions are formed in the Issyk-Kul Basin, the lower part of which is occupied by the non-freezing lake. Within this relatively small area, all types of climate are represented—from sharply continental to maritime. [105]

The atmospheric pressure ranges from 950 hPa in the valley areas (northern Chui Valley, 596 meters above sea level) to 650 hPa in the high-mountain zone (Kumtor area, 3,614 meters above sea level). On an annual scale, in the valley areas, the minimum pressure values are observed in July and the maximum in November; at elevations between 2,000 and 3,000 meters, the minimum values occur in March and the maximum in October–November; in the high-mountain areas (above 3,000 meters), the minimum values are recorded in February, while the maximum occurs between August and October.[106]

Relative air humidity, which characterizes the degree of air saturation with water vapor, varies from 80% in the valley areas to 50% in the near-ridge zones during the winter period, and from 35–40% in the valley zones of Osh, Jalal-Abad, and Batken regions to 70% in the pre-glacial zones during the summer. The annual amplitude of relative air humidity decreases from 35–40% in the valley areas to 6–10% in the pre-glacial zones. In the Issyk-Kul Basin, the annual amplitude does not exceed 10–12%.[107]

[103] Ministry of Emergency Situations (MES) of the Kyrgyz Republic. Monitoring and Forecasting of Hazardous Processes and Phenomena in the Territory of the Kyrgyz Republic (20th Edition, revised and supplemented). Bishkek, 2023
[104] Ibid.
[105] Ministry of Emergency Situations (MES) of the Kyrgyz Republic. Monitoring and Forecasting of Hazardous Processes and Phenomena in the Territory of the Kyrgyz Republic (20th Edition, revised and supplemented). Bishkek, 2023. – 848 p.
[106] Ibid.
[107] Ibid.

A pronounced vertical zonality is observed in the distribution of air temperature: the mean annual temperature varies from 10…13°C in the valley areas to 7…8°C in the high-mountain regions. It should be noted that a comparison of the mean annual air temperature values for two consecutive thirty-year periods, 1931–1960 and 1961–1990, demonstrated an increase of 0.6–0.7°C in the latter period. The influence of absolute altitude on temperature is particularly evident during the warm season. The highest mean monthly temperatures in summer are recorded in the low-lying northern part of the Chui Valley, as well as in the valley zones of Osh, Jalal-Abad, and Batken regions. July is the hottest month of the year. The mean July temperature ranges from 25…27°C in the Pre-Fergana area to 4°C in the Kumtor region (3,600 meters above sea level). [108]

In the cold season, the distribution of air temperature is more strongly influenced by the relief. At the same elevations, temperatures in enclosed valleys and intermountain basins are significantly lower than on the slopes of mountain ranges. The lowest mean monthly winter temperatures are recorded in the high-mountain glacial zones (Kumtor region, Ak-Sai Valley) and in the Suusamyr Basin. The mean January temperature in the Suusamyr Basin (2,600 meters above sea level) corresponds to that of the Kumtor area (3,610 meters above sea level), at –21.5…–21.9°C. The highest winter temperatures are observed in the foothills of the Fergana and Kyrgyz mountain ranges, at 2…4°C. The transition of the mean daily air temperature across the 0°C threshold in autumn and spring is considered the onset and the end of the meteorological winter. In the lower zones of Jalal-Abad and Osh regions, this period is the shortest, lasting from the second or third ten-day period of December until the second ten-day period of February. In the foothills of the southern regions, in the Chui and Talas Valleys, as well as in the Issyk-Kul Basin, the winter period lasts from the second or third ten-day period of November until the first or second ten-day period of March. [109]

In the agricultural areas of the Naryn region, the winter period begins in early November and continues until the end of March. In the high-mountain areas, this period is longer: in the Suusamyr Valley it extends from the second ten-day period of October until the second ten-day period of April; in the Ak-Sai and Arpa Valleys, from the first ten-day period of October until the third ten-day period of April; and in the Kumtor area, from mid-September until the end of May. The period with a mean daily air temperature of +15°C and higher is considered the warmest part of summer. Its duration is 150–175 days in the Osh, Jalal-Abad, and Batken regions; 140–145 days in the Chui Valley; 110–120 days in the Talas Valley; and 65–70 days in the Issyk-Kul Basin. With increasing altitude up to 2,000 meters (in the agricultural areas of the Naryn region), the summer period is reduced to 40–70 days, while above 2,500 meters it is absent altogether. [110]

In the agricultural areas, late spring and early autumn frosts pose a significant risk. In the cotton-growing zones of the Osh and Jalal-Abad regions, late spring frosts may occur until the second ten-day period of April in the foothill areas. In the Chui and Talas Valleys, such frosts may be observed until the third ten-day period of May; in the Issyk-Kul region, until the first ten-day period of June; and in the agricultural areas of the Naryn region, until the second ten-day period of June. In the Kochkor Basin, in certain years, frost-free periods may not occur at all, and frosts may be recorded in any summer month. In the eastern part of the Issyk-Kul area, early autumn frosts begin in late August; in the At-Bashi district of the Naryn region, in the first ten-day period of August; in the cotton-growing zones of the southern regions, in October; and in other agricultural areas of the Kyrgyz Republic, in September.[111]

[108] Ministry of Emergency Situations (MES) of the Kyrgyz Republic. Monitoring and Forecasting of Hazardous Processes and Phenomena in the Territory of the Kyrgyz Republic (20th Edition, revised and supplemented). Bishkek, 2023
[109] Ibid.
[110] Ministry of Emergency Situations (MES) of the Kyrgyz Republic. Monitoring and Forecasting of Hazardous Processes and Phenomena in the Territory of the Kyrgyz Republic (20th Edition, revised and supplemented). Bishkek, 2023. – 848 p.
[111] Ibid.

Against the general background of the arid Central Asian region, the mountainous areas of the Kyrgyz Republic are relatively well-moistened. As a result of the forced ascent of air masses along mountain slopes, and the associated orographic intensification of atmospheric fronts, all peripheral slopes, regardless of their exposure, receive substantial amounts of precipitation. The most abundant precipitation is observed on the western and southwestern slopes exposed to moisture-bearing airflows, reaching up to 1,100 mm per year on the southern slopes of the Chatkal Range and 1,500–2,000 mm in the near-ridge zones of the southwestern slopes of the Fergana Range and the northern slopes of the Kyrgyz Range. By contrast, all leeward mountain slopes and deeply incised valleys located within the interior of mountain systems, or shielded by high ranges intercepting the bulk of moisture, are characterized by very dry conditions. The western shoreline of Lake Issyk-Kul is the most arid area, where the annual amount of precipitation does not exceed 140–150 mm.[112]

In most areas of the Kyrgyz Republic, the majority of precipitation falls during the warm season. The exceptions are the Osh, Jalal-Abad, and Batken regions, where 50–60% of the annual precipitation occurs during the cold season. In the valley areas and on the windward mountain slopes, the primary precipitation maximum is observed in the spring months, with a secondary maximum in October–November, and a minimum in August–September. In the high-mountain areas and in the Issyk-Kul Basin, the maximum precipitation is recorded in June–July. In the Kyrgyz Republic, the intra-annual distribution of precipitation, which clearly reflects prevailing circulation patterns, served as the basis for climatic zoning. Four climatic regions have been identified across the country,[113] each characterized by relatively homogeneous conditions within the region and significant climatic differences between regions (Figure 2.6).

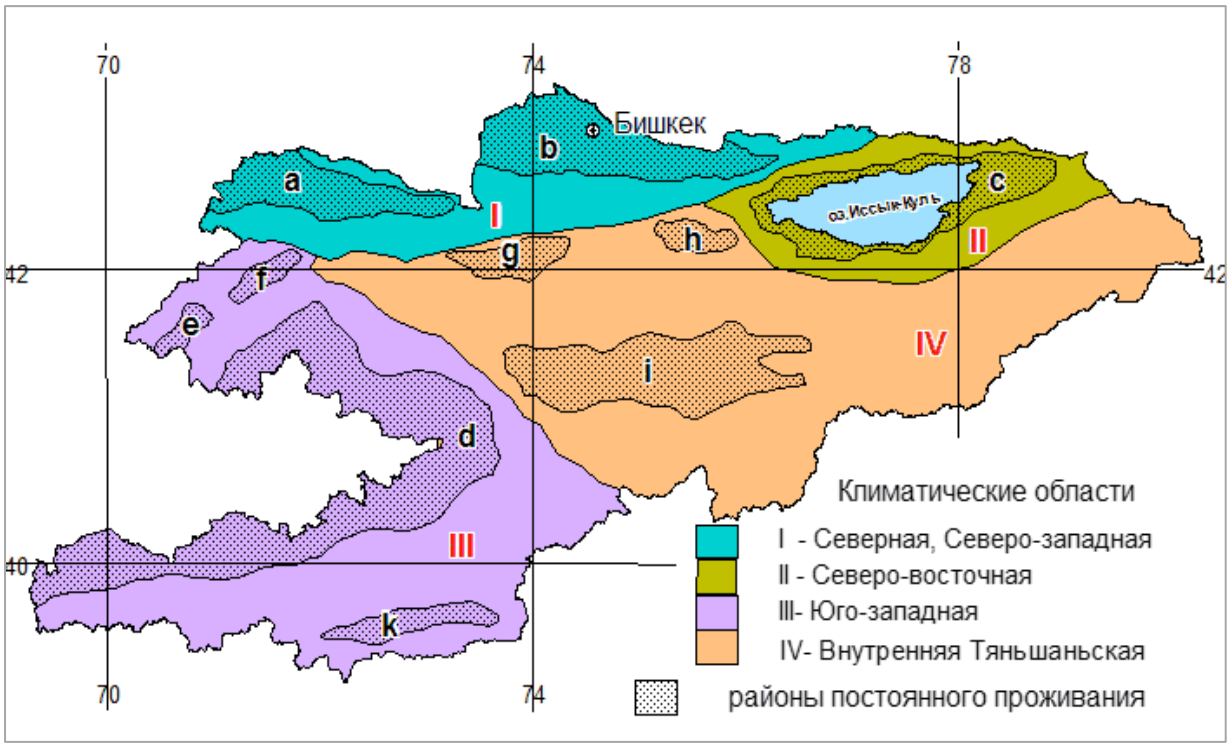



*Figure 2.6. Climatic Zones of the Kyrgyz Republic.*

I. Northern and Northwestern Kyrgyzstan. This climatic zone includes the Chui and Talas Valleys and the surrounding mountain ranges. It is characterized by a moderately warm and sufficiently humid climate, with a maximum of precipitation in spring and early summer, and a moderate amount of winter

[112] Ibid.
[113] Ibid.

precipitation, which is largely determined by the influence of the Siberian anticyclone. The second half of summer in the lowland areas is dry.

II. Southwestern Kyrgyzstan. This climatic zone encompasses the Fergana, Alai, and Chatkal Valleys and their surrounding mountain ranges. It is the warmest and most humid region, where, unlike other parts of the Kyrgyz Republic, a significant share of annual precipitation occurs during the cold season. In other respects, the annual precipitation cycle resembles that of Zone I: the maximum falls in spring in the lowland areas and shifts to early summer at higher elevations. The second half of summer is marked by low precipitation, with droughts occurring in the lowland areas during August and September. During the warm season, this climatic zone records the highest air temperatures in the country.

III. Northeastern Kyrgyzstan. This climatic zone includes the Issyk-Kul Basin. It is distinguished by a precipitation maximum in summer and a relatively low amount of precipitation in winter, since low winter clouds forming at altitudes below 3,000 meters are blocked by the surrounding mountain ranges and rarely penetrate into the Issyk-Kul Basin. The presence of Lake Issyk-Kul, which does not freeze in winter, gives the territory certain features of a maritime climate. The lake's water mass exerts a moderating effect on air temperature in winter, while in summer this influence is almost negligible.

IV. Inner Tien Shan is characterized by the coldest and relatively dry climate, the distinctive feature of which is low evaporation under low-temperature conditions. In the high-mountain zone, where precipitation exceeds evaporation, extensive areas are occupied by glaciers and permanent snowfields. The annual cycle of precipitation is similar to that of Climatic Zone III, with the maximum occurring in May, June, and July.[114]

Snow cover in the lower zones of Osh, Jalal-Abad, and Batken regions is established in late November–early December and persists until mid-March, with depths ranging from 5 to 25 cm. [115] On the slopes of the Fergana Range, snow cover may reach 40–60 cm in depth and remain from mid-November until mid-April. The Chatkal Valley is among the snowiest areas of the Kyrgyz Republic, where stable snow cover of 60–100 cm persists for 4–5 months.

## 2.1.6 Sectors' details

### *2.1.6.1 Energy*

The significant water resources of the Kyrgyz Republic make hydropower the most important source of energy. The country also has substantial coal deposits; however, reserves of oil and natural gas are limited. The Kyrgyz Republic remains dependent on imports of natural gas, crude oil, and petroleum products.[116]

Domestic energy production consists primarily of hydropower generation and coal extraction, supplemented by limited production of oil and natural gas.

In 2023, the total supply of fuel and energy resources (FER) in the Kyrgyz Republic amounted to 18,090 thousand tonnes of oil equivalent (toe), of which 69.1% was domestically produced/extracted, 24.3% was imported, and 6.6% represented stocks carried over from the beginning of the year. [117]

[114] Ministry of Emergency Situations (MES) of the Kyrgyz Republic. Monitoring and Forecasting of Hazardous Processes and Phenomena in the Territory of the Kyrgyz Republic (20th Edition, revised and supplemented). Bishkek, 2023. – 848 p.
[115] Ibid.
[116] International Energy Agency (IEA). 2022. Kyrgyzstan 2022. Energy Sector Review. https://iea.blob.core.windows.net/assets/9d0cb3be-48fd-424f-8968-e543a43e8614/Kyrgyzstan2022.pdf
[117] NSC. Fuel and Energy Balance for 2023. https://stat.gov.kg/ru/publications/toplivno-energeticheskij-balans/

Compared to 1990, the total FER supply in 2023 increased by 14.7%[118], relative to 2022, it grew by 1.6%; and compared to 2017, the base year of the Nationally Determined Contribution (NDC), it rose by 9.2%.[119]

At the same time, in 2023, domestic production/extraction increased by 129.6% compared to 1990, while imports declined by 52.7%. [120] Compared to 2017, domestic FER production decreased by 0.3%, while imports increased by 51%. Compared to 2022, domestic FER production rose by 2.7%, and imports grew by 7.9%.[121]

Total FER consumption in 2023 amounted to 14,069 thousand toe, or 77.8% of the total FER supply. Exports accounted for 9.6%, losses for 5.2%, and year-end stocks for 7.4%. Compared to 1990, total FER consumption in 2023 increased by 27.9%[122], relative to 2022, it grew by 2.2%; and compared to 2017, it rose by 4.9%.[123]

At the same time, in 2023, FER consumption increased by 129.6% compared to 1990, while exports declined by 54.5%. [124] Compared to 2017, FER consumption rose by 4.9%, and compared to 2022, by 2.2%. FER exports increased by 106% compared to 2017, and by 20% relative to 2022.[125]

According to the 2023 data of the National Statistical Committee energy balance, a continuous time series of statistical information on various types of FER is available for the period 2005–2023. Therefore, in the following sections, balances of different FER types produced in the Kyrgyz Republic during this period will be presented.

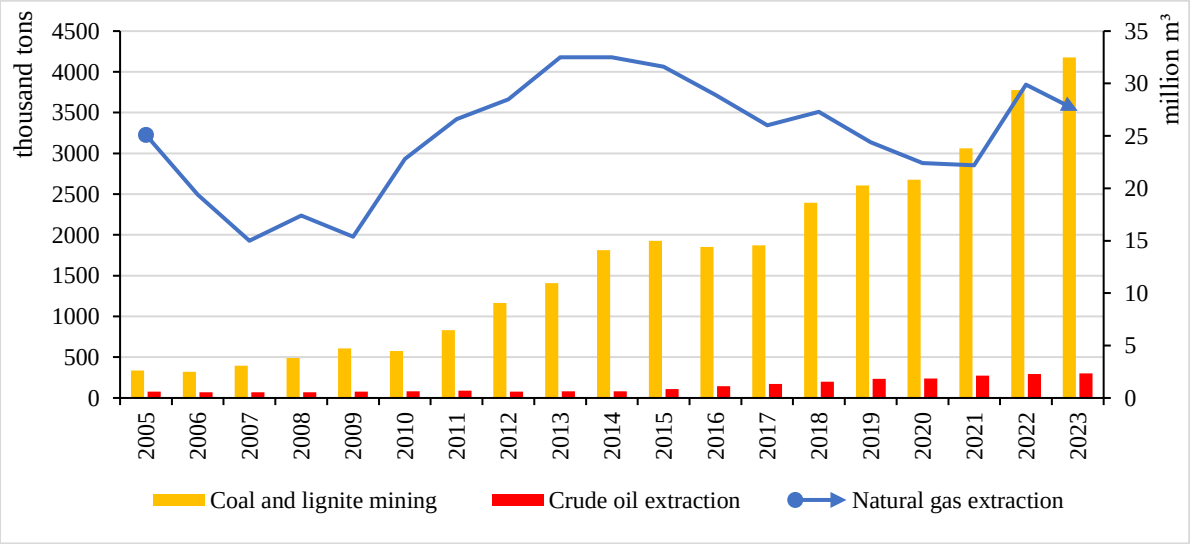



*Figure 2.7. Dynamics of Production of Main Types of Fuel for the Period 2005–2023*[126]

In 2023, coal stocks at the beginning of the year amounted to 1,085.6 thousand tonnes. Coal and lignite production totaled 4,177.4 thousand tonnes, which is almost 12 times higher than in 2005, 123.3% higher than in 2017, and 10.6% higher than in 2022. Coal imports reached 1,159.3 thousand tonnes,

[118] Simakov Yu.P. Use of Coal in the Kyrgyz Republic. Available at: https://unece.org/fileadmin/DAM/ie/capact/ppp/pdfs/simakov_kyrgyz.pdf
[119] NSC. Fuel and Energy Balance for 2023.
[120] Ibid.
[121] Ibid.
[122] Simakov Yu.P. Use of Coal in the Kyrgyz Republic. 2001. Available at: https://unece.org/fileadmin/DAM/ie/capact/ppp/pdfs/simakov_kyrgyz.pdf and NSC. Fuel and Energy Balance for 2023.
[123] NSC. Fuel and Energy Balance for 2023. https://stat.gov.kg/ru/publications/toplivno-energeticheskij-balans/
[124] NSC. Fuel and Energy Balance for 2023. https://stat.gov.kg/ru/publications/toplivno-energeticheskij-balans/
[125] Ibid.
[126] NSC.https://www.stat.gov.kg/ru/statistics/promyshlennost/

which is 19.1% higher than in 2005, 24.8% higher than in 2017, and 47.9% higher than in 2022. In total, the coal resource balance in 2023 amounted to 6,422.3 thousand tonnes.

In 2023, domestic coal consumption totaled 2,812.3 thousand tonnes, or 43.8% of the total resource balance, representing an increase of 123.8% compared to 2005, 31.7% compared to 2017, and 1.8% compared to 2022.

In the same year, 2,218.6 thousand tonnes of coal (34.5% of the total annual resource balance) were exported, which is 25 times higher than in 2005, 361.8% higher than in 2017, and 41.3% higher than in 2022[127]

Coal losses in 2023 accounted for 0.05% of the total resource balance, while year-end stocks amounted to 1,388.2 thousand tonnes, or 21.6% of the total coal resource balance. In total, the distribution of coal resources amounted to 6,422.3 thousand tonnes.[128]

The total oil resource balance in 2023 amounted to 311.9 thousand tonnes, of which 303.1 thousand tonnes (97.2%) were produced. This represents an increase of 289.1% compared to 2005, 75.0% compared to 2017, and 203.1% compared to 2022. In the same year, 7.8 thousand tonnes (2.5% of the total resource balance) of oil were imported, which is 52.9% higher than in 2005, 500.0% higher than in 2017, but 92.2% lower than in 2022. Approximately 1.0 thousand tonnes (0.3%) represented opening stocks at the beginning of the year.[129]

Total oil consumption in 2023 amounted to 310.1 thousand tonnes, or 99.4% of the total resource balance, which is 286.7% higher than in 2005, 111.8% higher than in 2017, and 210.1% higher than in 2022. Oil stocks at the end of the year amounted to 1.8 thousand tonnes (0.6% of the total).[130] The total distribution of oil resources was 311.9 thousand tonnes.

The total natural gas resource balance and distribution in 2023 amounted to 466.1 million m³. Gas production totaled 27.4 million m³, or 5.9% of the total resource balance, which is 9.2% higher than in 2005, 5.0% higher than in 2017, and 8.4% lower than in 2022.

Natural gas imports in 2023 amounted to 438.7 million m³, or 94.1% of the total resource balance, which is 38.3% lower than in 2005, but 57.6% higher than in 2017, and 5.6% higher than in 2022.

Natural gas consumption in 2023 totaled 438.4 million m³, or 94.1% of the total resource balance, while 5.9% of the resources were recorded as losses.

However, this remains significantly lower than the growing demand for energy carriers, which is compensated by imports (see Figure 2.8).

[127] NSC. Fuel and Energy Balance for 2023.https://stat.gov.kg/ru/publications/toplivno-energeticheskij-balans/
[128] NSC. Fuel and Energy Balance for 2023. https://stat.gov.kg/ru/publications/toplivno-energeticheskij-balans/
[129] NSC. Fuel and Energy Balance for 2023.https://stat.gov.kg/ru/publications/toplivno-energeticheskij-balans/
[130] Ibid.

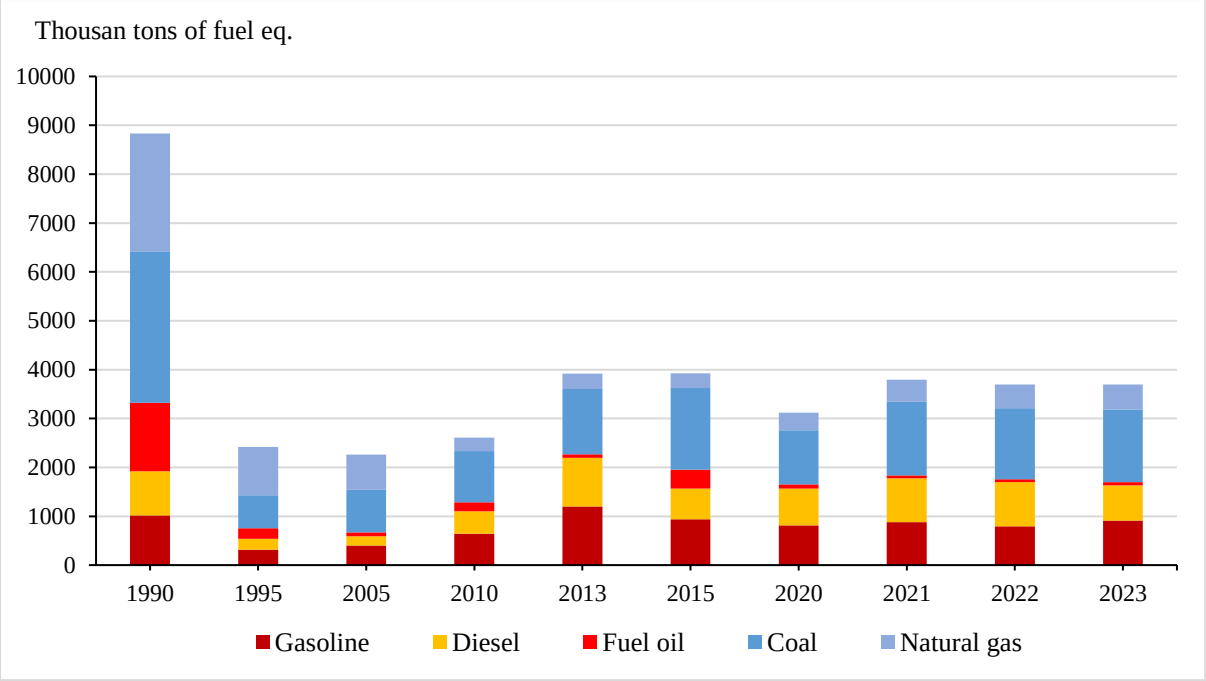



*Figure 2.8. Dynamics of Fossil Fuel Consumption*

Domestic energy production in the Kyrgyz Republic is primarily generated by hydropower plants, thermal power plants (TPPs), and coal extraction. The largest energy consumers in the country are the residential sector, thermal power plants, and transport, followed by industry. The population has universal access to electricity, and household tariffs for electricity remain among the lowest in the world.[131]

At the same time, as an energy-deficient country, the Kyrgyz Republic has imported between 50–100 petajoules (PJ) of energy annually over the past two decades. The energy sector accounts for approximately 4% of gross domestic product and is highly dependent on hydropower resources.[132]

In addition, the Kyrgyz Republic imports petroleum products and natural gas, mainly from the Russia and Kazakhstan. Historically, the energy and water supply systems of the region were closely linked to the operation of large hydropower plants and the regulation of reservoir levels, which had direct impacts on neighboring countries such as Uzbekistan, Tajikistan, and Kazakhstan. Coordination among these countries became more complex after independence in the early 1990s. Today, aging infrastructure and climate change further exacerbate energy security challenges, as shifts in river runoff patterns directly affect the energy sector of the Kyrgyz Republic.

The alternation of low-water and high-water years, with associated fluctuations in hydropower generation, results in uneven electricity production in the Kyrgyz Republic and recurrent energy crises.[133]

In July 2023, the President of the Kyrgyz Republic declared a state of emergency, effective from 1 August 2023 to 31 December 2026. This decision was taken in response to the urgent need to address the energy crisis in the country, which has been triggered by climate-related challenges, insufficient water inflows in the Naryn River basin, and a deficit of generating capacities amid rapidly growing electricity consumption.[134]

[131] Ibid.
[132] Eclareon GmbH. 2023. Introduction of Photovoltaic Systems in Kyrgyzstan
[133] Ibid.
[134] Decree of the President of the Kyrgyz Republic No. 178 of 24 July 2023 “On the Introduction of a State of Emergency in the Energy Sector of the Kyrgyz Republic.” http://cbd.minjust.gov.kg/act/view/ru-ru/435085]

The situation regarding fuel and energy consumption in 2023 is illustrated in Figure 2.9.

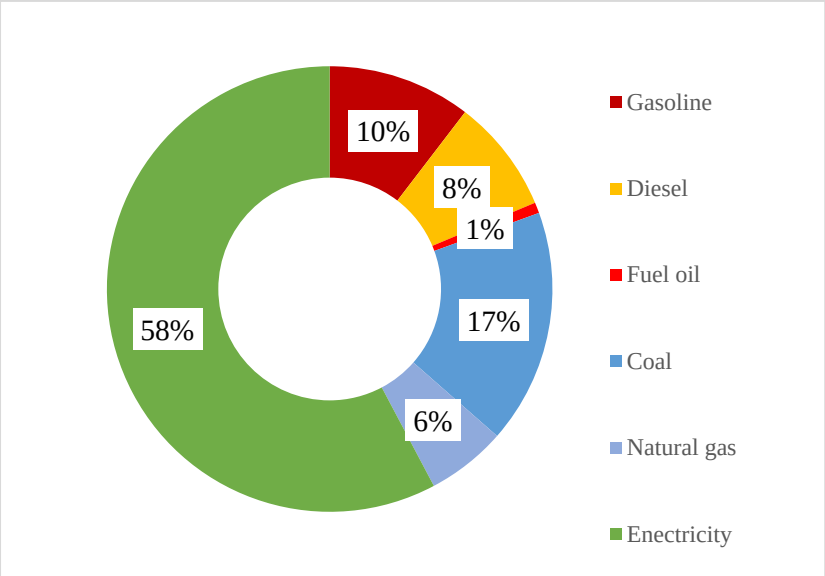



*Figure 2.9. Consumption of Fuel and Energy Resources in 2023*[135]

In the Kyrgyz Republic, electricity is generated primarily by hydropower plants, followed by thermal power plants, which operate mainly on coal. In 2023, the country produced approximately 13.8 TWh of electricity, of which 87% was generated from hydropower.[136]

The dynamics of electricity consumption by sector for the period 2011–2023 are presented in Figure 2.10.

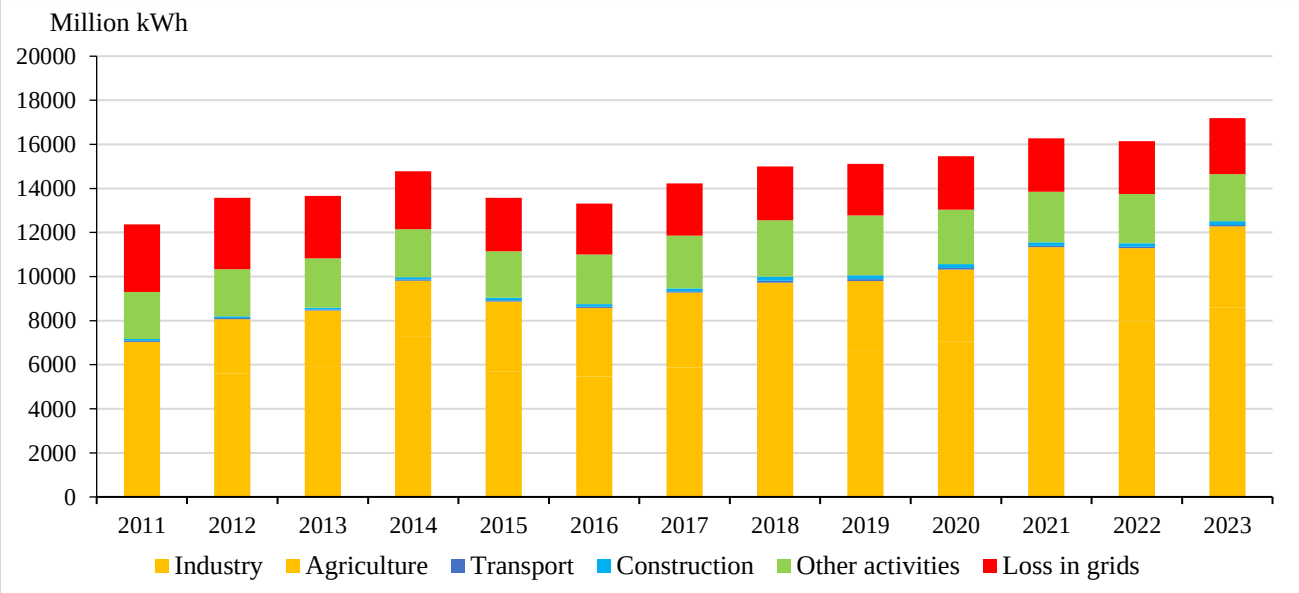



*Figure 2.10. Electricity Consumption by Sector, 2011–2023.*

During the period 2011–2023, the highest growth in electricity consumption was observed in the construction sector (167%), the manufacturing industry (76%), and agriculture (72%). At the same time,

[135] NSC. https://www.stat.gov.kg/ru/statistics/promyshlennost/
[136] NSC. https://www.stat.gov.kg/ru/statistics/promyshlennost/

electricity consumption declined in the transport sector (–6%). Electricity exports also decreased significantly (–95%), as did transmission losses (–17%).[137]

The shares of electricity consumption by sectors in 2023 are illustrated in Figure 2.11.

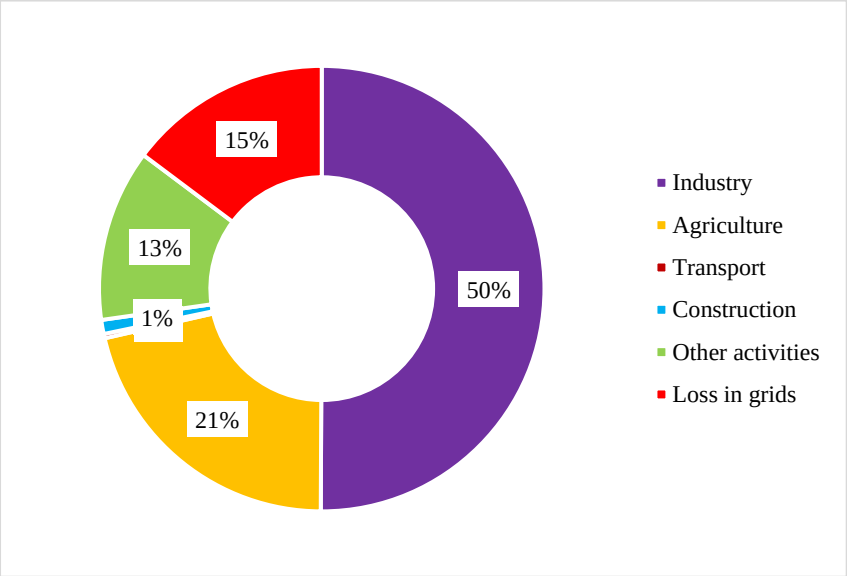



*Figure 2.11. Sectoral Shares in Electricity Consumption in 2023.*

In the Kyrgyz Republic, seven of the nine largest power plants are hydropower plants, with the exception of two major thermal power plants located in Bishkek and Osh, which are also vital for centralized heat supply in these cities (Table 2.7). The total installed capacity of these power plants is 3,892 MW.[138]

*Table 2.7. Major Power Plants of the Kyrgyz Republic[139]*

| Power Plant | Year of Commissioning | Capacity (MW) | Energy Source |
|---|---|---|---|
| Uch-Kurgan | 1961 | 180 | Hydropower |
| At-Bashi | 1970 | 40 | Hydropower |
| Toktogul | 1975 | 1,200 | Hydropower |
| Kurpsai | 1982 | 800 | Hydropower |
| Tash-Kumyr | 1987 | 450 | Hydropower |
| Shamaldysai | 1992 | 240 | Hydropower |
| Kambarata-2 | 2010 | 120 | Hydropower |
| Bishkek TPP | 1961 | 812 | Thermal |
| Osh TPP | 1966 | 50 | Thermal |

Alongside the large HPPs, the Kyrgyz Republic also has approximately a dozen small hydropower plants, with a total installed capacity of 63.38 MW, as presented in Table 2.8.

[137] NSC. https://www.stat.gov.kg/ru/statistics/promyshlennost/

[138] Ministry of Energy, Asian Development Bank (ADB). 2022. Master Plan for the Comprehensive Development of the Energy Sector of the Kyrgyz Republic.https://minenergo.gov.kg/media/uploads/2022/12/07/mp-kr-finalreport-rev5_v2_en_website_hQEeGIO.pdf

[139] Ministry of Energy, Asian Development Bank (ADB). 2022. Master Plan for the Comprehensive Development of the Energy Sector of the Kyrgyz Republic https://minenergo.gov.kg/media/uploads/2022/12/07/mp-kr-finalreport-rev5_v2_en_website_hQEeGIO.pdf

*Table 2.8. Small Hydropower Plants Operating in the Kyrgyz Republic*[140]

| Power Plant | Capacity (MW) |
|---|---|
| OJSC Chakan – Cascade of SHPPs (including Lebedinovskaya HPP, Alamedin Cascade HPPs, and Bystrovskaya HPP) | 38.4 |
| LLC Kalinin HPP | 1.4 |
| LLC Issyk-Atinskaya HPP | 1.6 |
| CJSC Naiman HPP | 0.6 |
| LLC ARK Construction Company | 1.4 |
| SHPP Maryam agricultural cooperative | 0.5 |
| Sokuluk HPP-2 | 2.4 |
| LLC Tegirmentinskaya HPPs, HPP No. 2 | 3 |
| LLC Konur-Olon HPP | 3.6 |
| Ton HPP | 3.6 |
| LLC Kok-Sai HPP | 3.4 |
| SHPP Jidalik of OJSC Kadamdzhai Antimony Plant | 1 |
| Kyrgyz-Atinskaya SHPP | 0.4 |
| Jiptik HPP | 2 |
| Ak-Bura (Ozgur) HPP | 0.23 |
| Buiga HPP | 0.4 |
| Oktalio HPP | 0.85 |
| *Total* | 63.38 |

According to the Ministry of Energy, approximately 31 additional small hydropower plants are expected to be commissioned by 2027.

All of these hydropower capacities continue to play a vital role in ensuring the energy security of the Kyrgyz Republic. At the same time, the existing assets are generally worn out due to long service life and poor maintenance, and several rehabilitation projects are currently being implemented to restore and expand generation capacity.

Key issues affecting the power generation sector:

- The majority of assets are more than 30 years old, have either failed or exceeded their economic and technical lifespans, and require urgent rehabilitation or replacement.
- Since electricity tariffs are subsidized and remain below production costs, energy companies lack sufficient funds for proper maintenance of existing assets and for the rehabilitation/replacement of depreciated infrastructure.
- Aging and inadequate maintenance significantly reduce the generation capacity and efficiency of assets, leading to low reliability of electricity supply.
- The poor condition of transmission and distribution assets results in high technical losses, while inadequate accounting and billing practices contribute to high commercial losses.
- Heavy reliance on hydropower makes the Kyrgyz power generation system highly dependent on water availability, which fluctuates from year to year and may decline in the future due to climate change.
- There is a mismatch between the seasonality of electricity demand, which is higher in winter due to heating needs, and the seasonality of water inflows to hydropower plants and, in

[140] Ministry of Energy, Asian Development Bank (ADB). 2022. Master Plan for the Comprehensive Development of the Energy Sector of the Kyrgyz Republic. https://minenergo.gov.kg/media/uploads/2022/12/07/mp-kr-finalreport-rev5_v2_en_website_hQEeGIO.pdf

particular, the release of water from the Toktogul Reservoir for agricultural irrigation, which is higher in summer.[141]

With regard to the heating sector, given the cold climate of the country, the availability and reliability of both space heating and hot water supply have a significant impact on the well-being of the population and the quality of public utility services.

Overall, heat production and distribution assets are in poor condition due to aging and insufficient funding for maintenance, which results in low service quality. In recent years, this situation has led to increased winter use of electricity for heating, thereby placing a heavy burden on both power plants and the transmission network, and making it highly challenging to balance winter electricity demand with domestic generation.

The population of the Kyrgyz Republic relies on various systems for space heating and hot water supply:

- Individual stoves/boilers;
- Small- and medium-scale district boiler houses supplying a limited number of buildings;
- Large district heating systems (DHS).

District heating systems cover only 19% of the total number of households. DHS are available in urban areas of the following regions: Chui (including Bishkek and Tokmok), Osh, Jalal-Abad, Talas, Naryn, and Issyk-Kul.

Challenges in the Heating Sector:

- Tariffs for residential heating and hot water supply remain below cost-recovery levels.
- Most district heating system infrastructure was commissioned between 20 and 50 years ago.
- Low reliability of DHS heat supply has necessitated the use of supplementary heating technologies, in particular electric radiators, which require very low capital investments.
- Overall, only a limited number of end-users connected to district heating systems have individual heating and water meters.
- Moreover, these customers are unable to regulate their consumption due to the absence of thermostatic valves at the apartment level. As a result, the majority of billing is based on normative standards rather than actual consumption.
- The Bishkek heat distribution company sets the maximum operating temperature at 80/90°C, which reduces the maximum volume of heat supplied, leaving part of the demand unmet and significantly lowering the maximum heat delivery compared to the actual capacity of the rehabilitated Bishkek TPP.
- Many boilers supplying DHS, which were originally designed to operate on natural gas, are now operated on coal or fuel oil, with reduced capacity and efficiency. In addition, many of these assets are outdated and poorly maintained.
- Individual stoves operating on solid fuels, which serve as the main source of heating for households not connected to DHS networks, are characterized by very low thermal efficiency, resulting in high fuel consumption as well as high levels of both indoor and outdoor air pollution.
- The majority of buildings constructed before 1990 are poorly insulated and maintained, with high heat losses and low comfort levels.[142]

[141] Ministry of Energy, Asian Development Bank (ADB). 2022. Master Plan for the Comprehensive Development of the Energy Sector of the Kyrgyz Republic.https://minenergo.gov.kg/media/uploads/2022/12/07/mp-kr-finalreport-rev5_v2_en_website_hQEeGIO.pdf

[142] Ministry of Energy, Asian Development Bank (ADB). 2022. Master Plan for the Comprehensive Development of the Energy Sector of the Kyrgyz Republic. https://minenergo.gov.kg/media/uploads/2022/12/07/mp-kr-finalreport-rev5_v2_en_website_hQEeGIO.pdf

The transmission network of the Kyrgyz Republic's national power grid consists mainly of three distinct high-voltage levels, namely 500 kV, 220 kV, and 110 kV. With respect to power transformers, some of them are outdated and approaching the end of their service life.

As a general observation, most of the components listed in these tables have been in operation for more than 25 years, which may adversely affect the reliability of the network and the quality of electricity supply if appropriate maintenance programmes are not implemented. Data from the regional centers of the national electricity grid indicate that consumers did not receive more than 428 MWh of electricity in 2020 due to 74 outages.[143]

Despite some reduction in recent years, electricity losses in the Kyrgyz energy system—particularly in the distribution network—remain higher than in neighboring countries.

Losses in electricity supply to end-users refer to the volume of electricity fed into transmission and distribution networks but not paid for by consumers. Losses are classified as technical and non-technical.

Technical losses occur naturally due to dissipation in power system components such as transmission and distribution lines, transformers, and metering systems. Non-technical losses**,** caused by factors external to the power system, consist mainly of electricity theft and non-payment of electricity bills by consumers. Errors in metering and accounting may also contribute to non-technical losses.

Losses in the transmission network are generally lower than those in the distribution network and remain under the full control of the transmission system operator. In contrast, distribution losses are more critical, because:

- Distribution networks are particularly widespread across the country and comprise thousands of feeders and cables, the condition of which is not always well known;
- Several operators are involved, and management practices of distribution networks may differ;
- The connection of thousands of loads often becomes a source of both technical and non-technical losses.

#### *2.1.6.1.1 Renewable Energy*

The potential for deploying photovoltaic (PV) systems in the Kyrgyz Republic is significant due to favorable solar radiation conditions. At present, there are no large-scale ground-mounted solar PV installations. Based on solar resource data, rooftop photovoltaic systems represent a practical option in a country such as the Kyrgyz Republic, where a large share of the housing stock consists of individual houses. Virtually any rooftop can accommodate several PV modules, and various reports indicate that many rooftops of Kyrgyz households are well-suited for PV installation. Trees and nearby buildings are generally not tall enough to create substantial shading risks. Even in multi-storey apartment buildings in Bishkek and other cities, there is potential for rooftop PV deployment.

The current strategy, however, appears to be largely based on the assumption that, apart from hydropower, renewable energy sources (RES) such as solar and wind may play only a minor role in the Kyrgyz energy system. Nevertheless, the levelized cost of electricity (LCOE) for large-scale PV installations is already lower than the cost of fossil-fuel-based electricity generation in most countries,

[143]Ministry of Energy, Asian Development Bank (ADB). 2022. Master Plan for the Comprehensive Development of the Energy Sector of the Kyrgyz Republic. https://minenergo.gov.kg/media/uploads/2022/12/07/mp-kr-finalreport-rev5_v2_en_website_hQEeGIO.pdf

which demonstrates that PV systems are poised to become a cornerstone in building a more sustainable energy system.[144]

#### *2.1.6.1.2 Legal Framework for the Energy Sector*

The legislation of the Kyrgyz Republic in the field of the fuel and energy complex is based on the following fundamental laws, which have been amended and supplemented in the context of the country's development:

- Law "On Energy" (30 October 1996, No. 56);
- Law "On Electric Power Industry" (28 January 1997, No. 8);
- Law "On Energy Conservation" (7 July 1998, No. 88);
- Law "On Renewable Energy Sources" (31 December 2008, No. 283);
- Law "On Energy Efficiency of Buildings" (26 July, 2011).

The Law of the Kyrgyz Republic "On Energy," adopted on 30 October 1996, establishes the principles of organization and regulation of economic activities in the fuel and energy sector. The provisions of this Law apply to all enterprises of the fuel and energy complex, regardless of their form of ownership. The objectives of the Law are to enhance the economic efficiency and reliability of the fuel and energy sector, as well as to protect the interests of both consumers and producers.

The Law of the Kyrgyz Republic "On Electric Power Industry," adopted on 28 January 1997, is based on the provisions of the Law "On Energy" and applies to all legal entities, regardless of ownership, as well as to individuals engaged in the generation, transmission, distribution, sale, and consumption of electricity and heat.

The Law requires the inclusion of energy-saving costs in the production cost of electricity and heat. It also defines the rights and obligations of consumers and establishes the contractual frameworks governing their relationships with suppliers. An important feature of the Law was the introduction of not only administrative but also criminal liability for electricity and heat theft and other forms of illegal energy use. However, this provision has not yet been widely applied in practice.

The Law "On Energy Conservation" was adopted in 1998 with the aim of improving the efficiency of energy use in production, transmission, and consumption. However, as this legal act had an indirect rather than a direct character, it did not have a significant impact on the advancement of energy efficiency policy in the country. Moreover, implementing regulations and instructions were not developed, and neither clear allocation of responsibility nor an incentive system for enforcement was established.

Therefore, on 24 December 2008, amendments were introduced to the Law "On Energy Conservation." The new version of the Law defines procedures for the development and state oversight of energy efficiency policy, identifies sources of financing, and provides for the creation and use of various programs for recording energy production and consumption, energy audits, and the organization of state statistics in the field of energy efficiency.

The Law further provides for energy expertise, including assessments of energy efficiency, evaluations of the effective use of energy resources, the organization of accounting and control of energy resources, and the safety of energy equipment. The purpose of such expert activities is to determine the efficiency of energy resource use in the economic activities of enterprises and their compliance with established norms of energy resource utilization.

[144]Ministry of Energy, Asian Development Bank (ADB). 2022. Master Plan for the Comprehensive Development of the Energy Sector of the Kyrgyz Republic. https://minenergo.gov.kg/media/uploads/2022/12/07/mp-kr-finalreport-rev5_v2_en_website_hQEeGIO.pdf

At present, no single government body is explicitly responsible for the implementation of energy efficiency policy. Current energy-saving measures at energy enterprises are regulated through internal directives, under which each enterprise develops an annual plan of activities for saving fuel and energy resources and reports monthly on its implementation.

The Law "On Renewable Energy Sources" was signed by the President of the Kyrgyz Republic on 13 January 2009. The current version of the Law (as amended by the Laws of the Kyrgyz Republic of 9 August 2023, No. 174, and 13 September 2024, No. 164) establishes the legal, organizational, economic, and financial foundations, as well as the mechanisms for regulating relations between the state, producers, suppliers, and consumers of renewable energy sources (RES), equipment for their production, and installations for their utilization. The objective of the Law is to promote the development and use of RES, to improve the structure of the energy sector, to diversify energy resources, to enhance the social well-being of the population, and to ensure energy security, environmental protection, and the sustainable development of the national economy. It should be noted that the Law contains key provisions essential for the promotion of RES, including exemption from customs duties for RES equipment and installations, as well as the establishment of preferential operational periods for RES projects: 15 years for hydropower projects, and 25 years for projects utilizing solar, wind, biomass, and geothermal energy. However, for the effective implementation of the Law, the development of secondary legislation and the establishment of practical mechanisms were necessary, including methodologies for calculating tariffs for different producers of "green" electricity, taking into account profitability and environmental benefits.

The Law provides for the establishment of a preferential period through the application of tariff surcharges for electricity generated from renewable energy sources (RES) and small hydropower plants (SHPPs). Such surcharges are applied by multiplying the maximum level of existing electricity tariffs by a coefficient approved for each type of renewable energy source, as follows:

- For installations using hydropower: coefficient of 1.3;
- For installations using solar energy: coefficient of 1.3;
- For installations using biomass: coefficient of 1.3;
- For installations using wind energy: coefficient of 1.3;
- For installations using geothermal energy: coefficient of 1.3.

The Law of the Kyrgyz Republic "On Energy Efficiency of Buildings," adopted on 26 July 2011, establishes the legal framework for assessing energy efficiency and reducing energy consumption in buildings, as well as for energy-efficient construction. It regulates legal and organizational relations among building owners, regardless of ownership, certified experts, and executive authorities.

The scope of the Law extends to both new and existing buildings during their design, commissioning, after energy renovation, and when leased or sold, through the introduction of mandatory energy certification and labeling of buildings. The Law also regulates activities related to the efficient use of energy resources in buildings, including the operation of boiler houses, heating systems, and hot water supply systems.

#### *2.1.6.1.3 Provisions of National Policy for the Energy Sector*

Among the main strategic national development documents, the following can be highlighted:

In 2018, the Government of the Kyrgyz Republic adopted the long-term National Development Strategy for 2018–2040 (NDS).[145] Among other priorities, the Strategy sets a number of important objectives for the energy sector, which clearly demonstrate the priority directions of development:

[145] Approved by Presidential Decree of the Kyrgyz Republic No. 221 of 31 October 2018.

- Expansion of electricity generation capacity, including through hydropower facilities.
- Financial recovery of the energy sector, which underscores the need to revise energy tariffs, as well as to implement strict measures to reduce technical losses, with a target of reducing such losses by 11.6% by 2023.
- Renewal and modernization of transmission and distribution equipment and electricity networks, including hot water supply systems, identified as one of the sector's key Objectives. For this purpose, conditions will be created to ensure annual renewal of equipment and networks of no less than 1.5%, taking into account asset depreciation.
- Modernization and introduction of energy-efficient technologies, to be implemented through large-scale programs on energy efficiency and energy conservation. As an initial step, comprehensive technological renewal measures will be taken in all municipal enterprises responsible for maintaining basic infrastructure—lighting, waste management, water supply, and sanitation. These reforms will begin in the two main cities of the country, Bishkek and Osh.
- Expansion of the contribution of renewable energy sources (RES), whereby local energy supply systems based on solar, wind, hydropower, and geothermal energy will contribute to greater energy independence. The implementation of planned projects is expected to increase the capacity of the Kyrgyz energy system by at least 10% over the next five years, or by 385 MW.
- Implementation of the "Gasification of the Country" program, under which at least 60 settlements, covering more than 90,000 households, including 20 suburbs of the capital city Bishkek, will be supplied with natural gas by 2023.

In 2021, the National Development Program until 2026[146] was adopted to implement the provisions of the first phase of the National Development Strategy. Among its main provisions related to the energy sector, the following can be highlighted:

- Construction of large hydropower facilities, including Kambarata HPP-1, the Upper Naryn Cascade of HPPs, the Suusamyr Cascade of HPPs, the Kazarman Cascade of HPPs, and others;
- Construction of small hydropower plants (SHPPs);
- Implementation of the CASA-1000 project, aimed at expanding the cross-border power grid for electricity exports;
- Implementation of the energy efficiency improvement project for buildings;
- Development of alternative energy sources, particularly solar and wind energy;
- Modernization of street lighting with the goal of transitioning to energy-saving technologies and automation of street lighting management.

In June 2024, the Jogorku Kenesh (Parliament) of the Kyrgyz Republic reviewed and approved the National Energy Program (NEP) of the Kyrgyz Republic for the period until 2035. The Program defined the main directions for the development of the energy sector. It covers all aspects of energy production, transmission, and distribution; participation in regional electricity markets; fuel extraction; imports in case of shortages; and exports in case of surpluses. The Program also reflects trends in the introduction of innovative technologies and the full digitalization of the energy system, adaptation to climate change and compliance with international commitments, energy efficiency and conservation, economically sound tariff policy, and the implementation of anti-corruption and anti-crisis measures in management and control.

**Priority areas include:**

[146]Approved by Presidential Decree of the Kyrgyz Republic No. 435 of 12 October 2021.

- Sustainable development of the fuel and energy complex and renewable energy sources (RES);
- Demand-side management in the real sector and among the population;
- International cooperation and strengthening of external energy policy;
- Energy efficiency, energy conservation, environmental protection, and climate change adaptation;
- Financial recovery of the energy sector and economically sound tariff policy;
- Improvement of institutional reforms, support for innovative development, and capacity building.

The main expected results of the Program include:

- In the electricity sector: rehabilitation and modernization of several hydropower plants, commissioning of new generating units, commissioning of small hydropower plants, and the construction of Kambarata HPP-1;
- Construction of solar and wind power plants (SPPs and WPPs): solar power plants with a total capacity of 3,650 MW and an annual output of 6.6 billion kWh, and two wind power plants with a total capacity of 400 MW and an annual output of 560 million kWh;
- Expansion of power grids, with expectations of increased distributed capacities associated with the start of electricity exports to Afghanistan and Pakistan;
- Development of district heating systems in settlements;
- Deployment of new power plants, including those based on renewable energy sources, as well as new HPPs, SPPs, and WPPs.

The Program further states that ensuring accelerated growth in the production of electricity, heat, coal, oil, and natural gas will enable the country to overcome the energy crisis by 2026 and bring the energy sector out of the state of emergency. Additional measures will be developed to consolidate progress and strengthen the energy sector in order to achieve the Program's objectives by 2035.

The above review has demonstrated that the Kyrgyz Republic is sufficiently equipped with a legislative and regulatory framework for the successful development of the fuel and energy complex. However, the implementation of the adopted laws, strategies, programs, and other state documents remains inadequate and leaves much to be desired. In addition, some laws and programs require further refinement, which the Government of the Republic is gradually attempting to address.

#### *2.1.6.1.4 Institutional Arrangements and Governance of the Energy Sector*

The Ministry of Energy of the Kyrgyz Republic serves as the state regulator for the development of the energy sector, defining policies and development programs for the industry.

In addition to the Ministry, there are several other important stakeholders in the energy sector, including:

- Open Joint Stock Company (OJSC) Electric Power Plants;
- OJSC Bishkekteploset;
- OJSC Chakan HPPs (9 small hydropower plants);
- OJSC National Electric Grids of Kyrgyzstan and its Training Center;
- OJSC Kyrgyz Energy Settlement Center;
- Kyrgyz Technical University named after Razzakov.

#### *2.1.6.1.5 Transport*

The Kyrgyz Republic is a landlocked country in Central Asia, sharing 4,500 km of borders with China, Kazakhstan, Tajikistan, and Uzbekistan, and covering a land area of 199.9 thousand km². The country

is situated in the western and central parts of the Tien Shan Mountains, which shape its internal and external connectivity in the following ways:

- Northern Kyrgyzstan, comprising the Talas and Chui Valleys, largely corresponds to Talas and Chui regions. This area has good accessibility through six road and one railway cross-border connections with Kazakhstan.
- Southern Kyrgyzstan, characterized by high mountain ranges, lower hilly foothills, and the flat margins of the Fergana Valley, was historically connected to Uzbekistan and Tajikistan by multiple roads and two railway links during the Soviet period. The delimitation of borders and their closure in many places forced Kyrgyzstan to construct internal roads. The south of the country is connected to the north via the Bishkek–Osh highway. The southern regions are also linked to Tajikistan and China.
- Inner Tien Shan, the high-mountain part of the country, combines high ranges with large mountain basins and wide valleys. It has one road connecting to Kazakhstan through Issyk-Kul region, and two major routes: Bishkek–Osh and Bishkek–Naryn–Torugart, connecting the north and south of the country and linking Kyrgyzstan with China, respectively. The construction of a new alternative North–South highway is currently underway.

Although the Kyrgyz Republic positions itself as a potential transit hub for goods and passengers between Chinese and Western markets, substantial infrastructure improvements are required. The poor quality of infrastructure and the mountainous geography of the country hinder trade flows and limit access to international markets. The railway network of the Kyrgyz Republic is underdeveloped, and as a result, road transport accounts for the majority of passenger and freight transportation.[147]

The road network is one of the Kyrgyz Republic's largest assets, the value of which can be measured both in terms of the costs of its construction and rehabilitation, as well as the socio-economic benefits it provides. The quality of life of the population and the level of entrepreneurship are directly dependent on transport, the quality and durability of roads, and their further development. In the Kyrgyz Republic, 96% of freight and 98% of passenger transport is carried out by road. Thus, road transport constitutes the backbone of the country's transport system. Its resilience and efficiency are prerequisites for economic growth, stable trade flows, and the local development of high-mountain and remote regions of the country.

The dynamics of passenger and freight turnover in the Kyrgyz Republic for the period 2006–2023 are presented in Figure 2.12.

[147] UN ESCAP. 2019. Report on the Study of the Resilience of Road and Railway Infrastructure in the Kyrgyz Republic.

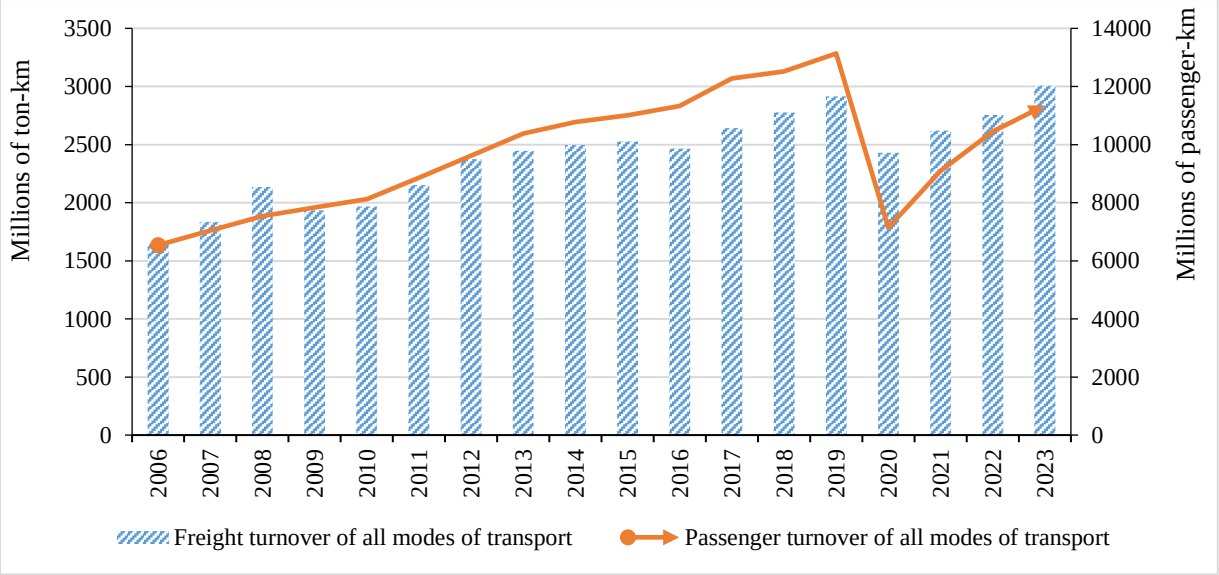



*Figure 2.12. Dynamics of Passenger and Freight Turnover by All Modes of Transport, 2010–2023*

According to the National Statistical Committee (NSC), freight turnover by all modes of transport has been increasing, and in 2023 it amounted to 11,350.7 million passenger-kilometers and 3,004.3 million tonne-kilometers. The impact of COVID-19 in the Kyrgyz Republic resulted in a decline of 46% in passenger transport and 17% in freight transport.

Transport statistics also provide information on the performance of the sector in terms of transport services by mode of transport. The majority of passenger transportation in the Kyrgyz Republic is carried out by buses (see Figure 2.13).

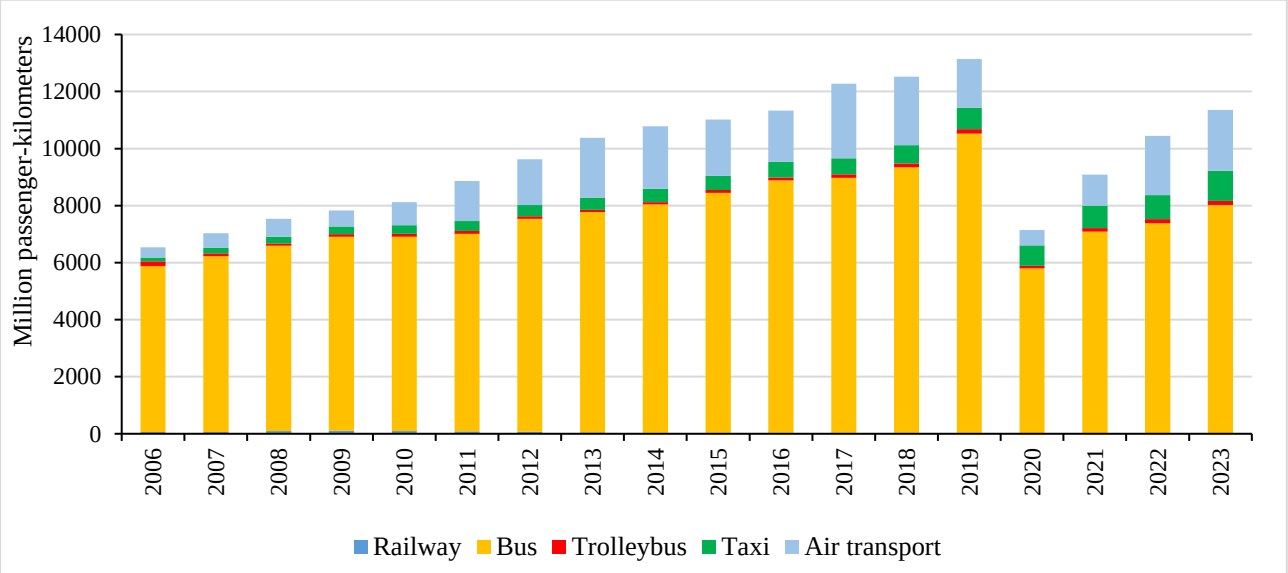



*Figure 2.13.. Dynamics of Passenger Transport by Type of Transport.*

In both passenger and freight transport, road (mainly heavy-duty) and rail transport predominate. Thus, in 2024, approximately 44.3 million tonnes were transported by road, 9.2 million tonnes by rail, 442.8 thousand tonnes by pipeline, and 44.8 thousand tonnes by air (see Figure 2.14).[148]

[148] NSC: https://stat.gov.kg/ru/statistics/transport-i-svyaz/

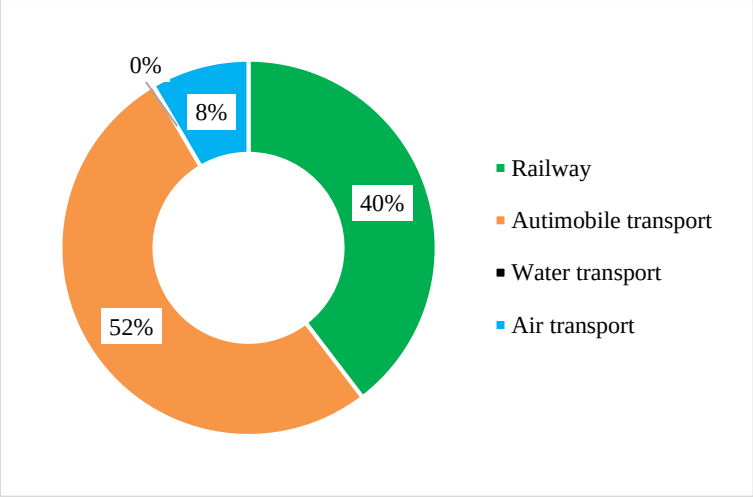



*Figure 2.14.Shares of Types of Transport in Freight Delivery in 2023*

In terms of revenues from passenger transport, the most profitable modes of transport are passenger cars, air transport, and buses (see Figure 2.15).

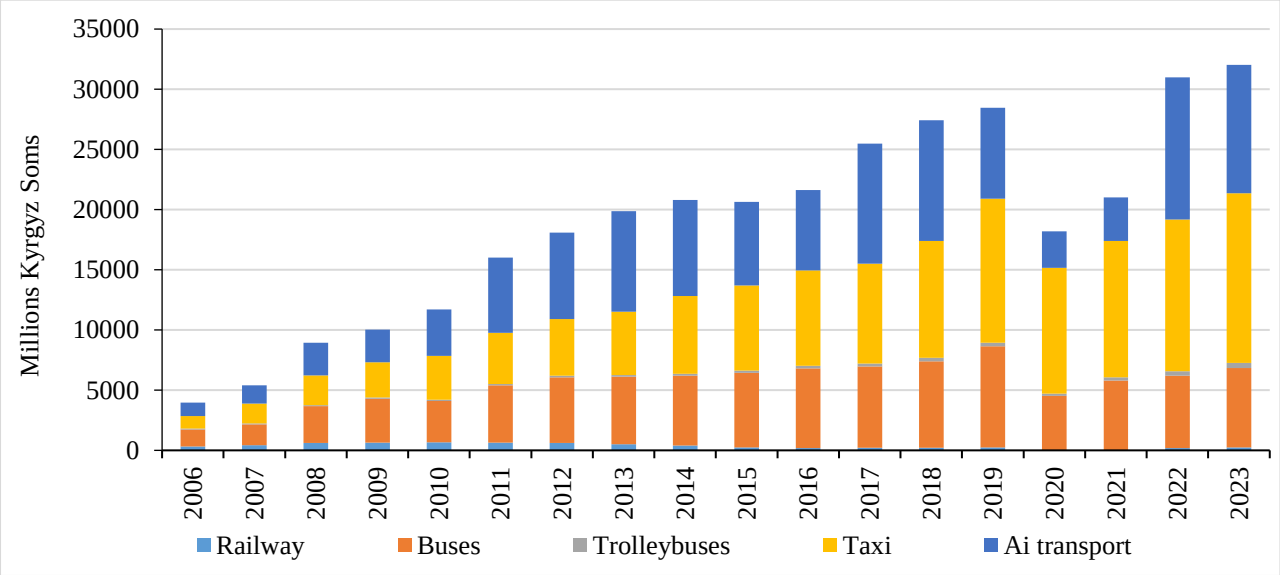



*Figure 2.15. Revenues from Passenger Transport by Type of Transport, 2011–2023*

For freight transport, revenues are distributed among road freight transport, rail, and air transport (Figure 2.16).

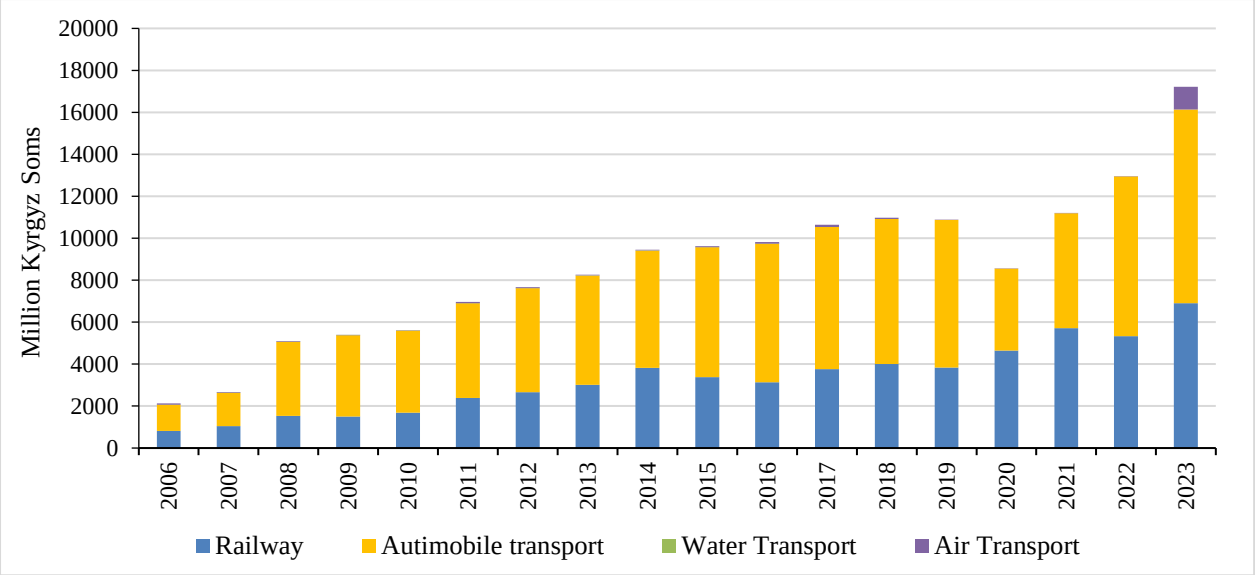



*Figure 2.16. Revenues from Freight Transport by All Types of Transport, 2011–2023*

Despite limited financial resources, the Government of the Kyrgyz Republic continues to prioritize the development of the transport system.

The total length of public roads maintained by the Ministry of Transport and Communications (MTC) of the Kyrgyz Republic is approximately 18,585 km. Roads of cities, other settlements, agricultural, industrial, and other purposes account for an additional 15,190 km. Public roads are classified by economic and administrative function into: international roads with a total length of 4,100 km, republican roads with a length of 5,335 km, and local roads with a length of 9,149 km. The length of public roads with hard surfaces amounts to 7,580 km, including 10 km of cement-concrete, 5,698 km of asphalt-concrete, and 1,871 km of black gravel pavement. Gravel roads account for 9,388 km, while earth roads account for 1,617 km.[149]

According to the MTC, as of today, the vehicle fleet of the Kyrgyz Republic consists of 1,361,114 motor vehicles, including 1,083,096 passenger cars, 228,843 trucks, and more than 39,832 buses and minibuses. According to the National Statistical Committee, citing the State Agency for Vehicle and Driver Registration under the Cabinet of Ministers of the Kyrgyz Republic, the number of individual motor vehicles increased by 245% between 2011 and 2024 (see Figure 2.17).

[149] NSC:https://stat.gov.kg/ru/statistics/transport-i-svyaz/

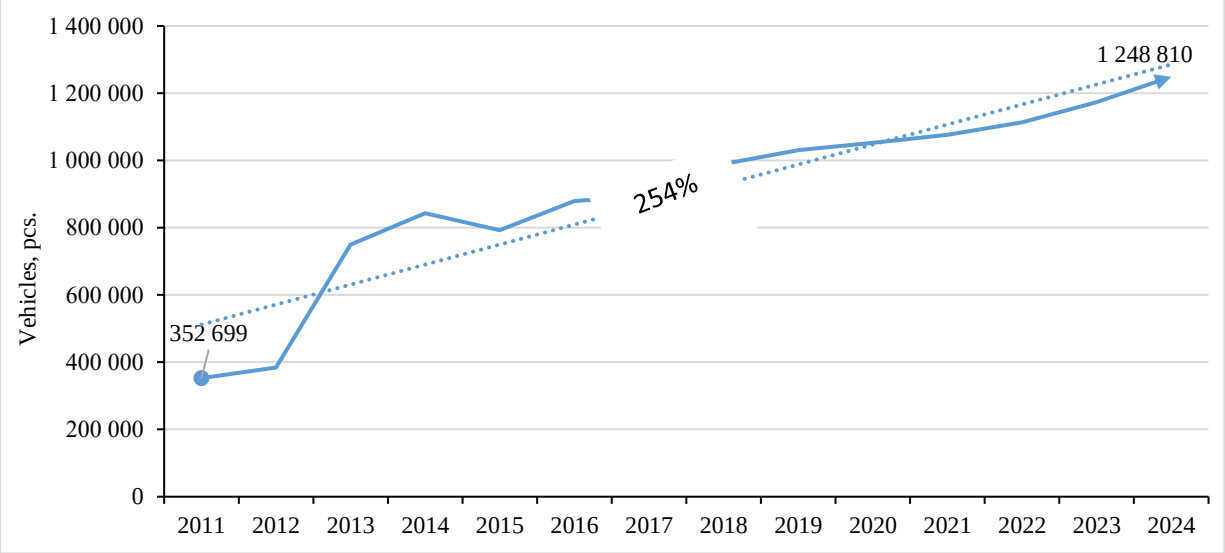



*Figure 2.17. Number of registered vehicles of individual owners* [150]

The road transport sector involves 254 legal entities providing passenger transport services and 138 legal entities providing freight transport services, as well as more than 13,000 individual entrepreneurs engaged in passenger transport and 7,000 individual entrepreneurs engaged in freight transport. In addition, 60 enterprises of structural subdivisions of the Ministry of Transport and Communications (MTC), such as bus terminals and stations, ensure road transport operations [151] These enterprises employ approximately 32,000 people. [152]

Due to the mountainous terrain, the total length of railways in the Kyrgyz Republic is only 424.6 km. The network consists of two geographically separated sections: the northern section, 323.4 km long (Balykchy–Turksib, Kazakhstan), and the southern section, 101.2 km, providing access from the Kyrgyz Republic to the railway networks of neighboring Kazakhstan and Uzbekistan. [153]

Train operations on the Kyrgyz Railway, apart from six new diesel locomotives, are carried out by locomotives built 40 years ago. The normative service life of most locomotives—the main driving force of the Kyrgyz Railway—expired between 1993 and 2001, but they continue to be operated. A similar situation exists with shunting locomotives. The depreciation levels of rolling stock and infrastructure are as follows: diesel locomotives – 88%, freight wagons – 60%, passenger wagons – 63%, and track infrastructure – 35%. [154]

The Kyrgyz Republic has air service agreements with 31 countries, with regular flights operated to cities in Russia, Kazakhstan, Uzbekistan, Tajikistan, China, Turkey, Mongolia, India, the United Arab Emirates, and Kuwait. Currently, 31 regular international and 4 domestic air routes are in operation.

There are four international airports in the Kyrgyz Republic: Manas International Airport, Osh Airport, Karakol International Airport, and Issyk-Kul International Airport, the latter operating only during the summer season. At Manas International Airport, 16 airlines operate flights to and from 22 destinations. At Osh Airport, 9 airlines provide services on 13 routes. [155]

[150] According to the NSC website: https://stat.gov.kg/ru/statistics/transport-i-svyaz/
[151] Website of the Ministry of Transport and Communications:https://mtd.gov.kg/transportnaya-sistema/
[152]https://traceca-org.org/ru/strany/kyrgyzstan/avtomobilnaya-transport/
[153] Key Directions: Concept for the Development of Railway Transport of the Kyrgyz Republic for 2022–2026, approved by Resolution of the Cabinet of Ministers of the Kyrgyz Republic dated 22 May 2022, No. 258.
[154] Cabinet of Ministers of the Kyrgyz Republic. 2022. Key Directions for the Development of Railway Transport of the Kyrgyz Republic for 2022–2026.
[155] World Data. Infrastructure and Transport in the Kyrgyz Republic.https://www.worlddata.info/asia/kyrgyzstan/transport.php

The largest airline in the country in terms of regular passenger traffic and fleet size is Kyrgyzstan Airlines, which operates flights to 10 domestic and international airports. Its current fleet consists of 15 aircraft. The main airlines providing civil passenger transport services in the Kyrgyz Republic are presented in Table 2.9 below.

*Table 2.9. Major National Airlines of the Kyrgyz Republic*[156]

| IATA Code [157] | Airline Name | Call Sign | Fleet Size | Destinations |
|---|---|---|---|---|
| R8 | Kyrgyzstan Airlines | Kyrgyz | 15 | 10 |
| YK | AviaTraffic | Atom | 6 | 16 |
| TEZ | TezJet Airlines | Tezjet | 3 | 6 |
| QH | Air Kyrgyzstan | Altyn Avia | 2 | 3 |
| ZM | Air Manas | Air Manas | 1 | 2 |

The majority of international air transport outside the Kyrgyz Republic is carried out by foreign airlines. Domestic airline airports have long remained unprofitable, due to either the absence or the insufficient number of scheduled flights. A key reason for this situation is that many residents of the regions cannot afford to purchase tickets for domestic flights and instead prefer cheaper and more accessible road transport. Another reason is the lack of aircraft in the fleet of Kyrgyz airlines with a seating capacity of 50–70 seats, which would be suitable for domestic routes.

Water transport exists only on Lake Issyk-Kul and has sharply declined in recent years. The only port of the Kyrgyz Republic is Balykchy, a town on Lake Issyk-Kul. None of the country's rivers are navigable, and there are no shipping canals in the country.

#### *2.1.6.1.6 Legal Framework for the Transport Sector*

The current system of regulatory and legal acts governing activities in the field of road management consists of the following key legal documents:

- Law of the Kyrgyz Republic "On Automobile Roads";
- Law of the Kyrgyz Republic "On the Road Fund";
- Law of the Kyrgyz Republic "On Railway Transport" of 18 July 2016, No. 121;
- Air Code of the Kyrgyz Republic of 6 August 2015, No. 218;
- Draft Law of the Kyrgyz Republic "On Water Transport."

The Law of the Kyrgyz Republic "On Automobile Roads" defines the economic and legal foundations and principles of road management in the country by organizations and enterprises. It addresses and regulates virtually the entire spectrum of issues related to the road sector. However, not all provisions of this Law, particularly those regulating specific areas of activity in the road sector, are implemented due to the absence of a number of secondary legal acts.

The Law of the Kyrgyz Republic "On the Road Fund" establishes the legal framework and sources of financing for the Road Fund of the Kyrgyz Republic, as well as its purpose and utilization. In practice, many provisions of this Law are not implemented. Moreover, the volume of resources from Road Fund sources remains limited and requires revision.

The Law of the Kyrgyz Republic "On Railway Transport" regulates public relations among carriers, state authorities, passengers, consignors, consignees, and both legal and natural persons in the transport of passengers, luggage, cargo, combined cargo-luggage, and mail by rail. It stipulates that railway

[156] Ibid.
[157] International Air Transport Association (IATA).

transport is an integral part of the unified transport system of the Kyrgyz Republic. Railway transport consists of public-use railway transport, non-public-use railway transport, and technological railway transport.

The Air Code of the Kyrgyz Republic establishes the legal framework for the use of the country's airspace and activities in the field of civil aviation to meet the needs of the population for safe air transport. It specifies that the purpose of state regulation and oversight of civil aviation activities and the use of airspace is to ensure the safety of air transport and aviation operations. The provisions of the Code apply to all civil aviation activities carried out on the territory and in the airspace of the Kyrgyz Republic, including: 1) aircraft registered in the State Register of Civil Aircraft of the Kyrgyz Republic; 2) foreign aircraft whose operations are provided for under international treaties that have entered into force in accordance with national legislation and to which the Kyrgyz Republic is a party.

The Draft Law of the Kyrgyz Republic "On Water Transport" regulates public relations among state authorities, legal entities, and individuals in the field of water transport in relation to navigation, the carriage of passengers, luggage, and cargo, and the operation of vessels, including on water bodies not classified as waterways. It also establishes the rights, obligations, and responsibilities of the parties involved.

#### *2.1.6.1.7 Provisions of the National Transport Policy*

The National Development Strategy for 2018–2040 and the National Development Program until 2026 identify transport and logistics integration and the resolution of the country's transport isolation as among the most important priorities. Both programs envisage the following:

- The state will focus its efforts on the rehabilitation and maintenance of roads, the creation of free and safe international transport corridors, including through the application of new technologies in road design and construction.
- A transit railway China–Kyrgyzstan–Uzbekistan will be constructed, along with a railway line connecting the north and south of the country.
- Transport in the Kyrgyz Republic will gradually transition to electric mobility, including electric cars, electric trucks, high-speed electric trains, trolleybuses, and electric buses. In the long term, a network of high-speed charging stations for electric vehicles will be established, and the public vehicle fleet will be gradually converted to electric vehicles.
- During the reconstruction, development, or construction of international and domestic airports, modernization of air traffic management and airspace services in the Kyrgyz Republic will be carried out, with upgrades to radio engineering, radar, navigation, and communications equipment.
- The transport sector development policy will be revised to introduce cost-effective solutions, which, in turn, will reduce pollutant and greenhouse gas emissions.
- Environmentally sustainable urban public transport operating on electric traction and natural gas will be developed. Large- and medium-capacity public transport should cover at least 80 percent of urban passenger flows.
- The main instrument for project implementation in this sphere will be public–private partnerships.

Among the main sectoral policy documents, the following can be highlighted:

- Main Directions for the Development of the Road Sector of the Kyrgyz Republic for 2023–2030.[158] The objective of this document is to promote the economic development of the country by ensuring population access to markets for goods, labor, and social services, as

[158] Approved by Resolution of the Cabinet of Ministers of the Kyrgyz Republic No. 71 of 10 February 2023.

well as to achieve the sustainable functioning of the road sector through improved road management systems.

To achieve this objective and to direct efforts towards maintaining international transport corridors in good structural condition, improving international corridors passing through the territory of the Kyrgyz Republic, as well as priority highways of republican and local significance, the following priorities have been identified:

1. Further efficient functioning of the restructured road management system;
2. Transport and logistics integration and addressing the problem of the country's transport isolation;
3. Development and safety of transport infrastructure to ensure comfortable, safe, and uninterrupted movement of passengers and goods;
4. Introduction of intelligent transport systems (ITS);
5. Improvement of road traffic safety.

- Resolution of the Cabinet of Ministers "On Measures for the Transformation of the Road Management System."[159] This document provides for structural changes within the systems of the Ministry of Transport and Communications, aimed at optimizing organizational structures, and establishes a new organizational management scheme (see Figure 8).

- Main Directions for the Development of Railway Transport of the Kyrgyz Republic for 2022–2026[160] These directions outline the conceptual framework for the development of railway transport, including the following:

1. Strengthening the export and transit potential of the Kyrgyz Republic and integrating into international transport systems;
2. Reconstruction and modernization of the fixed assets of the railway sector, including electrification of key railway sections;
3. Enhancement of the railway traffic safety system;
4. Improvement of the quality and accessibility of railway transport services;
5. Development of human resource capacity in the railway sector of the Kyrgyz Republic;
6. Expansion of public–private partnerships in the implementation of projects for the renewal and modernization of the railway transport assets of the Kyrgyz Republic.

The overarching objective of the sector is to create the conditions necessary to ensure economic growth and social well-being in the Kyrgyz Republic through the effective and full satisfaction of the needs of the economy, businesses, and the population in safe railway transportation. Among the sector's priorities are the following:

- Improving the quality of life of the population and the competitiveness of the Kyrgyz economy;
- Establishing a domestic railway network and developing the transit potential of the country;
- Reconstruction and modernization of railway infrastructure;
- Strengthening the human and scientific capacity of Kyrgyz Railway.

- The Ministry of Transport and Communications has developed the **Concept for the Development of Civil Aviation of the Kyrgyz Republic for 2021–2025.** It provides that state support for the

[159] Resolution No. 346 of 24 December 2021.
[160] Resolution No. 258 of 20 May 2022.

development of regional airports and national airlines in the acquisition of aircraft must be strengthened, including the provision of benefits to carriers performing domestic flights. Despite the current state of airport infrastructure, the Kyrgyz Republic enjoys a favorable geographical location and has significant potential for the development of transit air transportation.

The goal is to enhance flight safety and to double the volume of air transportation, both on domestic and international routes. The Concept identifies the following development priorities for the sector:

- Improving the level of flight safety of national carriers;
- Enhancing the system of state management of civil aviation;
- Renewal of the aircraft fleet;
- Establishment of a modern aircraft maintenance center;
- Improvement of the human resource system for civil aviation;
- Enhancement of the air traffic management system;
- Development of airport infrastructure in the Kyrgyz Republic;
- Development of ultralight and light aviation in the Kyrgyz Republic;
- Expansion of the geography of flights.

At present, there is no development strategy for the water transport sector in the Kyrgyz Republic.

#### *2.1.6.1.8 Institutional Mechanisms and Governance of the Transport Subsector*

The state regulator responsible for defining and implementing policies for the development of transport and road infrastructure is the **Ministry of Transport and Communications of the Kyrgyz Republic.**

In addition to the Ministry, important stakeholders in the transport sector include:

- Civil Aviation State Agency under the Cabinet of Ministers of the Kyrgyz Republic;
- State Enterprise Production and Innovation Center;
- State Enterprise Design and Survey Institute “Kyrgyzdortransproekt”;
- State Enterprise KyrgyzAvtoZhol;
- State Enterprise National Company “Kyrgyz Railway”;
- State Enterprise KyrgyzAeronavigation;
- State Enterprise Kyrgyz Bus Stations;
- Kyrgyz Technical University named after Razzakov.

#### *2.1.6.1.9 Greenhouse Gas Emissions in the “Energy” Sector and the “Transport” Subsector*

Greenhouse gas emissions in the energy sector, when considered from the base year 1990, clearly reflect the historical trajectory of the Kyrgyz Republic following the collapse of the USSR, when economic, political, and social integration links abruptly disappeared, and independent Kyrgyzstan had to undergo economic decline and a decrease in living standards, followed by gradual recovery and a return to the path of sustainable development.

The energy sector has consistently been the main source of emissions in the Kyrgyz Republic. The dynamics of GHG emissions are presented in Figure 2.18.

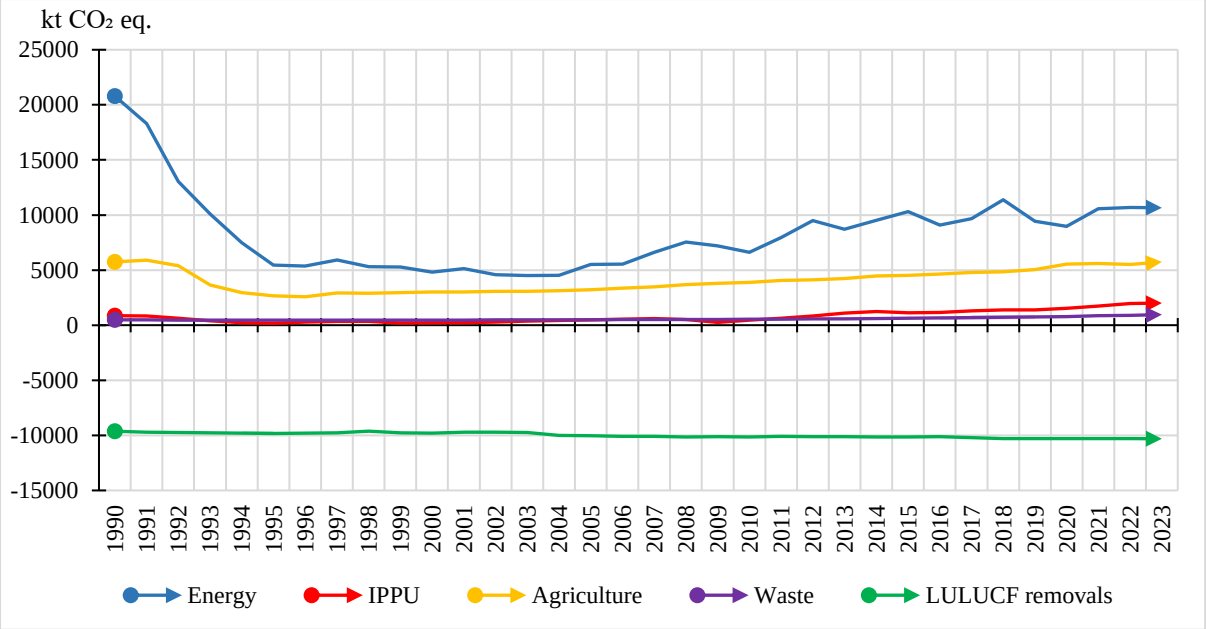



*Figure 2.18. Dynamics of Greenhouse Gas Emissions and Removals in the Kyrgyz Republic in 1990–2023 by Sources*[161]

Since 1990, the total volume of emissions from the energy sector has decreased by 48.8%, while its share in national emissions has declined from 74% to 55%. In 2023, the sector's total emissions amounted to 10,653.384 kt $CO_2$ eq., which is 10.2% higher than in the Nationally Determined Contribution base year.[162].

The dynamics of emissions in the "Energy" sector by categories generally demonstrate a downward trend compared to 1990, with the exception of the "Transport" category (see Figure 2.19).

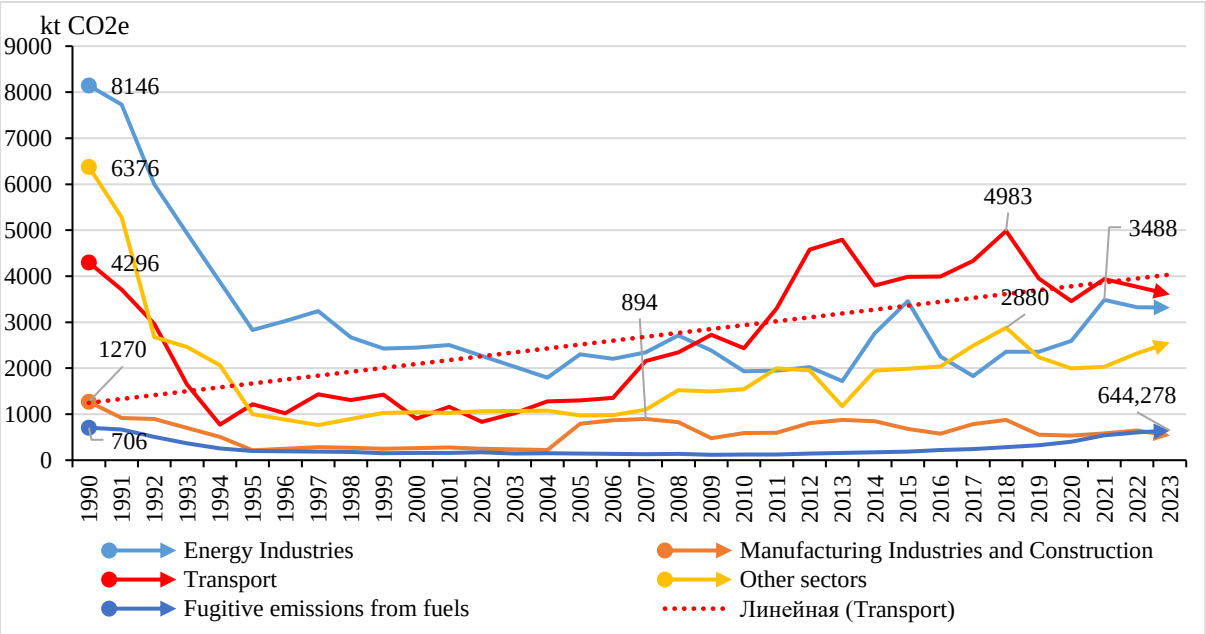



*Figure 2.19. GHG Emissions in the Energy Sector by Source, 1990–2023*

[161] Ministry of Natural Resources, Ecology and Technical Supervision of the Kyrgyz Republic. 2025. National Inventory Document for 1990–2023.

[162] Ministry of Natural Resources, Ecology and Technical Supervision of the Kyrgyz Republic. 2025. National Inventory Document for 1990–2023.

Compared to 1990, emissions in 2023 decreased as follows: by 59.3% in the category Energy Industries, by 59.9% in Other Sectors (institutional/commercial and residential), by 58.2% in Manufacturing Industries and Construction, by 16.2% in Transport, and by 8.7% in Fugitive Emissions from Fuels.

It should be noted, however, that emissions in the Transport category decreased by 16.9% in 2023 compared to 2017.

The contribution of emission categories to the total energy sector emissions in 2023 has shifted compared to 1990: the share of the Transport category increased by 15 percentage points, evidently due to decreases in Energy Industries by 8 percentage points and Other Sectors by 6 percentage points (see Figure 2.20).

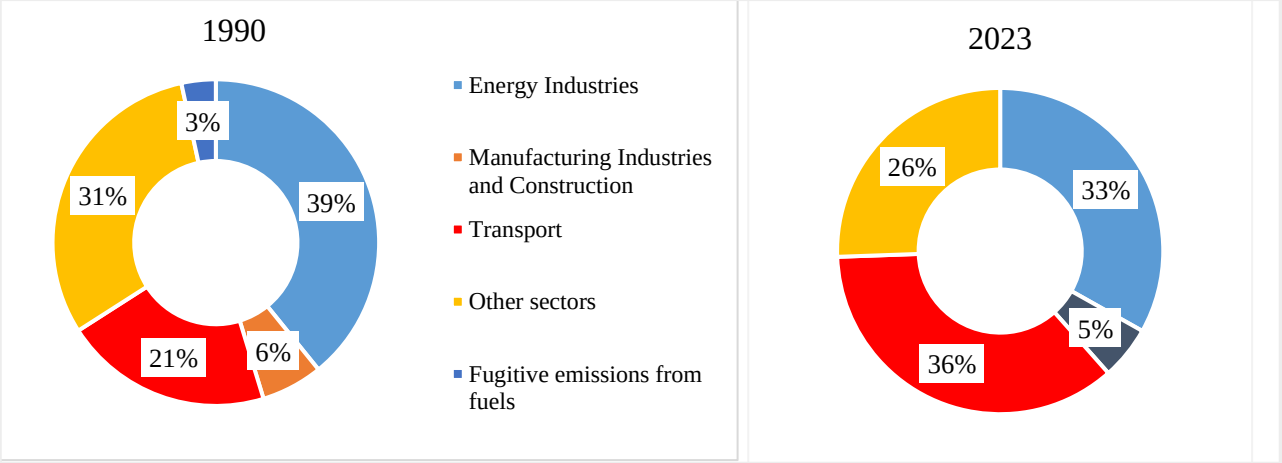



*Figure 2.20. Greenhouse Gas Emissions in the Energy Sector by Source, 1990 and 2023*

The Transport category is among the key source categories, with emissions amounting to 3,601.417 kt $CO_2$ eq. in 2023. The main contribution within this category comes from the Road Transport subcategory.

### *2.1.6.2 Industrial Processes and Product Use (IPPU)*

Today, industry in the Kyrgyz Republic represents one of the core sectors of the economy, accounting for approximately 16.0% of GDP, around 18.0% of tax revenues to the republican budget, and more than 80.0% of export supplies. In 2023, industrial output amounted to 495.3 billion KGS.[163] The physical volume index compared to 2022 was 102.7%, and compared to 2018 — 124.5%.

Employment in industry in 2023 reached 136.9 thousand people, which reflects a decline of 4.1% compared to 2019, but an increase of 6.9% compared to the previous year. The average monthly nominal wage of industrial workers in 2023 amounted to 42.0 thousand KGS.

The share of gross added value (GAV) in gross domestic product in 2023 was 16.0% (compared to 17.6% in 2019). The dynamics of industrial production growth in the Kyrgyz Republic from 1990 to 2023 are presented in Figure 2.21.

[163] NSC. Industry of the Kyrgyz Republic. 2019–2023. Bishkek, 2024.

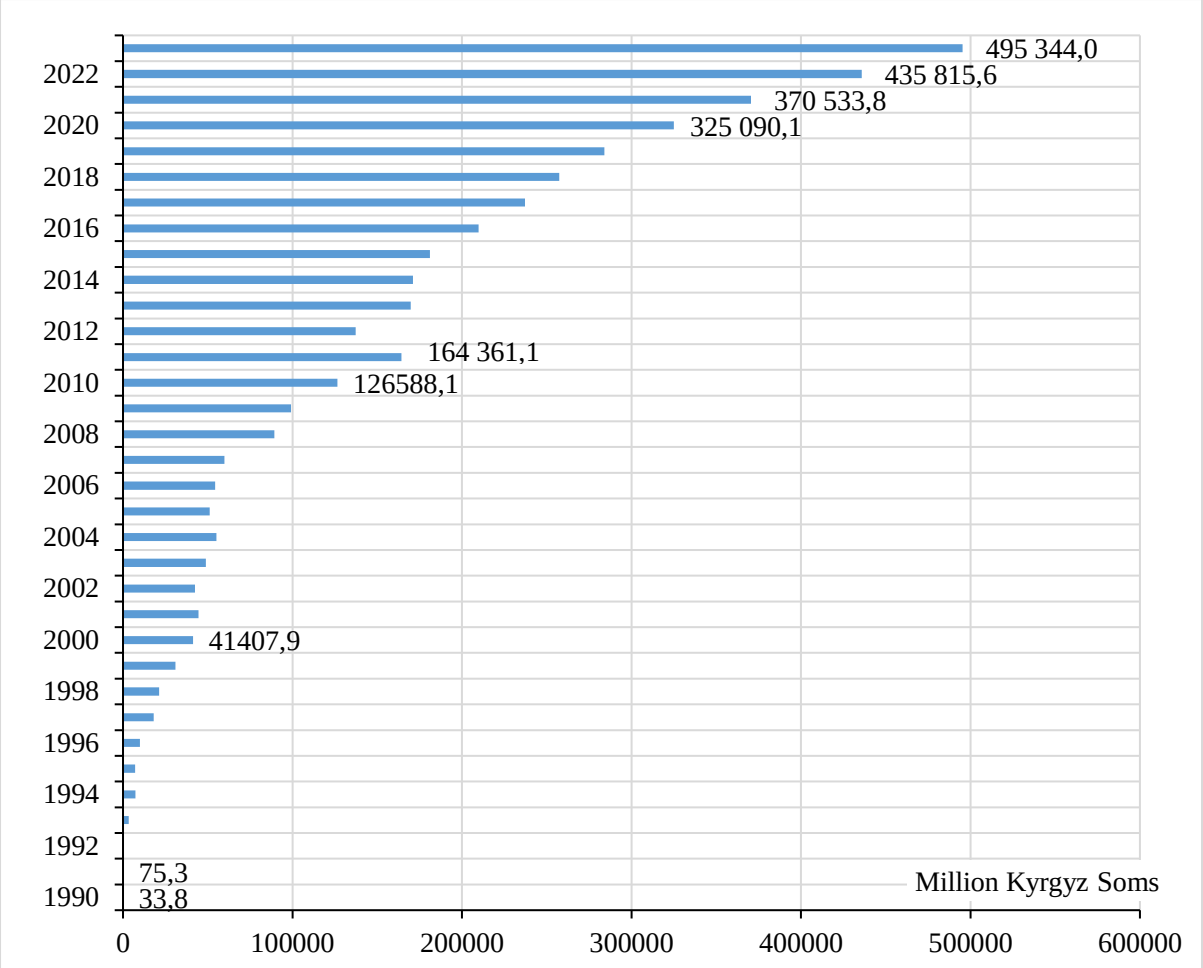



*Figure 2.21. Dynamics of Industrial Development of the Kyrgyz Republic, 1990–2023*[164]

The bulk of industrial output (up to 90%) is produced by six core, economy-forming industries, five of which fall under the category of manufacturing (see Figure 2.25). According to the results of 2023, the sectoral shares were as follows:

- Manufacture of basic metals and fabricated metal products, except machinery and equipment — 45.7%;
- Manufacture of food products (including beverages) and tobacco products — 15.0%;
- Manufacture of coke and refined petroleum products — 1.2%;
- Manufacture of rubber and plastic products, other non-metallic mineral products (construction materials) — approximately 8.7%;
- Textile manufacturing, production of apparel and footwear, leather and related products — 3.5%;
- Supply of electricity, gas, steam, and air conditioning — 10.3% (see Figure 2.22).

[164] NSC. Dynamic Tables. Industrial Output by Type of Economic Activity. https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fstat.gov.kg%2Fru%2Fstatistics%2Fdownload%2Fdynamic%2F340%2F&wdOrigin=BROWSELINK

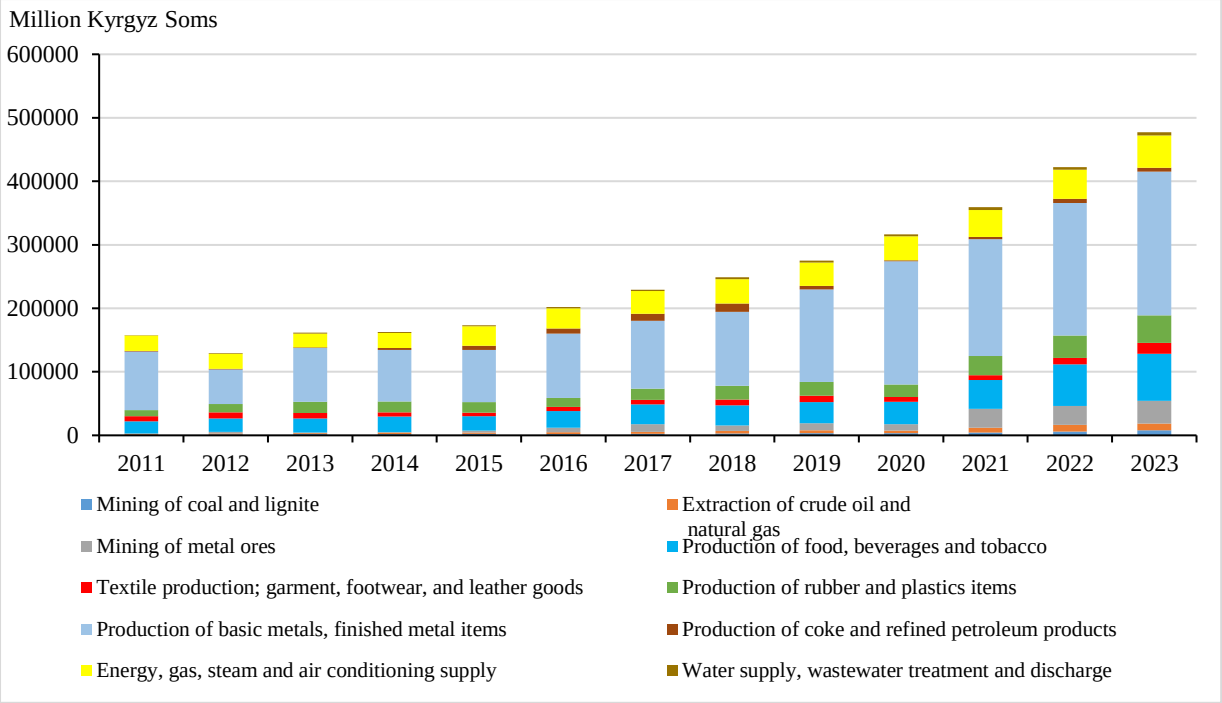



*Figure 2.22. Dynamics of Production in Six Core Industrial Sectors of the Kyrgyz Republic in 2022–2023.*[165]

In 2023, compared to the previous year, growth in industrial output was observed across almost all activities, with the exception of basic metals and fabricated metal products, electrical equipment, and machinery and equipment, where production volumes decreased by 11.0%, 8.2%, and 26.1%, respectively.[166]

In manufacturing, the output in 2023 amounted to 383.1 billion KGS, representing an increase of 27.7% compared to 2019 and 2.0% compared to 2022. Growth in manufacturing was primarily driven by an increase of 70% in the production of rubber and plastic products and other non-metallic mineral products (1.7 times), an increase of 19.6% in wood and paper products and printing activities, an increase of 19.2% in textiles, apparel, footwear, leather and related products, an increase of 8.9% in petroleum products, and an increase of 5.7% in food products (including beverages) and tobacco.[167]

The output of food products (including beverages) and tobacco products amounted to more than 74 billion KGS, which is 29.1% higher compared to 2018 and 5.7% higher compared to 2022. This growth was supported by an increase of 8.8% in the production of flour and cereals, 1.4% in pasta, 16.4% in bread and bakery products, 22.5% in meat products, as well as 47.6% in beverages, largely driven by an increase of 28.8% in the production of distilled alcoholic beverages.[168]

In 2023, output in textiles, apparel, footwear, leather, and related products increased by 19.2% compared to the previous year, mainly due to a 30.0% increase in apparel production. Compared to 2018, output in this group rose by 11.7%. Production of refined petroleum products increased by 8.9% in 2023 compared to the previous year, but declined by 52.0% compared to 2018. The output of rubber

[165] NSC. Dynamic Tables. Industrial Output by Type of Economic Activity. https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fstat.gov.kg%2Fru%2Fstatistics%2Fdownload%2Fdynamic%2F340%2F&wdOrigin=BROWSELINK
[166] NSC. Industry of the Kyrgyz Republic. 2019–2023. Bishkek, 2024.
[167] NSC. Industry of the Kyrgyz Republic. 2019–2023. Bishkek, 2024.
[168] NSC. Industry of the Kyrgyz Republic. 2019–2023. Bishkek, 2024.

and plastic products and other non-metallic mineral products increased 2.1 times compared to 2019 and 1.7 times compared to 2022. [169]

The output of basic metals and fabricated metal products increased by 19.8% compared to 2019, but declined by 11.0% compared to 2022. The decline was driven by a 13.5% decrease in the production of precious metals relative to the previous year.

The output of electricity, gas, steam, and air conditioning supply in 2023 amounted to 51 billion KGS, which represents an increase of 8.4% compared to the previous year, mainly due to a 7.3% increase in electricity generation, transmission, and distribution. However, compared to 2018, output in this category decreased by 0.2%. [170]

The results of a survey of 849 industrial enterprises showed that their innovation activity in 2023 amounted to 1.8% (compared to 3.8% in 2022). A total of 15 enterprises carried out the development and implementation of innovations in industry. At two enterprises, innovation processes were completed and industrial production was launched, while at 13 enterprises innovation processes remained in the finalization stage. Innovation-active enterprises mastered and produced 42 new types of products, including 39 types of radiators for trucks and agricultural machinery, one type of electric lamp ("BI spiral gas-filled"), as well as glass roving and fiberglass. he highest levels of innovation activity were recorded at enterprises producing food products, apparel, electrical equipment, and transport vehicles, as well as in coal and lignite extraction.[171]

The Ministry of Economy and Commerce (MEC) of the Kyrgyz Republic is responsible for state management of industrial development.

In 2023, the volume of the informal economy, estimated on the production side, amounted to 256.5 billion KGS, or 19.2% of GDP. The share of the non-observed economy relative to GDP in 2023 decreased by one percentage point compared to the previous year. This reduction was primarily driven by a decline of 0.5 percentage points in wholesale and retail trade (including repair of motor vehicles and motorcycles), 0.4 percentage points in construction, and 0.2 percentage points in transport activities and freight storage.

The persistently high share of the informal sector in the economy also remains a negative factor for industrial development, creating unequal conditions of competition for bona fide investors. According to business surveys, other key factors hindering investment include a high level of corruption, insufficient protection of property rights, difficulties in gaining access to electricity and other utility services, as well as challenges related to local communities.

In 2019, the Government of the Kyrgyz Republic adopted the Strategy for Sustainable Industrial Development of the Kyrgyz Republic for 2019–2023[172], which identified the following priority areas for industrial development:

- improvement of the legal and regulatory framework in the field of industry;
- creation of a competitive environment and the establishment of equal and predictable conditions for economic activity in industry and in specific markets;
- organizational restructuring of industrial production companies aimed at enhancing management efficiency, broad diversification of production, globalization of activities, development

[169] NSC. Industry of the Kyrgyz Republic. 2019–2023. Bishkek, 2024.
[170] Ibid.
[171] Ibid.
[172] Approved by Resolution of the Government of the Kyrgyz Republic No. 502 of 27 September 2019.

of mutually beneficial relations with consumers, and fostering cooperation between enterprises at both the national and international levels to address complex scientific, technical, and production challenges more rapidly and at lower cost;
- ensuring profitable production and sustainable financial standing of industrial enterprises, including the coverage of current and one-time expenditures for production development through internal resources;
- further improvement of market mechanisms and institutions, as well as optimization of the structure of the public sector in line with the need to increase the efficiency of state property management.

The Strategy emphasizes that industry in the Kyrgyz Republic should serve as the foundation of the country's socio-economic development and as a source of improved living standards for the population, while minimizing negative impacts on the environment.

The overarching goal of the Strategy is to achieve sustainable growth rates of industrial production based on a consistent transition to an industrial-innovation pathway, increased production efficiency, and enhanced competitiveness of products.

To achieve this overarching goal, the following Objectives must be addressed:

- development of industry taking into account the specialization of the regions of the Kyrgyz Republic and the ongoing processes of regional integration with other countries;
- expansion of high-tech, competitive export-oriented industries to ensure the transition of the national economy from a raw material export model to an industrial-innovation type of development;
- creation of an effective system of state administration in industry and favorable conditions for attracting investment.

#### *2.1.6.2.1 Greenhouse Gas Emissions in the Sector "Industrial Processes and Product Use"*

Greenhouse gas emissions in the IPPU sector, when considered from the 1990 base year, clearly reflect the economic trajectory of the Kyrgyz Republic following the dissolution of the USSR, when economic and integration linkages were abruptly disrupted and the newly independent Kyrgyz Republic experienced an economic downturn and a decline in living standards, followed by a period of recovery and a return to the path of sustainable development.

The dynamics of GHG emissions in the IPPU sector mirror the sharp decline in industrial production that accompanied the recession of the national economy during the period 1990–2000, and the subsequent gradual return to a period of stable economic development from 2000 to 2023.

In terms of overall GHG emission trends, in 2000 compared to 1990, GHG emissions in the IPPU sector decreased by 73.9% and amounted to 227.858 kt $CO_2$ eq. Between 2000 and 2017, emissions in the sector increased by 470.2%, reaching 1,373.851 kt $CO_2$ eq. The COVID-19 period did not have a significant impact on sectoral emissions, which in 2020 stood at 1,527.407 kt $CO_2$ eq.

In 2023, emissions in the IPPU sector amounted to 2,008.043 kt $CO_2$ eq., or 10.4% of total national emissions of the Kyrgyz Republic, representing an increase of 54.7% compared to the 2017 NDC base year. [173]

[173] Ministry of Natural Resources, Ecology and Technical Supervision of the Kyrgyz Republic. 2025. National Inventory Document for 1990–2023.

Three direct greenhouse gases are emitted in the sector, namely carbon dioxide ($CO_2$), nitrous oxide ($N_2O$), and hydrofluorocarbons. The assessment of HFC emissions in the Kyrgyz Republic began in 1995.

Since 1990, total GHG emissions in the IPPU sector have increased by 130.4%, while the sector's share in total national emissions has risen from 3% to 10%.[174] (see Figure 2.21 above)

The dynamics of emissions in the IPPU sector by category overall demonstrate a clear upward trend compared to 1990 (see Figure 2.23).

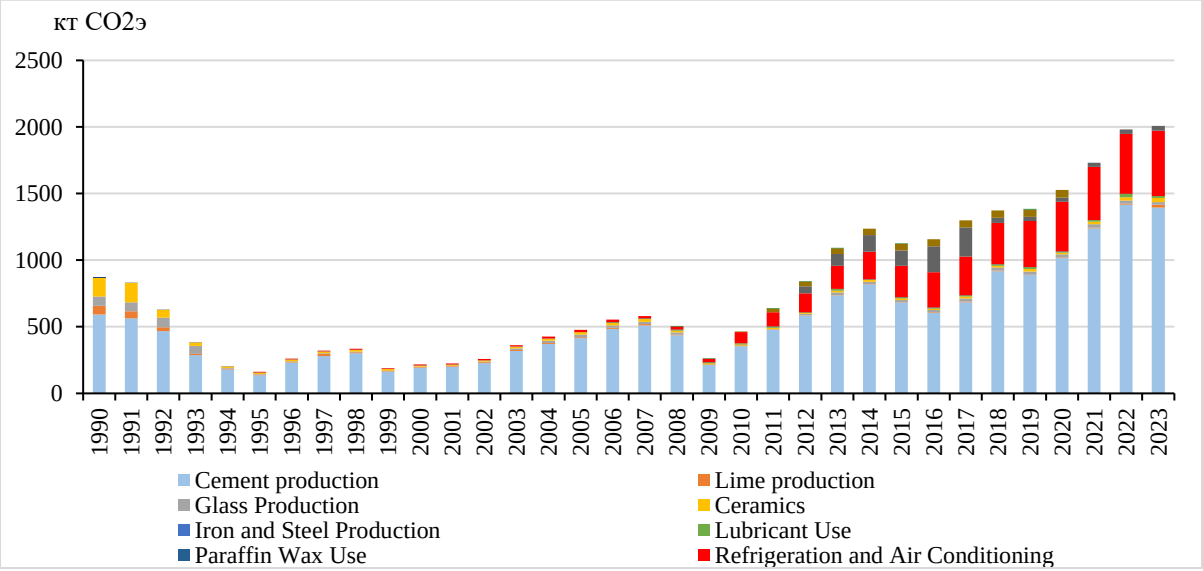



*Figure 2.23. GHG Emissions in the IPPU Sector by Source Categories in 1990–2023.*

Compared to 1990, in 2023 emissions in the category Cement Production increased by 136%, while emissions in the category Lime Production decreased by 69.1%, in Glass Production decreased by 71.2%, and in Ceramics decreased by 79.62%.

The contribution of emission categories to total IPPU sector emissions in 2023 also changed significantly compared to 1990. In 1990, emissions from the category Mineral Products Production accounted for 100% of total sectoral emissions. By 2023, the share of this category in total IPPU sector emissions had decreased by 27 percentage points, while emissions from the category Use of Substitutes for Ozone-Depleting Substances emerged, accounting for 26.2% of sectoral emissions in 2023 (see Figure 2.24).

[174] Ministry of Natural Resources, Ecology and Technical Supervision of the Kyrgyz Republic. 2025. National Inventory Document for 1990–2023.

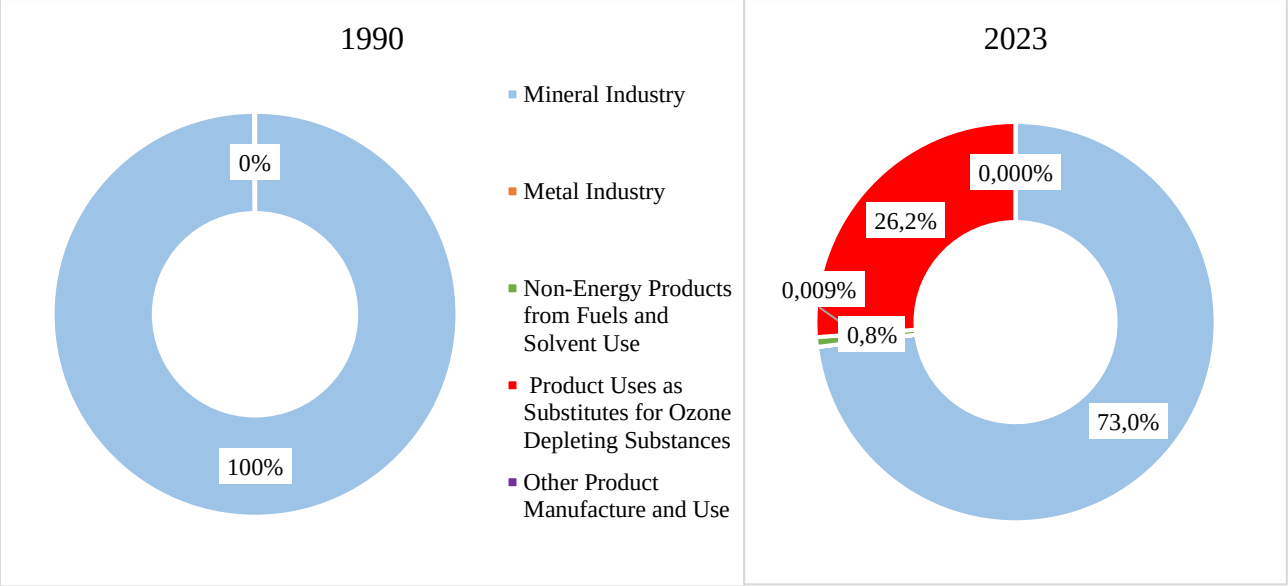



*Figure 2.24. GHG in the IPPU Sector by Source Categories in 1990 and 2023.*

The subcategories *Cement Production* and *Use of Substitutes for Ozone-Depleting Substances* are among the key source categories for GHG emissions in the Kyrgyz Republic.

### *2.1.6.3 Agriculture*

Agricultural policy for the development of the sector and the management of water resources is determined by the **Ministry of Water Resources, Agriculture and Processing Industry of the Kyrgyz Republic (MWRAPI).** The regulatory and legal framework governing agricultural development includes a wide range of legislative documents, among which the following are of particular importance:

1. Land Code of the Kyrgyz Republic (June 2, 1999, No. 45). The Code regulates land relations in the Kyrgyz Republic, including the grounds for the emergence, procedures for the exercise and termination of land rights, and their registration. It also aims to establish land market relations under conditions of state, municipal, and private ownership of land, as well as the rational use and protection of land resources.
2. Water Code of the Kyrgyz Republic (January 12, 2005, No. 8). This Code regulates water relations in the sphere of use, protection, and development of water resources to ensure guaranteed, sufficient, and safe water supply for the population of the Kyrgyz Republic, environmental protection, and the rational development of the national water fund.
3. Law of the Kyrgyz Republic "On the Entry into Force of the Land Code of the Kyrgyz Republic" (June 2, 1999, No. 4). This Law establishes that the right of private ownership of land plots is recognized for citizens of the Kyrgyz Republic who, prior to the entry into force of the Land Code, had obtained in the prescribed manner the right to permanent or temporary use of land, or to life-long inheritable possession of land plots, without any re-registration of documents, gratuitously and without additional payment, specifically:

    - the right to land shares;
    - the right to household, garden, and dacha land plots;
    - the right to land plots allocated for residential and dacha houses;
    - the right to land plots for the construction of residential and dacha houses.

1. Law of the Kyrgyz Republic "On Food Security of the Kyrgyz Republic" (August 4, 2008, No. 183). This Law establishes the main directions in the field of ensuring food security, which constitutes an integral and essential component of the national security of the State.
2. Law of the Kyrgyz Republic "On the Development of Agriculture in the Kyrgyz Republic" (May 26, 2009, No. 166). The Law defines legal relations between citizens, legal entities, state executive authorities, and local self-government bodies to ensure positive outcomes in the development of the agri-food sector of the Kyrgyz economy.
3. Law of the Kyrgyz Republic "On the Protection of Soil Fertility of Agricultural Lands" (August 10, 2012, No. 165). This Law regulates relations in the field of soil conservation, fertility protection, maintenance of soil quality, and prevention of degradation and other adverse impacts associated with the ownership, use, and management of agricultural lands.
4. Law of the Kyrgyz Republic "On the Management of Agricultural Lands" (January 11, 2001, No. 4). This Law regulates legal relations concerning the management of agricultural lands and aims to ensure their efficient and safe use in the interests of the people of the Kyrgyz Republic.
5. Law of the Kyrgyz Republic "On Organic Agricultural Production in the Kyrgyz Republic" (May 18, 2019, No. 65). The Law defines the legal foundations for organic agricultural production and certification, regulates relations among certification bodies, producers of organic agricultural products, physical and legal entities, and authorized government agencies, and creates conditions for the development of the domestic market of organic agricultural products to meet population demand and increase exports.
6. Law of the Kyrgyz Republic "On Veterinary Medicine" (December 30, 2014, No. 175). This Law establishes the legal, social, organizational, and financial-economic foundations in the field of veterinary medicine, aiming to protect the population from diseases common to humans and animals, and to ensure epizootic well-being and veterinary-sanitary safety throughout the Kyrgyz Republic.
7. Law of the Kyrgyz Republic "On Water" (January 14, 1994, No. 1422-XII). This Law defines the objectives and Objectives of water legislation, including regulating relations in the field of use and protection of water resources, preventing environmentally harmful impacts of economic and other activities on water bodies and facilities, improving their condition, and strengthening the rule of law in the area of water relations.
8. Law of the Kyrgyz Republic "On Peasant (Farm) Enterprises" (June 3, 1999, No. 47). The Law establishes the legal foundations, procedures for establishment and operation of peasant (farm) enterprises, defines their rights and responsibilities, and aims to create conditions for their equitable development alongside other forms of economic activity.
9. Law of the Kyrgyz Republic "On Pastures" (January 26, 2009, No. 30). This Law stipulates that the management, improvement, and use of pastures shall be regulated by the Land Code of the Kyrgyz Republic, this Law, and other relevant legislation. Normative acts of state bodies and local self-government related to pasture management, improvement, and use, except for pastures of the State Forest Fund, must comply with the provisions of the Land Code and this Law.
10. Law of the Kyrgyz Republic "On Breeding in Animal Husbandry of the Kyrgyz Republic" (April 27, 2009, No. 133). The Law establishes the legal, economic, and organizational foundations of breeding activities, production, and use of breeding products (materials), and is aimed at preserving and increasing the gene pool of breeding animals, as well as improving their productivity.
11. Law of the Kyrgyz Republic "On Seeds" (June 19, 1997, No. 38). This Law defines the main provisions regulating the production, certification, marketing, and use of seed and planting materials of all types of plants. It also provides the legal foundations for the activities of seed industry actors and regulates their relations with other entities in the seed sector.

12. Law of the Kyrgyz Republic "On the Use of Chemicals and Plant Protection" (January 25, 1999, No. 12). This Law defines the general legal, economic, environmental, social, and organizational foundations of chemical use and plant protection in the interests of public health, environmental protection, and the prevention or elimination of the consequences of soil, plant, and animal product contamination.
13. Law of the Kyrgyz Republic "On Aquaculture, Fisheries and Protection of Aquatic Biological Resources" (March 17, 2021, No. 35). The Law regulates public relations in the field of aquaculture, use, reproduction, and protection of aquatic biological resources, their habitats, and fisheries within the Kyrgyz Republic. The provisions of this Law do not apply to aquaculture and fisheries production in isolated water bodies (ponds, flooded quarries, and other artificially created reservoirs) that are privately owned.

The state regulator responsible for defining and ensuring the implementation of national agrarian policy for the development of agriculture, water resources, and the processing industry is the Ministry of Water Resources, Agriculture and Processing Industry of the Kyrgyz Republic (MWRAPI).

- Other key stakeholders in the sector include the following:
- Water Resources Service
- Land and Water Supervision Service
- Department of Breeding Livestock, Pastures and Fodder
- Department of Agricultural Crop Expertise
- Department of Chemicalization, Plant Protection and Quarantine
- Department of Processing Industry and Organic Agriculture
- Department of the Fisheries Complex
- Department of Mechanization, Innovative Technologies and Agricultural Cooperation
- Veterinary Service
- Livestock and Pasture Research Institute
- Crop Research Institute
- State Enterprise "AgroSmart"
- Kyrgyz National Agrarian University named after Skryabin

#### *2.1.6.3.1 Greenhouse Gas Emissions in the Agriculture Sector*

Greenhouse gas emissions in the agriculture sector, when assessed from the 1990 base year, clearly reflect the economic trajectory of the Kyrgyz Republic following the dissolution of the USSR, when economic and integration linkages as well as production and supply chains of agricultural products were disrupted. As a result, independent Kyrgyzstan faced a decline in its economy and living standards, followed by a gradual recovery and a return to the path of sustainable development.

The dynamics of GHG emissions in the agriculture sector illustrate a sharp reduction in agricultural output during the national economic recession of 1990–1996, followed by a gradual recovery and stable development of the sector during the period 1997–2023.

With regard to overall GHG emission trends, in 2000, compared to 1990, emissions from the agriculture sector decreased by 47.8%, amounting to 3,002.302 kt CO2 eq compared to 5,746.389 kt CO2 eq in 1990. During 2000–2017, emissions from the sector increased by 59.7% and reached 4,795.031 kt CO2 eq. The COVID-19 period had no impact on the sector, and in 2020 emissions totaled 5,543.896 kt CO2 eq.

In 2023, emissions from the sector amounted to 5,754.413 kt CO2 eq, representing 10.4% of total national emissions of the Kyrgyz Republic, which is 0.1% higher than in 1990 and 20% higher than in 2017. [175]. This makes agriculture the second-largest source sector of GHG emissions in the country.

The sector emits three direct greenhouse gases: carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O). Estimates of CO2 emissions in agriculture have been carried out since 2006.

In 2023, GHG emissions by gas in the agriculture sector were as follows: CO2 emissions: 14.924 kt CO2 eq; CH4 emissions: 3,962.543 kt CO2 eq; N2O emissions: 1,776.946 kt CO2 eq. These figures represent a significant increase compared to 1990 levels. Specifically, CO2 emissions have increased by 146.2% since 2006, CH4 emissions rose by 14.3% compared to 1990, while N2O emissions decreased by 22.5%.[176]

The dynamics of GHG emissions by gas type in the agriculture sector during 1990–2023 are presented in Figure 2.25.

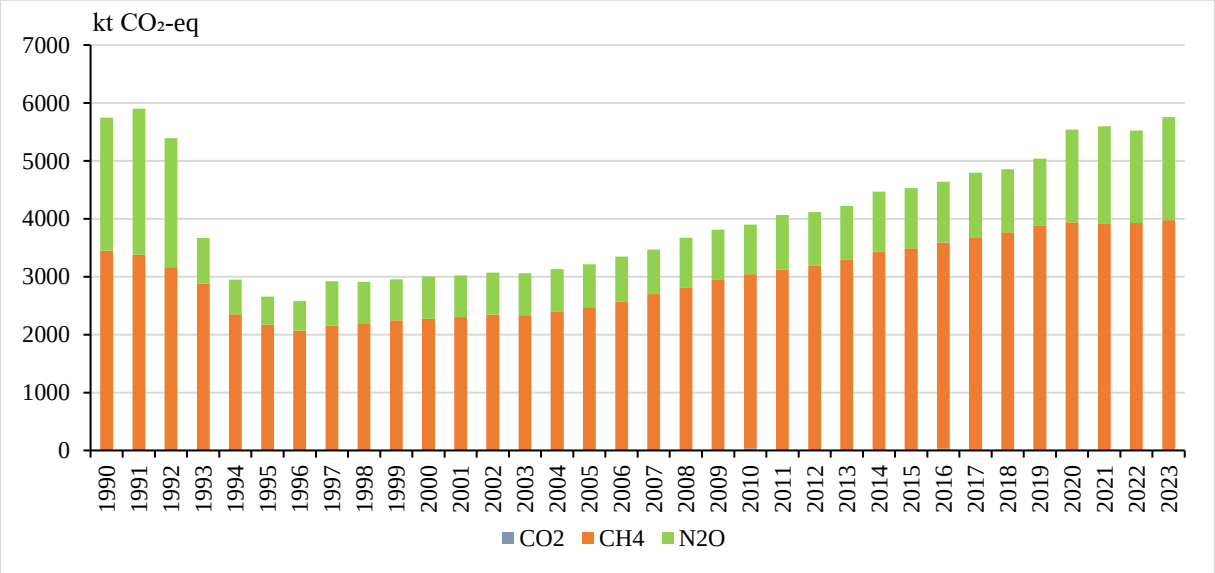



*Figure 2.25. GHG emissions trend by gas type in the period 1990–2023.*[177]

In total, emissions from the agriculture sector in 2023 increased by only 0.1% compared to 1990, while the sector's share in national GHG emissions grew from 21% to 30%.[178] (see Figure 2.25 above).

The dynamics of emissions by source categories during 1990–2023 demonstrate a general upward trend starting from 1996 (see Figure 2.26).

[175] Ministry of Natural Resources, Ecology and Technical Supervision of the Kyrgyz Republic. 2025. National Inventory Document for 1990–2023.
[176] Ibid.
[177] Ministry of Natural Resources, Ecology and Technical Supervision of the Kyrgyz Republic. 2025. National Inventory Document for 1990–2023.
[178] Ibid.

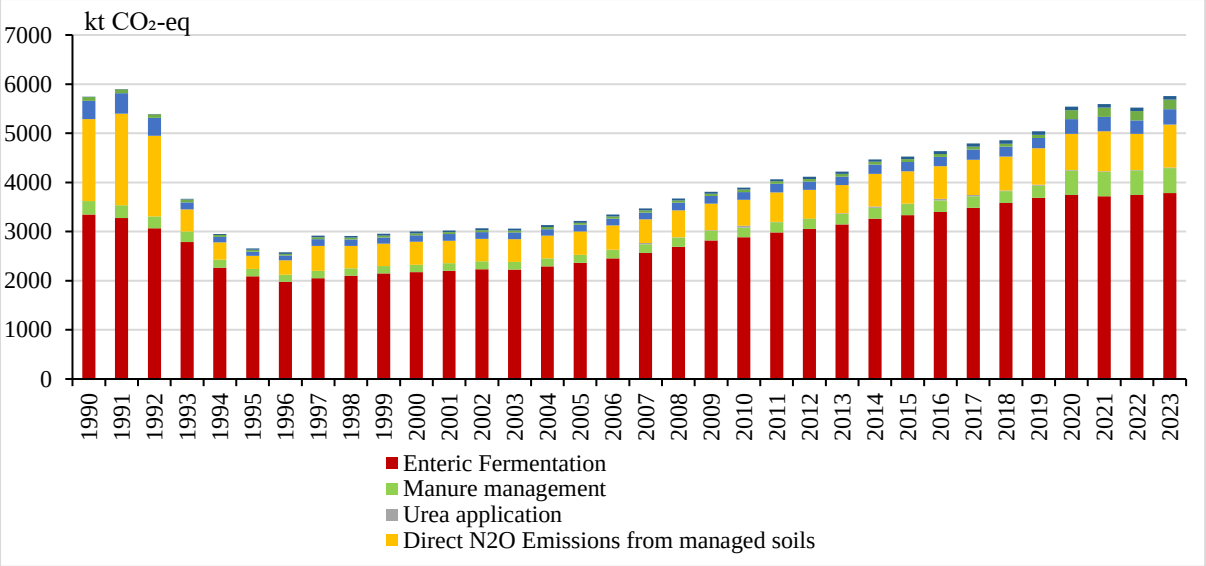
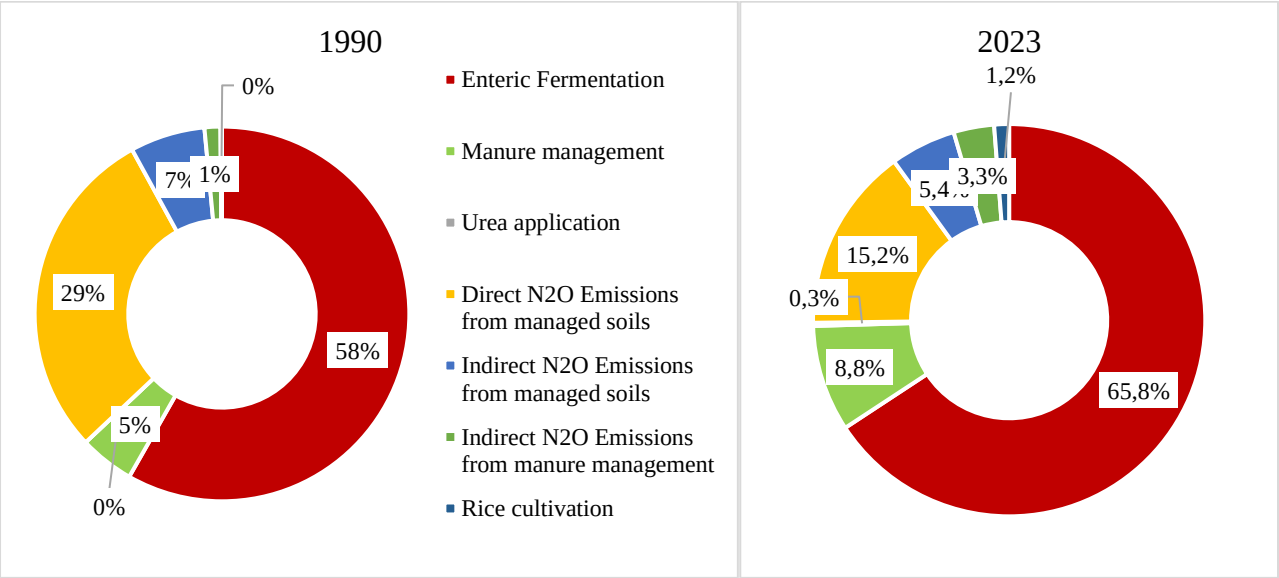



*Figure 2.26. Greenhouse gas emissions in the agriculture sector by source category for the period 1990-2023.*

Compared to 1990, emissions in the category Enteric Fermentation increased by 13% in 2023. Emissions from Manure Management rose by 85.6%. Emissions from Rice Cultivation increased by 847.7%. Emissions from Indirect N2O Emissions from Manure Management increased by 144.3%. By contrast, emissions from Direct N2O Emissions from Managed Soils decreased by 47.5%, while emissions from Indirect N2O Emissions from Managed Soils decreased by 16.2%. Emissions from Urea Application in 2023 were 146.2% higher than in 2006.[179]

The contribution of source categories to total emissions in the agriculture sector in 2023 changed significantly compared to 1990. Emissions from Enteric Fermentation increased by 7.5 percentage points; emissions from Direct N2O Emissions from Managed Soils declined by 13.8 percentage points; emissions from Manure Management rose by 3.8 percentage points; emissions from Indirect N2O Emissions from Managed Soils decreased by 1.6 percentage points; and emissions from Indirect N2O Emissions from Manure Management increased by 2.3 percentage points (see Figure 2.27).




[179] Ministry of Natural Resources, Ecology and Technical Supervision of the Kyrgyz Republic. 2025. National Inventory Document for 1990–2023.

*Figure 2.27. Greenhouse gas emissions in the agriculture sector by source in 1990 and 2023.*[180]

The subcategories Enteric Fermentation and Direct N2O Emissions from Managed Soils are among the key national categories of GHG emissions in the Kyrgyz Republic.

### *2.1.6.4 Land Use, Land-Use Change and Forestry*

The Kyrgyz Republic is classified as a low-forest-cover country, with forests mainly represented by mountain ecosystems that are diverse and rich in valuable tree species. Approximately 90% of forests in the Kyrgyz Republic are located at altitudes ranging from 700 to 3,500 meters above sea level.

Most forests are situated on lands of the State Forest Fund and within protected natural areas. These lands consist of forested areas, which include forest stands, and non-forested areas, which form a single natural complex with forests, as well as agricultural and other land uses. Forests occupy 6.4% of the country's territory, and their preservation is a national priority for sustainable development. The majority of forests are managed by state forest enterprises. According to the 2023 Forest Fund inventory, the total forest area amounts to 1,273.1 thousand hectares.

Forests of the Republic are largely located in close proximity to settlements. More than 2 million rural residents across 283 (62.5%) ayil aimaks (rural districts) live near or directly within the territory of the State Forest Fund, with their social development being significantly dependent on forest resources (see Figure 2.28).

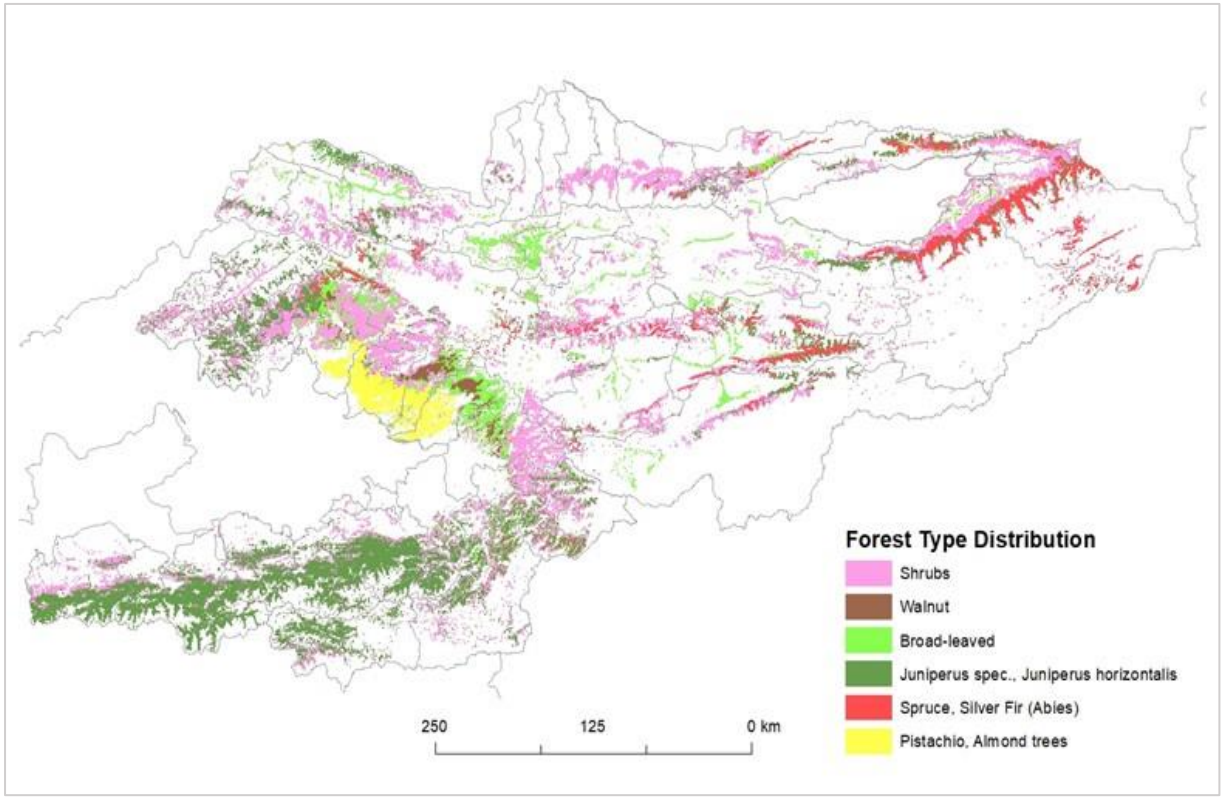



*Figure 2.28. Forests of the Kyrgyz Republic.*[181]

Forest legislation in the Kyrgyz Republic is governed by the Forest Code of the Kyrgyz Republic (adopted on 8 July 1999, No. 66). This Code establishes the legal framework for the rational

[180] Ministry of Natural Resources, Ecology and Technical Supervision of the Kyrgyz Republic. 2025. National Inventory Document for 1990–2023.

[181] CAREC – Regional Environmental Centre for Central Asia website:: https://carececo.org/main/news/2-ya-natsional-naya-inventarizatsiya-lesov-v-kyrgyzstane-itogi/

use, conservation, protection, and reproduction of forests, as well as for enhancing their ecological and resource potential.

The key provisions of the Forest Code include:

- Forest protection: measures to prevent illegal logging and safeguard forest ecosystems.
- Forest use: rules regulating the utilization of forest resources, including timber harvesting.
- Forest regeneration: programmes for reforestation and tree planting.
- State management: responsibilities of forest enterprises and public authorities in the forestry sector.

The main policy document is the Concept for the Development of the Forestry Sector of the Kyrgyz Republic until 2040, which sets the goal of achieving sustainable forest management to ensure economic prosperity, social well-being, ecological security, and a favourable environment for the citizens of the Kyrgyz Republic.

To achieve this objective, priorities have been defined that ensure the sustainability of the forestry sector, reflecting all components of sustainable development — economic, social, and environmental.

The economic priority aims to increase the forestry sector's contribution to GDP to 1% by 2040. The social priority is to reduce poverty among rural populations living near or within the State Forest Fund by 10% by 2040.

The environmental priority focuses on enhancing the climate-regulating and water-regulating functions of forests by preserving existing forests and increasing the forest cover of the country to 6% by 2040.

Institutionally, the forestry sector falls under the mandate of the Forest Service under the Ministry of Emergency Situations of the Kyrgyz Republic. Forest inventory and management planning are carried out by the State Institution "KyrgyzLesoOkhotoUstroistvo," which also operates under the Ministry of Emergency Situations.

#### *2.1.6.4.1 Emissions and Removals in the LULUCF Sector*

The Land Use, Land-Use Change and Forestry sector in the Kyrgyz Republic has been a net greenhouse gas (GHG) sink and has continuously absorbed carbon dioxide ($CO_2$) throughout the historical period, starting from the 1990 baseline year. The dynamics of GHG removals in the LULUCF sector reflect the natural growth of biomass in both natural and anthropogenic ecosystems.
With regard to the overall dynamics, in 2023 total removals in the LULUCF sector increased by 6.8% compared to 1990 and by 0.9% relative to 2017, amounting to 10,309.203 kt $CO_2$.[182]

In 2023, $CO_2$ removals in the category Forest land remaining forest land amounted to 8,213.658 kt $CO_2$, representing 79.7% of total removals in the Kyrgyz Republic, which is 5.5% higher than in 1990. Removals in the category Cropland remaining cropland accounted for 17.1% of total removals, or 1,767.181 kt $CO_2$. Removals in the category Grassland remaining grassland in 2023 totalled 328.365 kt $CO_2$, or 3.2% of the national total. [183]

In 1990, the LULUCF sector offset 34.6% of national GHG emissions, while in 2023 this share increased to 53.2%.

[182] Ministry of Natural Resources, Ecology and Technical Supervision of the Kyrgyz Republic. 2025. National Inventory Document for 1990–2023..
[183] Ibid.

The dynamics of GHG removals in the LULUCF sector by land-use categories over the period 1990–2023 are presented in Figure 2.29.

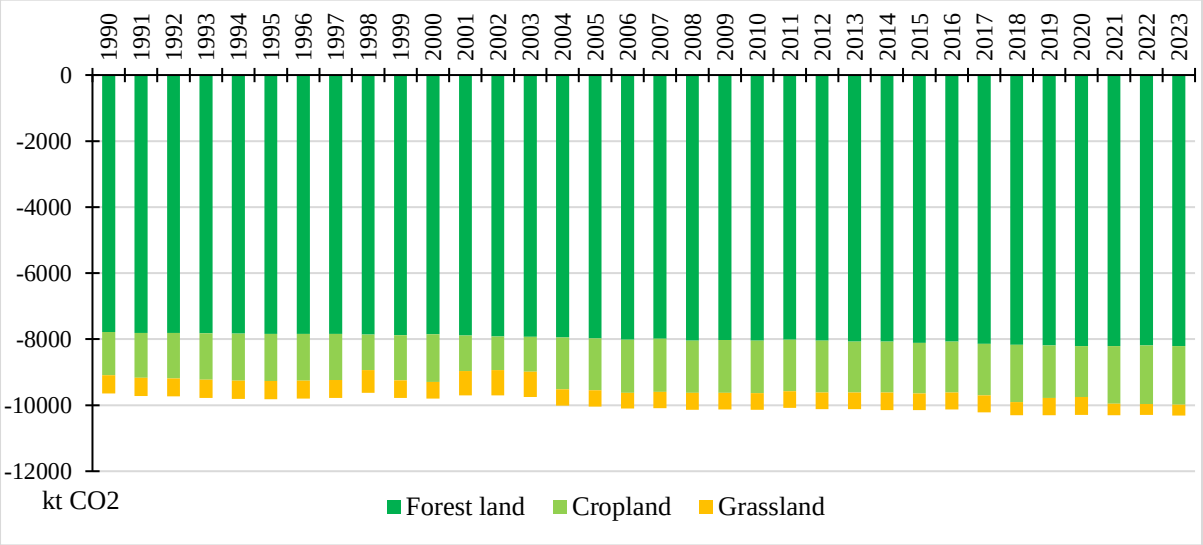



*Figure 2.29. Dynamics of Removals in the LULUCF Sector by Land-Use Categories, 1990–2023.*[184]

Emissions in the LULUCF sector, which were possible to assess within the National GHG Inventory for 1990–2023, originated primarily from natural forest fires. Data on other emission sources within this sector are not available for the Kyrgyz Republic.

These emissions included methane ($CH_4$) and nitrous oxide ($N_2O$); however, their volumes are insignificant and depend on the extent of forest areas affected by fires. The dynamics of GHG emissions in the sector for the period 1990–2023 are shown in Figure 2.30.

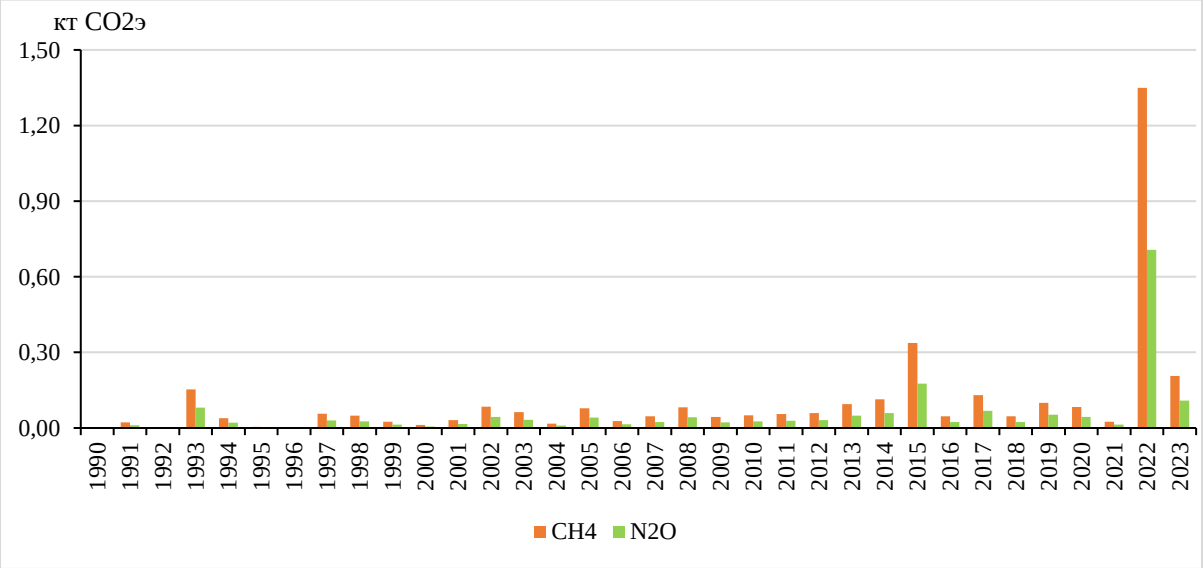



*Figure 2.30. Dynamics of Emissions in the LULUCF Sector, 1990–2023.*[185]

Emissions and removals of greenhouse gases by major source categories in 1990 and 2023, including the LULUCF sector, are presented in Figure 2.30.

[184] Ministry of Natural Resources, Ecology and Technical Supervision of the Kyrgyz Republic. 2025. National Inventory Document for 1990–2023..
[185] Ministry of Natural Resources, Ecology and Technical Supervision of the Kyrgyz Republic. 2025. National Inventory Document for 1990–2023.

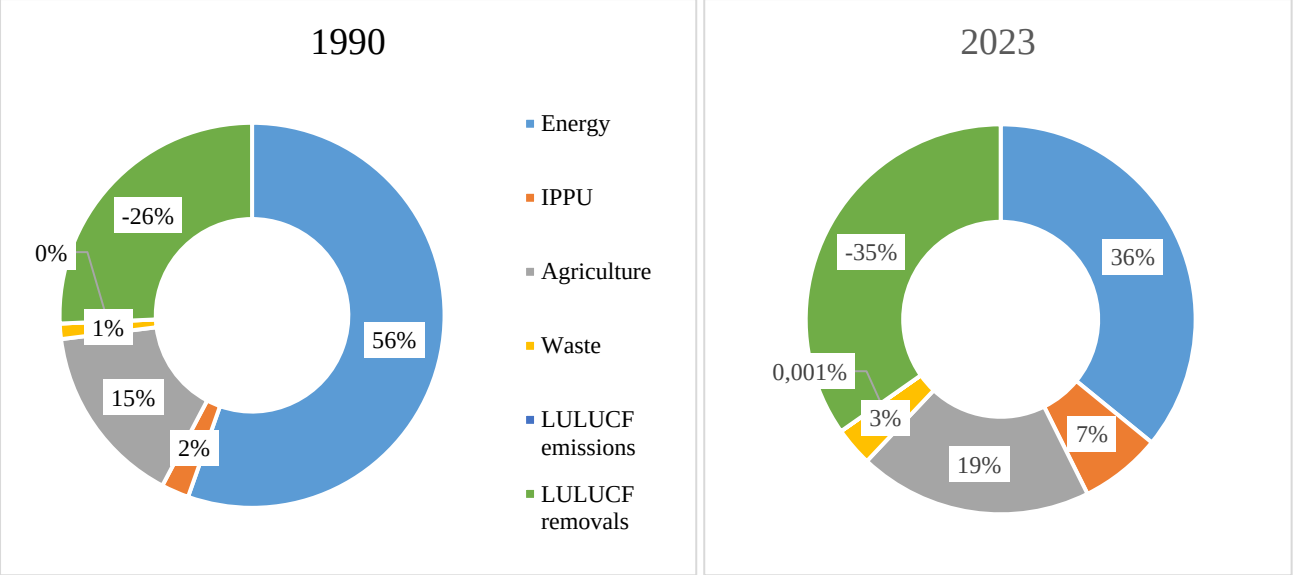



*Figure 2.31. GHG Emissions and Removals, Including LULUCF, by Source Categories in 1990 and 2023.*[186]

The categories *Forest land remaining forest land* and *Cropland remaining cropland* are among the key source categories of GHG emissions for the Kyrgyz Republic.

### *2.1.6.5 Waste*

In recent years, the Kyrgyz Republic has strengthened control over the environmental and technical safety of industrial and municipal waste. Nevertheless, the country has accumulated approximately 100 million tons of production and consumption waste, distributed across 35 tailing dumps and 25 waste rock deposits. According to UNCRD estimates,[187], about 1,000 tons of municipal solid waste (MSW) are collected daily in Bishkek alone, with an annual increase of around 20%. As the main economic center of the country, Bishkek faces numerous challenges related to solid waste management. Since 1989, the city's population has doubled. Rapid urbanization, the expansion of residential areas, and economic development—largely in the informal/shadow economy—have also placed additional pressure on urban infrastructure, including waste management systems.

The waste management system in the Kyrgyz Republic is developing but continues to face a number of challenges. The principle of Enhanced Producer Responsibility (EPR) has been introduced, obligating producers and importers of goods to pay a recycling fee. These funds are directed toward the development of infrastructure for the collection, sorting, and recycling of waste, as well as for the construction of waste processing plants.

Furthermore, a comprehensive analysis of the MSW management system has been undertaken. In Bishkek, about 1,000 tons of MSW are collected daily, 40–50% of which consists of packaging waste. However, existing landfills do not meet environmental standards and themselves become sources of pollution.

[186] Ministry of Natural Resources, Ecology and Technical Supervision of the Kyrgyz Republic. 2025. National Inventory Document for 1990–2023.

[187] UNCRD (United Nations Centre for Regional Development) is the United Nations Centre for Regional Development, established in 1971 on the basis of an agreement between the United Nations and the Government of Japan. Its objective is to promote sustainable regional development in developing countries, particularly in the areas of planning and development management under conditions of globalization and decentralization. UNCRD engages in training, research, and advisory services in the field of regional development. It also supports initiatives aimed at sustainable urban management and knowledge exchange among countries.

In accordance with the new edition of the Law of the Kyrgyz Republic "On Production and Consumption Waste", the Ministry of Natural Resources, Ecology and Technical Supervision[188], is implementing the principle of Extended Producer Responsibility.

EPR is a core principle of the circular economy aimed at achieving sustainable waste management. It establishes the responsibility of producers and importers of goods and packaging to pay a recycling fee.

The fee is applied to a specified list of goods and packaging materials that generate hazardous or problematic waste after the end of their consumer lifecycle. It is calculated by multiplying the mass of the product and/or its packaging by the recycling fee rate and the waste recycling standard. The list of goods is approved by the Cabinet of Ministers of the Kyrgyz Republic and includes plastic products, lubricants, batteries (including lead-acid and those for electric vehicles), motor vehicles, electronics and household appliances, machine filters, and packaging made of composite materials such as cardboard, rubber, and polymers.

The key coefficient for determining the recycling fee is the recycling fee rate, which is calculated based on a detailed cost analysis of average expenses for the collection, transportation, and recycling of specific items. This ensures fairness, as the amount of the fee varies depending on the relative complexity and costs of recycling different types of goods and packaging. The procedure for the payment of the recycling fee is currently being developed by the Ministry of Natural Resources, Ecology and Technical Supervision and is expected to be adopted by the end of the year.

Revenues from these payments are directed toward the comprehensive development of the national waste management system, from collection, logistics, sorting, and storage, to the introduction of zero-waste technologies and recycling. This includes the construction of waste processing plants, the recovery of secondary raw materials and their conversion into new products, as well as the generation of thermal and electrical energy.

The primary objective of the "polluter pays" principle is to stimulate ecological entrepreneurship by converting waste into marketable products and freeing large areas of agricultural and pasture land from uncontrolled dumpsites for targeted use, thereby improving the environmental quality and aesthetic value of the natural landscape.

At the community level, local self-government bodies—represented by village administrations and city municipalities—are responsible for organizing municipal waste management systems within their jurisdictions. They are tasked with approving rules for waste collection and removal and ensuring public awareness regarding waste management practices. In urban areas, relevant municipal enterprises and organizations have been established to perform these functions.

#### *2.1.6.5.1 Emissions from the Waste Sector*

Greenhouse gas emissions from the waste sector, when considered from the 1990 baseline, do not demonstrate a close correlation with the economic decline that Kyrgyzstan experienced following the collapse of the Soviet Union, when economic and integration ties, as well as production and supply chains, were disrupted. The independent Kyrgyz Republic had to undergo a severe economic downturn and declining living standards, followed by recovery and a gradual return to a sustainable development path.

The dynamics of GHG emissions from the waste sector reflect these changes to a lesser extent and are more strongly influenced by trends in consumption, the generation of municipal and industrial waste, wastewater, and population growth.

[188] Resolution No. 181 of 15 August 2023.

With regard to the dynamics of total GHG emissions, in 2000 compared to 1990 emissions from the waste sector decreased by 4.4%, amounting to 464.770 kt $CO_2$ eq compared to 486.040 kt $CO_2$ eq in 1990. Between 2000 and 2017, emissions from the sector increased by 50.1%, reaching 697.547 kt $CO_2$ eq. In 2023, emissions from the sector increased by 37.6% compared to the 2017 NDC baseline and reached 959.804 kt $CO_2$ eq, accounting for 5% of total national emissions of the Kyrgyz Republic.[189].

The waste sector generates emissions of two direct greenhouse gases: methane ($CH_4$) and nitrous oxide ($N_2O$).

In 2023, emissions from the waste sector by gas were as follows: $CH_4$ – 881.854 kt $CO_2$ eq, and $N_2O$ – 77.950 kt $CO_2$ eq. These values represent a substantial increase in methane emissions since 1990. Specifically, methane emissions in 2023 were 106.4% higher than in 1990, while nitrous oxide emissions decreased by 32.7%. [190]

The dynamics of GHG emissions from the waste sector by gas type over the period 1990–2023 are shown in Figure 2.32.

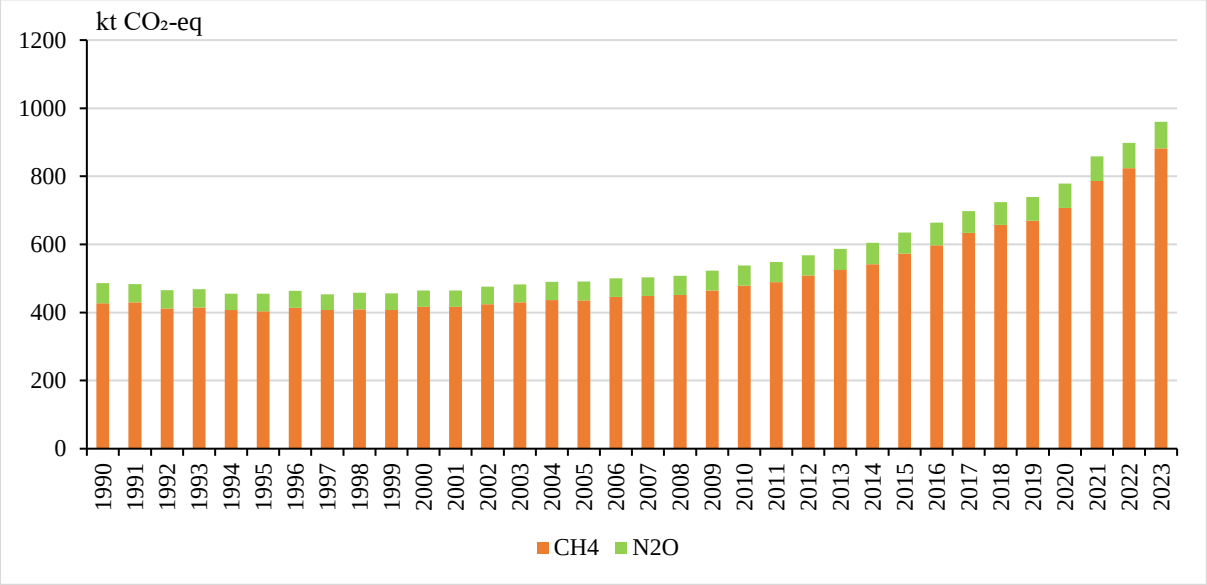



*Figure 2.32. Dynamics of GHG Emissions in the Waste Sector by Gas Type, 1990–2023*[191]

In 2023, total emissions from the waste sector increased by 97.5% compared to 1990, and the sector's share in national emissions rose from 2% to 5%.[192] .

The dynamics of sectoral emissions by source categories over the period 1990–2023 demonstrate a general upward trend starting in 2005 (Figure 2.33).

[189] Ministry of Natural Resources, Ecology and Technical Supervision of the Kyrgyz Republic. 2025. National Inventory Document for 1990–2023.
[190] Ibid.
[191] Ibid.
[192] Ibid.

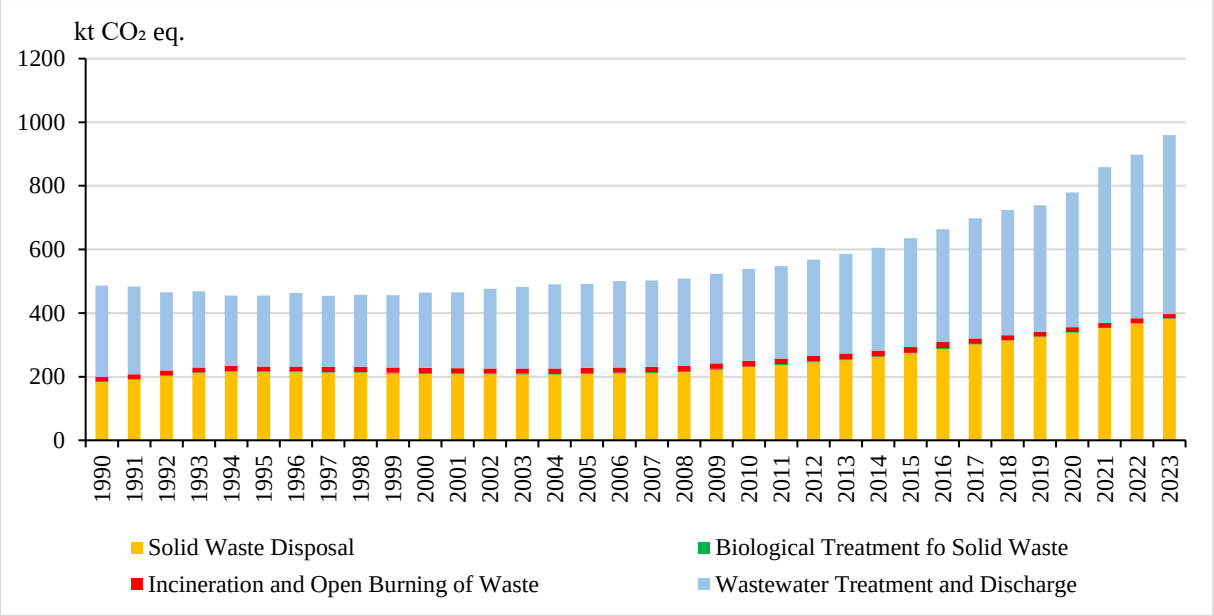



*Figure 2.33. GHG Emissions in the Waste Sector by Source Categories, 1990–2023*

Compared to 1990, in 2023 emissions in the category Solid Waste Disposal increased by 109.8%, while emissions in the category Wastewater Treatment and Discharge increased by 96.5%. Conversely, emissions from Biological Treatment of Solid Waste decreased by 18.8% relative to 1990, and emissions from Incineration and Open Burning of Waste decreased by 14.4%.[193]

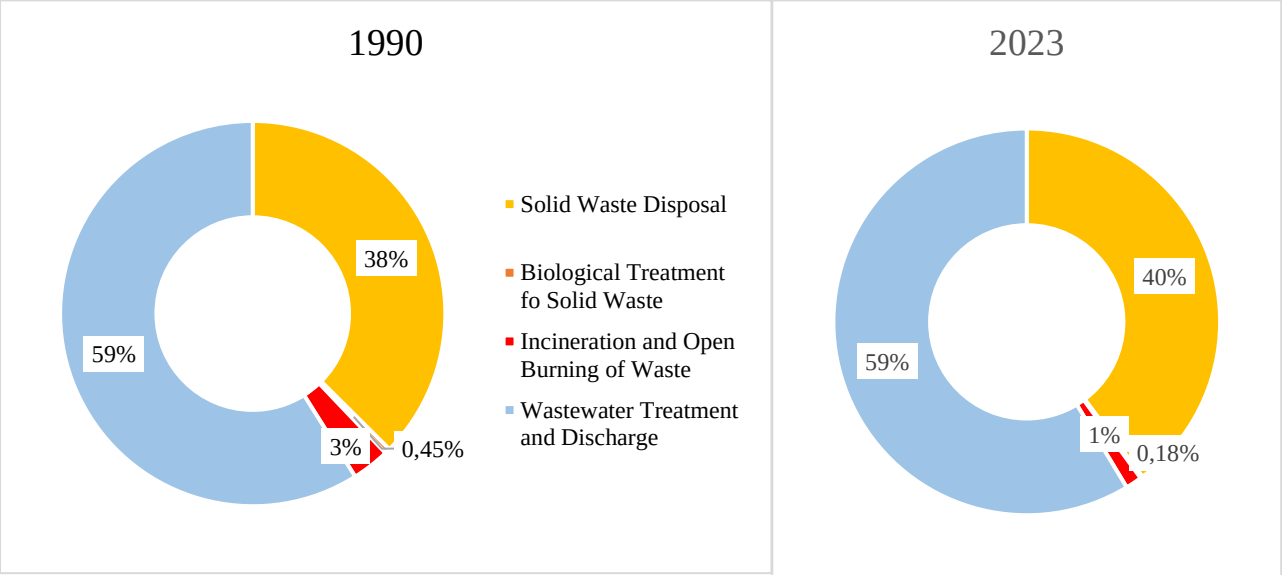



*Figure 2.34. GHG Emissions in the Waste Sector by Sources, 1990 and 2023*[194]

The subcategories Wastewater Treatment and Discharge and Solid Waste Disposal are among the country's key categories of GHG emission sources in the Kyrgyz Republic.

## 2.1.7 Institutional Arrangements for NDC Progress Tracking

[193] Ministry of Natural Resources, Ecology and Technical Supervision of the Kyrgyz Republic. 2025. National Inventory Document for 1990–2023.
[194] Ministry of Natural Resources, Ecology and Technical Supervision of the Kyrgyz Republic. 2025. National Inventory Document for 1990–2023.

In accordance with paragraph 61 of the MPGs, this section provides information on the institutional arrangements in place for tracking progress made in the implementation and achievement of the Nationally Determined Contribution under Article 4.

### *2.1.7.1 Institutional Arrangements for Climate Change Mitigation*

There is no separate mechanism for tracking progress towards the achievement of NDC targets in the Kyrgyz Republic. Issues related to monitoring progress in the implementation of the country's NDC commitments are addressed alongside other aspects of the national climate agenda, usually with the support of various international development partners' projects.

In 2023, with the support of UNDP, the Kyrgyz Republic developed an NDC Implementation Plan. The current monitoring system is based on a set of indicators, timelines, responsible institutions, and indicative budgets included in this document. In summary form, the roles of different actors responsible for NDC-related actions are presented in Table 2.10.

*Table 2.10.Implementing Entities for NDC Policies and Measures and Their Roles in Tracking NDC Progress*

| № | Institution | Role in Tracking NDC Progress |
|---|---|---|
| 1. | Coordinating Council on Climate Change, Environment, and Sustainable Development | 1) Coordinates the creation of synergies among ministries and agencies for climate action and NDC implementation.<br>2) Approves the NDC and climate reporting documents on progress in its implementation. |
| 2. | Ministry of Natural Resources, Ecology, and Technical Supervision | 1) Develops and implements national climate policy and legislation for NDC implementation.<br>2) Coordinates implementation and collects information for monitoring NDC progress.<br>3) Prepares climate reports on NDC progress.<br>4) Develops and introduces the national MRV system.<br>5) Collects and archives all information related to NDC implementation.<br>6) Implements NDC mitigation measures in the waste sector and adaptation measures in ecosystems and biodiversity. |
| 3. | Aarhus Center in Bishkek | 1) Compilation of the GHG inventory by gases and sources, recalculation of emissions in $CO_2$-eq.<br>2) Projection of future GHG emissions by scenarios.<br>3) Calculation of GHG emission reductions from implemented and planned NDC measures.<br>4) Preparation of reports on NDC progress.<br>5) Development of the information base for NDC 3.0. |
| 4. | Ministry of Energy and its subdivisions | 1) Executor and coordinator of mitigation and adaptation measures in the energy sector.<br>2) Provider of information on achieving NDC implementation plan indicators for mitigation and adaptation.<br>3) Participant in ensuring the quality of NDC progress reporting. |
| 5. | Ministry of Transport and Communications | 1) Executor and coordinator of mitigation and adaptation measures across all types of transport.<br>2) Provider of information on achieving NDC implementation plan indicators.<br>3) Participant in ensuring the quality of NDC progress reporting. |
| 6. | Ministry of Economy and Commerce | 1) Executor and coordinator of mitigation measures in the industrial sector.<br>2) Provider of information on achieving NDC implementation plan indicators.<br>3) Participant in ensuring the quality of NDC progress reporting. |
| 7. | Ministry of Water Resources, Agriculture, and Processing Industry | 1) Executor and coordinator of mitigation and adaptation measures in agriculture, water resources, and processing industry. |

| № | Institution | Role in Tracking NDC Progress |
|---|---|---|
| | | 2) Provider of information on achieving NDC implementation plan indicators.<br>3) Participant in ensuring the quality of NDC progress reporting. |
| 8. | Ministry of Emergency Situations | 1) Executor and coordinator of mitigation measures in forestry and adaptation measures in disaster risk management.<br>2) Provider of information on achieving NDC implementation plan indicators.<br>3) Participant in ensuring the quality of NDC progress reporting. |
| 9. | Municipalities of Bishkek and Osh, and their municipal enterprises | 1) Executors and coordinators of mitigation measures in solid waste and wastewater management, and urban adaptation measures.<br>2) Providers of information on achieving NDC implementation plan indicators.<br>3) Participants in ensuring the quality of NDC progress reporting. |
| 10. | National Statistics Committee | 1) Provider of cross-sectoral data across all sectors.<br>2) Participant in ensuring the quality of NDC progress reporting. |
| 11. | State Customs Service under the Ministry of Finance | 1) Provider of data on imports of energy products and equipment containing F-gases.<br>2) Responsible for reducing and phasing out imports of HFCs. |
| 12. | State Agency for Architecture, Construction, and Housing and Communal Services | 1) Executor and coordinator of mitigation measures in energy-efficient construction and urban infrastructure adaptation.<br>2) Provider of information on achieving NDC implementation plan indicators.<br>3) Participant in ensuring the quality of NDC progress reporting. |
| 13. | Private Enterprises | 1) Executors of mitigation measures under the NDC Implementation Plan.<br>2) Providers of information on achieving NDC implementation plan indicators.<br>3) Participants in ensuring the quality of NDC progress reporting. |
| 14. | Research Institutes and Universities | 1) Executors of mitigation and adaptation measures under the NDC Implementation Plan.<br>2) Providers of information on achieving NDC implementation plan indicators.<br>3) Participants in ensuring the quality of NDC progress reporting. |

## 2.2 Description of the Party's Nationally Determined Contribution under Article 4 of the Paris Agreement, including updates

In accordance with paragraph 64 of the MPGs, this section presents information on the NDC in line with Article 4 of the Paris Agreement.

Pursuant to the provisions of the Paris Agreement, the Kyrgyz Republic submitted its first NDC in 2015 and updated it in 2021, setting an ambitious unconditional target to reduce its net GHG emissions by 16.63% below the business-as-usual (BAU) scenario level by 2025 and by 15.97% below BAU by 2030. Subject to the availability of international support (financial, technological, and capacity-building), net GHG emissions were envisaged to be reduced by 36.61% below BAU in 2025 and 43.62% below BAU in 2030, with sector-specific targets (see Tables 2.11 and 2.12).

The Common Tabular Formats adopted under Decision 5/CMA.3, reporting on the tracking of NDC implementation, are annexed to this BTR1.

Furthermore, in accordance with paragraph 11 of Article 7 of the Paris Agreement and paragraph 11 of Decision 9/CMA.1, the adaptation priorities set out in the updated NDC of the Kyrgyz Republic are consistent with subparagraph (c) of the Annex to Decision 9/CMA.1 ("Further guidance in relation to

the adaptation communication, including, inter alia, as a component of an NDC under Article 7, paragraphs 10 and 11 of the Paris Agreement and the Law of the Kyrgyz Republic on its ratification"[195]).

Accordingly, the adaptation priorities of the updated NDC form part of the Kyrgyz Republic's adaptation reporting under paragraph 10 of Article 7 of the Paris Agreement. The updated NDC is publicly available on the UNFCCC website.

### *Updated Nationally Determined Contribution of the Kyrgyz Republic*

The updated Nationally Determined Contribution of the Kyrgyz Republic was prepared in accordance with the decisions of the Conference of the Parties to the UNFCCC and the Paris Agreement, including Decision 1/CP.21; Decision 4/CMA.1; Decision 9/CMA.1; and Decision 18/CMA.1.

The NDC was developed under the overall coordination of the then State Committee on Ecology and Climate (now the Ministry of Natural Resources, Ecology and Technical Supervision of the Kyrgyz Republic), applying a comprehensive government-wide approach, and was approved by a resolution of the Coordinating Council on Climate Change, Environment, and Green Economy Development, chaired by the Chairman of the Cabinet of Ministers of the Kyrgyz Republic, on 27 September 2021.

The development of the updated NDC was supported by the United Nations Development Programme in the Kyrgyz Republic under the global initiative Climate Promise and the NDC Partnership, and was carried out with the participation of an inter-agency working group, experts, and representatives of the scientific and civil society communities, as well as the private sector and youth, ensuring an open process of consultations on national commitments.

During the preparation of the updated NDC, a number of international development partners contributed at different stages, including IEA, GIZ, EBRD, the Government of the United Kingdom, the European Union, UNITAR, UNICEF, FAO, IFAD, as well as other UN agencies and international development partners.

The updated NDC represents the Kyrgyz Republic's plan to address climate change and its contribution to global efforts to reduce greenhouse gas emissions. It sets the direction for a low-carbon transformation up to 2030, taking into account national priorities and the Sustainable Development Goals. A description of the updated NDC is presented in Table 2.11.

*Table 2.11. Reporting format for the description of the Party's NDC under Article 4 of the Paris Agreement, including updates (Introductory/Appendix information).*

| | ***Description*** |
|---|---|
| Target(s) and description, including target type(s), as applicable[b, c] | Unconditional target of Kyrgyzstan NDC is to reduce BAU scenario net GHG emissions by 16.63% in 2025 and by 15.97% in 2030. Under condition of the adequate international support Kyrgyzstan assumes to reduce BAU scenario net GHG emissions by 36.61% in 2025 and by 43.62% in 2030. |
| Target year(s) or period(s), and whether they are single-year or multi-year target(s), as applicable | The target years are 2025 and 2030, both of which represent single-year targets. |
| Reference point(s), level(s), baseline(s), base year(s) or starting point(s), and their respective value(s), as applicable | The reference point is the BAU scenario for 2025, which is 11,828.13 kt CO2eq. and for 2030, which is 17,778.10 kt CO2eq. |
| Time frame(s) and/or periods for implementation, as applicable | NDC covers time frame and period of implementation from 2021 to 2025 and 2030 |

[195] Law of the Kyrgyz Republic "On the Ratification of the Paris Agreement under the United Nations Framework Convention on Climate Change, signed on 12 December 2015 in Paris" dated 11 November 2019, No. 125.

| | *Description* |
|---|---|
| Scope and coverage, including, as relevant, sectors, categories, activities, sources and sinks, pools and gases, as applicable | The target corresponds to a reduction in economy-wide net GHG emissions compared to projected baseline year emissions. Gases covered: Carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCs). Sectors covered: Energy; Industrial Processes and Product Use (IPPU); Agriculture; Land Use, Land-Use Change and Forestry (LULUCF), Waste. |
| Intention to use cooperative approaches that involve the use of ITMOs under Article 6 towards NDCs under Article 4 of the Paris Agreement, as applicable | Kyrgyzstan plans to achieve its unconditional target of economywide emission reduction using domestic measures. It may engage in Article 6 mechanisms under the Paris Agreement and needs climate finance for the conditional part of its NDC. |
| Any updates or clarifications of previously reported information, as applicable[d] | Wihin national GHG inventory for 1990-2023 recalculations were conducted in accordance of IPCC AR 5 GWP values. As a result, new values of the net GHG emission in 2017 amounted to 6,239.06 kt CO2eq. Net emissions in 2023 are 9,065.27 kt CO2eq. The updated projecttions values of the reference point for 2025 is 11,828.13 kt CO2eq. and for 2030 is 17,778.10 kt CO2eq. |

In 2023, to accelerate climate action through an inclusive process, an NDC Implementation Plan was developed. It included more than 200 adaptation and mitigation measures and identified the financing needs for the NDC.

The updated NDC contains, in particular, the following information intended to facilitate clarity, transparency, and understanding of the nationally determined contributions.

## 2.3 Information necessary for tracking progress in the implementation and achievement of the nationally determined contribution under Article 4 of the Paris Agreement

### 2.3.1 Description of the indicator for tracking progress in the implementation and achievement of the NDC

The main indicator for tracking progress in achieving the targets of the Nationally Determined Contribution is “net emissions”, in line with the Intergovernmental Panel on Climate Change reporting guidelines. This indicator directly measures the volume of greenhouse gas emissions released into the atmosphere, taking into account removals, and provides a quantitative metric for assessing the efforts of the Kyrgyz Republic to reduce its climate impact.

By selecting a target percentage reduction in 2025 and 2030 compared to the baseline emissions trajectory under the no-action scenario, the “net GHG emissions” metric allows for monitoring of national emissions trends. This ensures transparency in tracking progress and compliance with the Kyrgyz Republic's Nationally Determined Contribution commitments under the Paris Agreement.

In addition, this indicator is consistent with IPCC methodology, in which net GHG emissions serve as a benchmark for determining the extent to which a country meets its climate mitigation targets under the United Nations Framework Convention on Climate Change.

Since the target indicator for reducing net emissions in the Kyrgyz Republic is expressed as a percentage relative to the baseline, the use of net GHG emissions as the tracking metric allows for comparison of results over time.

This enables the Kyrgyz Republic to assess whether its climate policy and emission reduction measures in key sectors, including energy, industry, agriculture, and waste, are effective and whether the country is on the right trajectory to achieve its NDC target by 2030.

The Kyrgyz Republic has prepared, communicated, and maintained its NDC, the targets of which it intends to achieve by implementing mitigation measures in the form of a relative economy-wide emissions reduction target compared to the baseline emissions trajectory under the business-as-usual or "with no measures" scenario. The target covers all sectors, categories, activities, sources, and sinks included in the national greenhouse gas inventory. Therefore, the Kyrgyz Republic has chosen net GHG emissions under the BAU scenario as the single most important and relevant indicator for tracking progress and achieving its NDC.

### 2.3.2 Tracking progress in the implementation and achievement of the NDC

In 2021, at the time of preparing the Second Nationally Determined Contribution (NDC 2), based on the National Greenhouse Gas Inventory for 1990–2017 presented in the First Biennial Update Report, net greenhouse gas emissions in the base year 1990 amounted to 18,027.241 kt $CO_2$ equivalent ($CO_2$ eq.), and in 2017 to 5,500.727 kt $CO_2$ eq.

The projection of total and net emissions for the period 2017–2030, as presented in NDC 2, is shown in Figure 2.35.

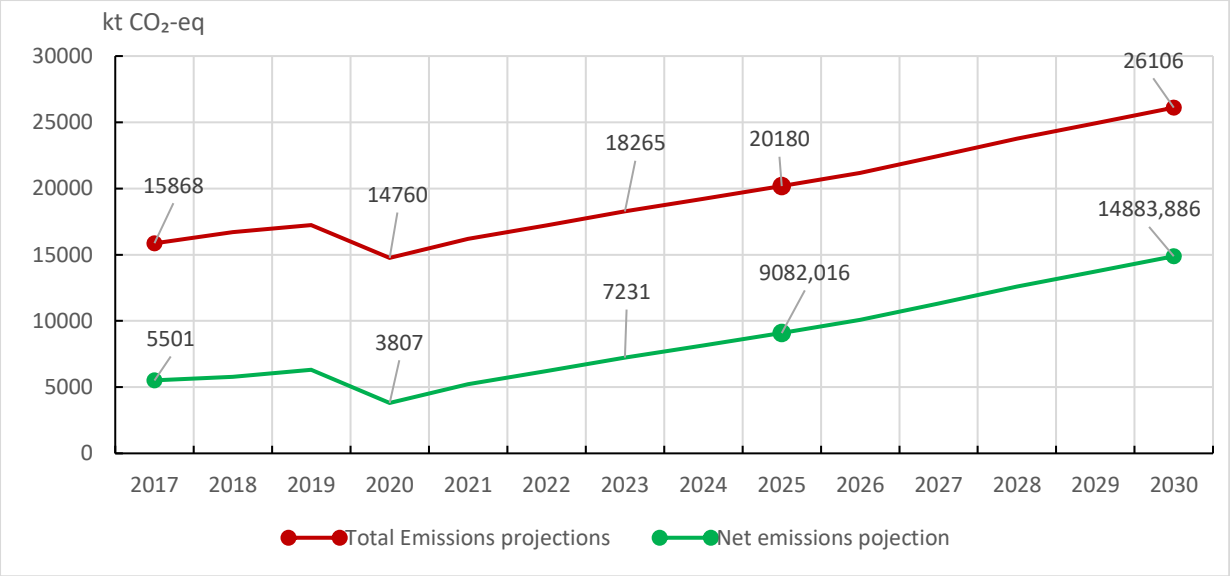



*Figure 2.35. Projection of total and net GHG emissions for the period 2017–2030*

At the same time, it should be noted that after the recalculation of the 1990–2023 time series, carried out in 2025 within the framework of the NGHGI 1990–2023 using the new Global Warming Potential values from the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, different annual values of net emissions were obtained. The comparison of these GHG emission values for 1990 and 2017, as well as the difference between the projections based on these data and the values obtained from the NGHGI 1990–2023, is presented in Table 2.12.

The baseline values for all years from 2021 to 2030 of the updated projection of net emissions are provided in Section 2.6 of Chapter 2 below.

*Table 2.12. Comparison of NGHGI 1990–2017 data and emission projections based on these data with the results of NGHGI 1990–2023*

| Year | NGHGI 990–2017, kt $CO_2$ eq. | Projection values used in NDC 2 | NGHGI 1990–2023, kt $CO_2$ eq. | Difference in percent |
|---|---|---|---|---|
| **1990** | 18 027,24 | | 18 259,00 | 1,3 |
| **2017** | 5 500,73 | | 6 239,06 | 13,4 |
| **2018** | | 5 777,15 | 8 030,10 | 39,0 |
| **2019** | | 6 313,60 | 6 283,03 | -0,5 |
| **2020** | | 3 807,21 | 6 534,14 | 71,6 |
| **2021** | | 5 232,96 | 8 458,70 | 61,6 |
| **2022** | | 6 218,04 | 8 782,23 | 41,2 |
| **2023** | | 7 231,26 | 9 065,27 | 25,4 |
| **2025** | | 9 082,02 | | |
| **2030** | | 14 883,89 | | |

Information on the selected indicators for tracking NDC progress is presented in Table 2.13.

*Table 2.13. Information on selected indicators for tracking NDC progress (CTF Table 1)*

| ***Indicator(s) selected to track progress***[a] | ***Description*** |
|---|---|
| Total annual net GHG emissions | Total annual net GHG emissions consistent with the scope and coverage of the NDC expressed in in CO2e and resulting percentage reduction below BAU levels. |
| Information for the reference point(s), level(s), baseline(s), base year(s) or starting point(s), as appropriate[b] | The reference points for NDC of Kyrrgyzsan are the levels of the net GHG emissions as per BAU in 2025 - 11,828.131 kt CO2e and in 2030 - 17,778.094 kt CO2e and resulting percentage reduction below BAU levels. |
| Updates in accordance with any recalculation of the GHG inventory, as appropriate[b] | The level of the net GHG emissions of Kyrgyzstan for the starting point in 2017 was recalculated from 5,477.467 kt CO2e to 6,239.06 kt CO2e in accordance with the 2025 GHG inventory submitted in conjunction with the BTR 1.<br>Accordingly, the BAU net emission levels for 2025 and 2030 were recalculated from 9,082.016 kt CO2e to 11,828.131 kt CO2e and from 14,883.886 kt CO2e to 17,778.094 kt CO2e accordingly. |
| Relation to NDC[c] | The indicator that was selected to track progress to NDC by Kyrgyzstan is defined in the same unit and metric as the target of the NDC. Hence it can be used directly for tracking progress in implementing and achieving the NDC target without any further calculationas and adjustments. |

Thus, it can be stated that the main indicator of the Kyrgyz Republic in the “net emissions” metric is dynamic and will depend on the data of the National Greenhouse Gas Inventory, not only for assessing GHG emissions but also for constructing baseline emission projections, against which the volume of reductions will be measured.

Recalculation and development of the baseline emission projection up to 2030 are based on the results of the NGHGI 1990–2023 recalculation.

## 2.4 Policies and Measures for Climate Change Mitigation

The mitigation actions of the Kyrgyz Republic are embedded in a range of strategic development policy documents. The list of these policies is provided in Table CTF 5.

Table 2.14 below presents the policies and measures by sector in relation to the unconditional and conditional targets of the Second Nationally Determined Contribution (NDC 2).

*Table 2.14. Summary of the NDC of the Kyrgyz Republic, including mitigation policies and measures*

| **Mitigation policies and measures under the NDC targets** |
|---|
| **Unconditional targets for 2025 and 2030** |
| *Reduction of GHG emissions in the Energy sector*<br>• Expansion of the construction of energy-efficient buildings<br>• Reduction of coal consumption through gasification of households and boiler houses<br>• Expansion of hydropower generation capacity<br>• Reduction of electricity distribution losses<br>• Reduction of heat distribution losses<br>*Reduction of GHG emissions in the Transport sector*<br>• Improvement of road traffic management, public transport, and development of cycling infrastructure<br>*Reduction of GHG emissions in the Agriculture sector*<br>• Expansion of the area under organic farming<br>*Increase in removals in the Forestry sector*<br>• Conservation and enhancement of carbon sequestration in forests |
| **Conditional targets for 2025 and 2030** |
| *Reduction of GHG emissions in the Energy sector*<br>• Improvement of energy efficiency of existing buildings<br>• Expansion of generation from renewable energy sources<br>• Increase in the number of small hydropower plants<br>*Reduction of GHG emissions in the Transport sector*<br>• Development of electric transport<br>• Transition of public transport from gasoline and diesel to natural gas<br>• Improvement of vehicle operation and management systems<br>*Reduction of GHG emissions in the Industrial Processes and Product Use sector*<br>• Establishment of a regulatory framework for tracking products containing HFCs<br>*Reduction of GHG emissions in the Agriculture sector*<br>• Improvement of livestock breeding to reduce the growth of total herd numbers<br>*Increase in removals in the Forestry sector*<br>• Conservation and enhancement of carbon sequestration in perennial plantations<br>*Reduction of GHG emissions in the Waste sector*<br>• Expansion of separate collection of municipal solid waste |

The mitigation policies and measures presented in the description below represent the unconditional measures under the "With Measures" (WM) scenario, which the Kyrgyz Republic planned to implement at the time of submission of NDC 2 in 2021, and additional measures under the "With Additional Measures" (WAM) scenario, which the Kyrgyz Republic intends to implement subject to international support. For each sector, these measures are first presented in terms of institutional arrangements. Subsequently, the NDC policies and measures are presented in tables with corresponding codification of WM and WAM.

## 2.4.1. Energy

### *2.4.1.1 Institutional arrangements for the implementation of policies and measures*

The following Table 2.15 presents the unconditional mitigation policies and measures of the Second Nationally Determined Contribution of the Kyrgyz Republic and the institutions responsible for their implementation.

*Table 2.15. Policies and measures, and institutions responsible for implementation*

| № | Policies and Measures | Responsible Government Agencies and Partners |
|---|---|---|
| **Policy 1. Reduction of GHG emissions in the Energy sector** | | |
| **Unconditional measures (WM)** | | |
| ***Objective 1.1. Improving energy efficiency of buildings and households*** | | |
| **1.1.1.** | Construction of new multi-apartment buildings in compliance with energy-efficient Construction Norms and Regulations (SNiP) | State Agency for Architecture, Construction and Communal Utilities (GAAC&CU), construction companies |
| ***Objective 1.2. Reducing coal consumption through gasification of households and boiler houses*** | | |
| **1.2.1.** | Implementation of Gazprom Kyrgyzstan projects on household gasification | Ministry of Energy (MoE), Gazprom Kyrgyzstan |
| **Objective 1.3. Development of hydropower** | | |
| **1.3.1.** | Increasing the capacity of existing hydropower plants | MoE, OJSC "Electric Stations", investors |
| **1.3.2.** | Electricity generation at existing private small HPPs | MoE, investors |
| **1.3.2.** | Construction and commissioning of new small HPPs | MoE, investors |
| **1.3.4** | Reduction of losses in the National Electric Grids of Kyrgyzstan (NESK) | MoE, NESK |
| ***Objective 1.4. Reducing electricity distribution losses*** | | |
| **1.4.1.** | Reduction of electricity losses in NESK (former Severelektro) | MoE, NESK distribution companies |
| **1.4.2.** | Reduction of electricity losses in NESK (former Vostokelektro) | |
| **1.4.3.** | Reduction of electricity losses in NESK (former Oshenergo) | |
| **1.4.4.** | Reduction of electricity losses in NESK (former Jalal-Abadelektro) | |
| ***Objective 1.5. Improving district heating systems in Bishkek*** | | |
| **1.5.1** | Reduction of distribution losses | MoE, OJSC "Bishkekteploset" |
| ***Measures subject to international support (WAM)*** | | |
| ***Objective 1.1. Improving energy efficiency of buildings and households, with attention to vulnerable groups*** | | |
| **1.1.1.** | Scaling-up installation of energy-efficient stoves in households | MoE, donors |
| **1.1.2.** | Improving energy efficiency of small boiler houses through replacement of coal boilers with gas-fired ones | MoE, Gazprom Kyrgyzstan, World Bank |
| **1.1.3.** | Improving energy efficiency of existing buildings | MoE, municipalities, investors |
| **Objective 1.2. Development of renewable energy sources** | | |
| **1.2.1** | Installation and use of biogas units in agriculture[196] | MoE, investors |
| **1.2.2** | Installation of BGPPs at sanitary landfills in Bishkek and Osh | MoE, municipalities, investors |
| **1.2.3.** | Installation of BGPPs at wastewater treatment plants in Bishkek and Osh | MoE, municipalities, investors |
| **1.2.4** | Installation of BGPPs in the food industry | MoE, investors |
| **1.2.5.** | Expansion of solar thermal collectors for hot water supply | MoE, investors |
| **1.2.6.** | Development of solar power generation | MoE, investors, PVS project, LLC Bishkek Solar |
| **1.2.7** | Expansion of geothermal energy use (installation of heat pumps) | MoE, investors |
| **1.2.8** | Implementation of the wind power project of OJSC "Kyrgyz Wind Systems" for wind energy development | MoE, investors |
| ***Objective 1.3. Development of large hydropower*** | | |
| **1.3.2.** | Construction of new HPPs / Upper Naryn cascade (WAM) | MoE, investors |

[196] The development of biogas plant (BGP) utilization involves the potential of entities dealing with organic waste across all sectors, but it must be accounted for in reporting under the "Energy" sector within the general category "Fuel combustion" and is classified under the "With Additional Measures" scenario.

### *2.4.1.2. Unconditional mitigation policies and measures in the Energy sector*

Table 2.16 below presents 11 direct mitigation policies and measures identified in the NDC, which were planned for implementation under the "With Measures" (WM) scenario, as well as information on their implementation progress as of 2023. A description of the progress in the implementation of the measures listed in the table is provided after the table.

*Table 2.16. Unconditional mitigation policies and measures of the NDC in the Energy sector and GHG emission reductions under the WM scenario*

| № | Policies and Measures | Indicators | Target Values | Implementation Period (years) | Expected Reductions, kt $CO_2$ eq.[197] | Progress Assessment (2023) | |
|---|---|---|---|---|---|---|---|
| | | | | | | Activity Indicators | Mitigation Indicators, kt $CO_2$ eq. |
| ***Policy 1. Reduction of GHG emissions in the Energy sector*** | | | | | | | |
| ***Unconditional measures (WM)*** | | | | | | | |
| ***Objective 1.1. Improving energy efficiency of new buildings and households, taking into account the needs of vulnerable groups, including women*** | | | | | | | |
| **1.1.1.** | Construction of new multi-apartment buildings in compliance with energy-efficient Construction Norms and Regulations (SNiP) | Square meters of housing | 1,165.055 thousand m² annually | 2021–2030 | 2025 – 38.03; 2030 – 44.98 | 415.714 thousand m² | 12.58 |
| ***Objective 1.2. Reducing coal consumption through gasification of households and boiler houses*** | | | | | | | |
| **1.2.1.** | Implementation of Gazprom Kyrgyzstan projects on household gasification | % of household gasification nationwide | 2020 – 33%; 2025 – 44%; 2030 – 60% | 2021–2030 | 2025 – 810.85; 2030 – 1,135.19 | 38% | 341.41 |
| ***Objective 1.3. Development of hydropower*** | | | | | | | |
| **1.3.1.** | Increasing the capacity of existing hydropower plants (HPPs) | Installed capacity of existing HPPs | 360 MW | 2021–2030 | 2025 – 108.72; 2030 – 108.72 | 4 MW | 1.09 |
| **1.3.2.** | Electricity generation from existing private small HPPs | Total capacity of existing private small HPPs | 84.46 MW | 2021–2030 | 2025 – 22.96; 2030 – 22.96 | 8.7 MW | 5.02 |
| **1.3.3.** | Construction and commissioning of new small HPPs | Installed capacity of newly constructed and commissioned small HPPs | 100 MW | 2021–2030 | 2025 – 0; 2030 – 29.17 | NE | NE |
| **1.3.4** | Reduction of losses in the National Electric Grids of Kyrgyzstan | Annual electricity transmission losses | 4.7% | 2021–2030 | 2025 – 9.28; 2030 – 9.28 | 5.35% | 5.33 |
| ***Objective 1.4. Reducing electricity distribution losses*** | | | | | | | |
| **1.4.1.** | Reduction of electricity losses in NESK (former Severelektro) | Annual electricity distribution losses in NESK (former Severelektro) | 9–10% | 2021–2030 | 2025 – 10.76; 2030 – 17.00 | 10.29% | 10.45 |
| **1.4.2.** | Reduction of electricity losses in NESK (former Vostokelektro) | Annual electricity distribution losses in NESK (former Vostokelektro) | 9–10% | 2021–2030 | 2025 – 2.27; 2030 – 5.77 | 10.29% | 2.20 |

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| № | Policies and Measures | Indicators | Target Values | Implementation Period (years) | Expected Reductions, kt $CO_2$ eq.[197] | Progress Assessment (2023) | |
|---|---|---|---|---|---|---|---|
| | | | | | | Activity Indicators | Mitigation Indicators, kt $CO_2$ eq. |
| **1.4.3.** | Reduction of electricity losses in NESK (former Oshenergo) | Annual electricity distribution losses in NESK (former Oshenergo) | 9–10% | 2021–2030 | 2025 – 3.57; 2030 – 9.39 | 10.29% | 3.47 |
| **1.4.4.** | Reduction of electricity losses in NESK (former Jalal-Abadelektro) | Annual electricity distribution losses in NESK (former Jalal-Abadelektro) | 9–10% | 2021–2030 | 2025 – 2.93; 2030 – 5.91 | 10.29% | 2.85 |
| ***Objective 1.5. Improving district heating systems in Bishkek*** | | | | | | | |
| **1.5.1** | Modernization of district heating systems to improve energy efficiency | Reduction of electricity consumption in heating systems of Bishkek per year | 24–25% | 2021–2030 | 2025 – 3.75; 2030 – 3.75 | 25.7% | 3.09 |
| **1.5.2** | Modernization of heat supply networks to improve energy efficiency (WM) | Reduction of electricity consumption by pumping systems of the heating network | 33% | 2021–2030 | 2025 – 0.57; 2030 – 0.57 | 33% | 0.57 |

#### *2.4.1.2.1 Implementation of unconditional NDC policies and measures in the Energy sector*

In the Energy sector, under the updated NDC of 2021, the implementation of unconditional mitigation measures under the "With Measures" scenario was planned in the following main policy areas:

1.1. Improving energy efficiency of buildings and households, taking into account the needs of vulnerable groups
1.2. Reducing coal consumption through gasification of households and boiler houses
1.3. Development of hydropower
1.4. Reducing electricity distribution losses
1.5. Improving district heating systems in Bishkek

***Measure 1.1.1. Construction of new buildings in compliance with energy-efficient Construction Norms and Regulations (SNiP).***

Energy-efficient SNiPs require the use of modern insulation, ventilation, and heating systems in the construction of multi-apartment and other buildings, reducing energy consumption for heating to 110 kWh per year per square meter (class B – high energy efficiency). This in turn reduces GHG emissions by lowering the volume of fuel required for combustion for heating. As of 2023, 415.714 thousand m² were constructed under such SNiPs, with GHG emission reductions amounting to 12.58 kt $CO_2$ eq.

*GHG emissions reduction calculation.* To calculate emissions reduction the methodology of the projects on calculation of the energy supply and exploitation costs for new buildings was used, as well as the costs of energy-efficient removation masures for the old buildings using the following formula:

$$\mathbf{ER_{buildings} = AES \times EF}$$

Where:
**$ER_{buildings}$ – emission reduction in buildings**
AES – amount of energy savings

EF – $CO_2$emission factor - 0,0776 kt $CO_2$ eq.

**Whereby AES = (EC × $S_R$) - ($E_{BC}$ × $S_R$)**
EC – current energy consumption – 500 kWh/ sq. m
$E_{BC}$ – consumption as per energy-efficient bulding codes – 110 kWh/ sq.m
$S_R$- area of new constructed residence buldings according the new building code

***Measure 1.2.1. Reducing coal consumption through gasification of households and boiler houses, through the implementation of Gazprom Kyrgyzstan projects.***

The General Scheme for Gas Supply and Gasification of the Kyrgyz Republic envisages the gasification of about 400 settlements and more than 845 thousand apartments and households. The length of inter-settlement gas pipelines may reach nearly 2,750 km, while distribution pipelines within settlements may exceed 4,400 km. This would increase the national gasification level from 22% to 60%. Switching households from coal to natural gas will lead to a threefold reduction in GHG emissions. Currently, household gasification has reached 44%[198] In 2023, household gasification stood at 38%, with GHG emission reductions of 341.41 kt $CO_2$ eq.

*GHG emissions reduction calculation.* The calculations were made as per the following formula:

**$ER_{GASIFICATION} = E_{COAL} – E_{GAS}$**

Where:
$ER_{GASIFICATION}$ – emissions reduction after gasification
$E_{COAL}$ – emission from coal combustion when reaching equal calorific value with compared amoun of burt gas
$E_{GAS}$- emissions from gas combustion

***Measure 1.3.1. Increasing the capacity of existing hydropower plants.***

Within the framework of the Fuel and Energy Complex Development Strategy of the Kyrgyz Republic until 2025, the reconstruction of existing HPP capacities was initiated. The plan included: increasing the capacity of each hydropower unit at the Toktogul HPP by 60 MW, bringing total capacity to 240 MW starting in 2022; increasing capacity by 120 MW through the commissioning of the second unit at Kambarata HPP-2 starting in 2024; increasing capacity by 36 MW through commissioning of Uch-Kurgan HPP starting in 2025; and increasing capacity by 4 MW through commissioning of At-Bashi HPP starting in 2021.[199]

To date, reconstruction has been completed at At-Bashi HPP (2023), and two units at Toktogul HPP and Uch-Kurgan HPP (2024). Reconstruction works at Toktogul HPP and Kambarata HPP-2 are ongoing. The increase in “clean” electricity generation from HPPs reduces the grid emission factor of the entire power sector. In 2023, HPP capacity increased by 4 MW, resulting in GHG emission reductions of 1.09 kt $CO_2$ eq.

*GHG emissions reduction calculation.* The calculations were done according to the methodology used in the projects related to the commissioning of a clean energy source. Conventionally, it is assumed that the dirty energy generated by OJSC Electrical stations in the cities of Bishkek, and Karabalta (Production

[198] https://kyrgyzstan.gazprom.ru/about/project/genshema/
[199] Ibid.

Association for Electricity, Heat and Water Supply) will be replaced with clean energy from HPP. Coefficient of the used capacity is assumed as 40% or HPP works 3,504 hours per year. Then, emissions reduction will be the following:

$$\mathbf{ER_{RHPP} = EF \times Gn}$$

Where:
$ER_{RHPP}$ – emissions reduction after HPP renovation
EF – $CO_2$ emission factor - 0,0776 kt $CO_2$ eq.
Gn - new (additional) installed generation capacity of clean energy.

***Measure 1.3.2. Electricity generation at existing private small HPPs.***

Within the framework of the Fuel and Energy Complex Development Strategy until 2025, the increase in generation at existing and new small HPPs in locations with pre-existing infrastructure and grid connections was planned. Since 2017, three small HPPs with a total capacity of 10.07 MW have been commissioned; since 2023, four new small HPPs with a total capacity of 8.4 MW have been commissioned; and by 2025, 13 new small HPPs with a total capacity of 65.99 MW are planned. Increased "clean" electricity generation from small HPPs will reduce the grid emission factor of the entire power sector. As of 2023, the capacity of small HPPs was 8.7 MW, with GHG emission reductions of 5.02 kt $CO_2$ eq.

*GHG emissions reduction calculation.* The calculations were done according to the methodology used in the projects related to the commissioning of a clean energy source. Conventionally, it is assumed that the dirty energy generated by OJSC Electrical stations in the cities of Bishkek, and Karabalta (Production Association for Electricity, Heat and Water Supply) will be replaced with clean energy from HPP. Coefficient of the used capacity is assumed as 40% or HPP works 3,504 hours per year. Then, emissions reduction will be the following:

$$\mathbf{ER_{NSHPP} = Gn \times EF}$$

Where:
$ER_{NSHPP}$ – emissions reduction after increased generation capacity od small HPP
Gn – new (additional) installed generation capacity
EF - $CO_2$ emission factor - 0,0776 kt $CO_2$ eq.

***Measure 1.3.3. Construction and commissioning of new small HPPs.***

Within the framework of the Fuel and Energy Complex Development Strategy until 2025, the increase in generation through construction of new small HPPs in locations without pre-existing infrastructure and grid connections was planned. The Ministry of Energy identified river sites requiring higher construction costs. These small HPPs are expected to be commissioned by 2030. Increased "clean" electricity generation from small HPPs will reduce the grid emission factor of the entire power sector.

***Measure 1.3.4. Reduction of losses in the National Electric Grids of Kyrgyzstan (NEGK) during electricity transmission.***

The transmission grid of OJSC "NESK" mainly operates at three voltage levels: 500 kV, 220 kV, and 110 kV. Most elements of the grid have been in operation for more than 25 years, affecting reliability and power quality. Reconstruction and modernization of high-voltage equipment (above 35 kV) used for electricity transmission should reduce technical losses to international standards. Reducing transmission losses will lower GHG emissions from the power sector overall. In 2023, transmission losses were reduced to 5.35%, with GHG emission reductions of 5.33 kt $CO_2$ eq.

In 2022, four distribution companies – Severelektro, Vostokelektro, Oshelektro, and Jalalabadelektro – were merged into OJSC "NESK." The distribution grid of OJSC "NESK" now mainly operates at three voltage levels: 35 kV, 10/6 kV, and 0.4 kV. Most elements of these networks have been in operation for more than 25 years, affecting the reliability of components and the quality of electricity supply.

*GHG emissions reduction calculation.* The calculations were done according to the methodology used in the projects aimed to decrease electricity loss in the grids. Conventionally, it is assumed that the dirty energy generated by OJSC Electrical stations in the cities of Bishkek, and Karabalta (Production Association for Electricity, Heat and Water Supply) is being replaced with clean energy. It is assued that, losses during transmission will be assigned to clean energy, and emissions reductions will occur after clean energy increase after mitigation measures.

$$\mathbf{ER_{LOSSES\ Transmission\ Electro} = EF \times (E_{before} - E_{after})}$$

Where:
$ER_{LOSSES\ Transmission\ Electro}$ – emission reductions after electricity transmission loses reduction
$E_{before}$ – energy with losses before measures
$E_{after}$ – energy with decreased losses after measures
EF - $CO_2$ emission factor - 0,0776 kt $CO_2$ eq.

***Мера 1.4.1 - 1.4.2 Reducing electricity distribution losses (former Severelektro, Vostokelektro, Oshenergo).***

Electricity losses in the distribution networks of NESK (National Electric Grids of Kyrgyzstan) through the Severelektro distribution company, with target reduction levels of 9–10%, were reduced to 10.9% in 2023. This resulted in GHG emission reductions of 10.450 kt $CO_2$ eq. A reduction of 10.29% in the Vostokelektro distribution networks led to GHG emission reductions of 2.201 kt $CO_2$ eq. in 2023. Reducing electricity losses in the Oshenergo distribution networks by 10.29% resulted in GHG emission reductions of 3.468 kt $CO_2$ eq. in 2023. Reduction of electricity losses in the Jalal-Abadelektro networks to 10.29% made it possible to achieve GHG emission reductions of 2.85 kt $CO_2$ eq. in 2023.

*GHG emissions reduction calculation.* The calculations were done according to the methodology used in the projects aimed to decrease electricity loss in the grids. Conventionally, it is assumed that the dirty energy generated by OJSC Electrical stations, and Karabalta (PAEHWS) is being replaced with clean energy. It is assued that, losses during distribution will be assigned to clean energy, and emissions reductions will occur after clean energy increase after mitigation measures.

$$\mathbf{ER_{LOSSES\ Distribution\ Electro} = EF \times (E_{before} - E_{after})}$$

Where:
$ER_{LOSSES\ Districution\ Electro}$ – emission reductions after electricity distribution loses reduction
$E_{before}$ – energy with losses before measures
$E_{after}$ – energy with decreased losses after measures
EF - $CO_2$ emission factor - 0,0776 kt $CO_2$ eq.

***Measure 1.5.1. Reducing heat distribution losses.***

According to data from the Municipal Enterprise Bishkekteploset, the depreciation of heat supply networks in 2023–2024 exceeded 70%, reaching 72–76%. This means that most of the equipment and pipelines require replacement or major overhaul. Measures aimed at improving the efficiency of the heat supply

networks are implemented on an ongoing basis. The modernization and upgrading of networks and equipment for distributing heat energy and hot water supply (HWS) are aimed at achieving a heat loss level of 24–25%. Reducing heat losses during distribution lowers the overall GHG emissions of the energy sector.

The target performance indicator envisaged a reduction of heat losses in Bishkek by 24–25% annually. In 2023, the reduction reached 25.7%, which corresponded to GHG emission reductions of 3.09 kt $CO_2$ eq.

*GHG emissions reduction calculation.* The calculations were done according to the methodology used in the projects aimed to decrease heat loss in the networks. Conventionally, it is assumed that the dirty energy generated by OJSC Electrical stations, and Karabalta PAEHWS is being be replaced with clean energy. It is assued that, losses during distribution will be assigned to clean energy, and emissions reductions will occur after clean energy increase after mitigation measures.

$$\mathbf{ER_{LOSSES\ Distribution\ Heat} = EF \times (E_{before} - E_{after})}$$

Where:
$ER_{LOSSES\ Districution\ Electro}$ – emission reductions after electricity distribution loses reduction
$E_{before}$ – energy with losses before measures
$E_{after}$ – energy with decreased losses after measures
EF - $CO_2$ emission factor - 0,0693 kt $CO_2$ eq.

### *1.5.2 Measure 1.5.2. Modernization of district heating networks to improve energy efficiency.*

There are 19 pumping stations for hot water distribution across Bishkek. Reconstruction works were carried out, and 36 pumps with variable speed drives were installed at 13 pumping stations. In addition, heating points with a Supervisory Control and Data Acquisition (SCADA) system will be installed at all 19 pumping stations, enabling real-time monitoring of all heat flows. This system has reduced electricity consumption by 33%. Reducing electricity consumption in heat distribution decreases overall GHG emissions from the energy sector.

As a result of the modernization of the district heating networks, the target indicator “Reduction of electricity consumption by heating system pumps” was set at 33%. This indicator was achieved in 2023, with GHG emission reductions amounting to 0.57 kt $CO_2$ eq.

*GHG emissions reduction calculation.* The calculations were done according to the methodology used in the projects aimed to decrease electricity loss in the networks. Conventionally, it is assumed that the dirty energy generated by OJSC Electrical stations, and Karabalta PAEHWS is being be replaced with clean energy. It is assued that, losses during distribution will be assigned to clean energy, and emissions reductions will occur after clean energy increase after mitigation measures.

$$\mathbf{ER_{E\text{-}EFF\ Heatnets} = EF \times (E_{before} - E_{after})}$$

Where:
$ER_{E\text{-}EFF\ Heatnets}$ - emission reductions after the reduction of the heat nets’ electricity cconsumption
$E_{before}$ – energy consumed before measures
$E_{after}$ – energy consumed after measures
EF - $CO_2$ emission factor - 0,0776 kt $CO_2$ eq.

### *2.4.1.3 Conditional policies and measures in the Energy sector*

Twelve direct mitigation policies and economic measures under the NDC in the Energy sector, identified in the NDC and planned for implementation under the "With Additional Measures" scenario, subject to the provision of international support, are presented in Table 2.17.

*Table 2.17. Mitigation measures and GHG emission reductions under the WAM scenario*

| № | Policies and Measures | Indicators | Target Values | Implement-tion Period (years) | Expected Reduc-tions, kt $CO_2$ eq.[200] | Progress Assessment (2023) | |
|---|---|---|---|---|---|---|---|
| | | | | | | Activity Indicators | Mitigation Indica-tors, kt $CO_2$ eq. |
| ***Objective 1.6. Improving energy efficiency of existing buildings and households, taking into account the needs of vulnerable groups*** | | | | | | | |
| **1.6.1.** | Scaling-up installation of en-ergy-efficient stoves in house-holds | Number of energy-ef-ficient stoves in-stalled in households | 127 thousand units annually | 2021–2030 | 2025 – 177.91; 2030 – 1,067.48 | 89 units | 0.13 |
| **1.6.2.** | Improving energy efficiency of small boiler houses through re-placement of coal boilers with gas-fired ones | Number of small boiler houses con-verted to gas ( | 48 boiler houses of Bishkektep-loset (BTS), 136 public and pri-vate | 2021–2030 | 2025 – 198.17; 2030 – 236.46 | 19 BTS boiler houses and 36 private boiler houses | 59.23 |
| **1.6.3.** | Improving energy efficiency of existing buildings | Area of public build-ings | 1,000.161 thou-sand m² of pub-lic buildings | 2021–2030 | 2025 – 0; 2030 – 10.87 | Not assessed | Not assessed |
| ***Objective 1.7. Development of renewable energy sources*** | | | | | | | |
| **1.7.1** | Installation and exploitation of BGPPs [201] in agriculture | Total volume of BGPPs [202] in agricul-tural regions | 15 thousand m³ | 2021–2030 | 2025 – 3,785.22; 2030 – 4,346.86 | Not installed | Not assessed |
| **1.7.2** | Installation of BGPPs at sanitary landfills in Bishkek and Osh | Total volume of BGPPs at sanitary landfills in Bishkek and Osh | 1 thousand m³ | 2021-2030 | | Not installed | Not assessed |
| **1.7.3.** | Installation of BGPPs at wastewater treatment plants in Bishkek and Osh | Total volume of BGPPs at wastewater treatment plants in Bishkek and Osh | 2 thousand m³ | 2021-2030 | | Not installed | Not assessed |

[200] The estimates of GHG emission reductions presented were calculated by the expert group of the Aarhus Center in accordance with the sectoral methodologies of the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. The reduction estimates proposed by other stakeholders remain under their responsibility.

[201] The development of the use of Biogas Power Plants (BGPPs) includes the potential of entities dealing with organic waste in all sectors; however, they must be accounted for in the reporting under the "Energy" sector within the general category of "Fuel Combustion" and are attributed to the "With Additional Measures (WAM)" scenario.

[202] BGPPs for cattle (Cattle/Large Horned Livestock – CLL): Agrofirm Chabrets, Breeding Farm Atzhaly Uluk, Cooperative Vetka, Agrofirm El Dan-Atalyk – 4 units of 500 m³ each;
Poultry – Sokuluk OJSC Ak-Kuu, Tri T (Kant), OJSC Ular (Alamedin district), Natural Agro (Bishkek), Shumkar (Balykchy) – 5 units of 1,000 m³ each;
Other cattle farms – 160 BGPs of 50 m³ each.

| № | Policies and Measures | Indicators | Target Values | Implement-tion Period (years) | Expected Reduc-tions, kt $CO_2$ eq.[200] | Progress Assessment (2023) | |
|---|---|---|---|---|---|---|---|
| | | | | | | Activity Indicators | Mitigation Indica-tors, kt $CO_2$ eq. |
| **1.7.4** | Installation of BGPPs in the food industry | Total volume of BGPPs in the food in-dustry | 10 thousand m³ | 2021-2030 | | Not installed | Not assessed |
| **1.7.5.** | Expansion of the use of solar thermal collectors for hot water supply | Total capacity of in-stallations | 50 MW. | 2021-2030 | В 2025 г – 0<br>В 2030 г – 78,40 | Not installed | Not assessed |
| | | Number of flat plate collectors | Install 35,715 flat-plate collec-tors with a total capacity of 50 MW. | | | Not installed | Not assessed |
| **1.7.6.** | Development of solar power generation | Solar power plants with total installed capacity | 300 MW | 2021–2030 | 2025 – 0; 2030 – 13.00 | Not installed | Not assessed |
| **1.7.7** | Expansion of geothermal energy use (installation of heat pumps) | Total installed capac-ity of heat pump units; Number of heat pumps | 50.00 MW; 2,000 units of 25 kW each | 2021–2030 | 2025 – 0; 2030 – 38.59 | Not installed (as of 2023) | Not assessed |
| **1.7.8** | Implementation of the wind power project of OJSC “Kyrgyz Wind Systems” for wind energy development | Total installed capac-ity | 600 MW | 2021–2030 | 2025 – 0; 2030 – 3.59 | Not installed | Not assessed |
| **Objective 1.8. Development of large hydropower** | | | | | | | |
| **1.8.1.** | Construction of new hydro-power plants / Upper Naryn cas-cade | Installed capacity of HPPs constructed since 2021 | 237.7 MW | 2021–2030 | 2025 – 0; 2030 – 64.606 | Not installed | Not assessed |

### *2.4.1.3.1 Implementation of conditional NDC policies and measures in the Energy sector*

In the Energy sector, under the updated NDC of 2021, the implementation of conditional measures under the “With Additional Measures” (WAM) scenario was planned in the following main policy areas:

1.1. Improving energy efficiency of existing buildings
1.2. Development of renewable energy sources
1.3. Development of large hydropower

***Measure 1.6.1. Scaling-up installation of energy-efficient stoves in households.***

Energy-efficient coal stoves for households allow for savings of up to 30% of coal consumption, thereby reducing GHG emissions. A pilot of 89 stoves, [203], manufactured in the Kyrgyz Republic with the support of the World Bank, confirmed their actual effectiveness under local conditions. Unfortunately, it was not possible to secure additional resources for continuation of the project. According to the 2023 assessment, GHG emission reductions amounted to 0.13 kt $CO_2$ eq.

*Calculation of GHG emission reductions.* The methodology used for the calculations is applied in projects related to the transition to coal combustion in energy-efficient stoves for households. It is based on determining the difference in emissions from the reduction in coal combustion volumes due to the use of energy-efficient stoves in private households instead of traditional ones. Thus, to obtain the same amount of energy, 35% less coal needs to be burned, which leads to lower GHG emissions. The calorific values of coal and their emission factors in accordance with IPCC 2006 were used.

$$\mathbf{ER}_{\text{E-EFF STOVES}} = (Ac \times 0{,}35) \times Cc$$

Where:
$\mathbf{ER}_{\text{E-EFF STOVES}}$ – emissions reduction after installation of energy-efficient stoves
Ac – amount of coal combusted in a standard stove. (NSK data on coal consumtion by population and projections)
Cc- emissions from the combustion of sub-bituminous coal, when burning coal with a coefficient of 1.8163 kt $CO_2$eq.

***Measure 1.6.2. Improving energy efficiency of small boiler houses through replacement of coal boilers with gas-fired ones.***

The replacement of coal-fired municipal and private boiler houses for local heating and hot water supply of individual buildings reduces GHG emissions threefold due to the use of natural gas, which has a lower GHG emission factor than coal. By 2024, the Bishkek municipality had already converted 22 boiler houses to gas, while 39 private boiler houses were supplying newly built multi-storey residential buildings.[204] According to 2023 estimates, GHG emission reductions amounted to 59.23 kt $CO_2$ eq.

*Calculation of GHG emission reductions*. This methodology is used in calculations and projects related to the transition to natural gas combustion compared to coal combustion for energy production. It is generally assumed that combustion involves a switch to a more environmentally friendly fuel. It is assumed that when 1 million m3 of gas is burned, 2.6928 kt CO2eq is emitted. The calorific value of coal is 1 kt = 11.9 Tj, and when 1 kt of coal is burned, the coefficient is 1.8163 kt CO2eq. Thus, to obtain the same amount of energy, approximately four times more coal must be burned, which leads to higher GHG emissions than from burning gas. Data on planned gas supplies for small boiler rooms from Gazprom Kyrgyzstan was used.

$$\mathbf{ER}_{\text{BOILERS Gas}} = Ec - Eg$$

Where:
$ER_{\text{BOILERS Gas}}$ – emission reduction after switching boilers from coal to gas
Ec – emissions from coal combustion when achieving the same amount of heat output as the comparable amount of gas combustion.
Eg – emissions from gas combustion.

***Measure 1.6.3. Improving energy efficiency of existing buildings.***

[203] https://www.aris.kg/
[204] https://kyrgyzstan.gazprom.ru/

The total area of 5,000 public buildings requiring renovation amounts to 5,300,000 m².[205] A phased rehabilitation is planned: (1) the education sector and kindergartens – 3,270,322 m²; (2) healthcare – 210,668 m²; and (3) other administrative and social buildings – 1,811,347 m². The general condition of buildings is considered satisfactory. However, about 50% of the building stock covered under the World Bank project study was constructed between 1950 and 1980, meaning their service life exceeds 40–60 years. Only a small proportion of these buildings have undergone any renovations in recent years. Public buildings in the Kyrgyz Republic consume about 850 GWh of energy annually, and this sector is one of the largest final consumers of energy, including coal. If the selected energy efficiency measures are implemented, the overall theoretical energy saving potential would be 50–60% of total consumption, leading to significant GHG reductions. Unfortunately, resources for this measure have not yet been mobilized. It is recommended to continue resource mobilization.

**Development of RES.**

According to the Ministry of Energy of the Kyrgyz Republic, the RES potential is: wind power – 44.6 million kWh per year, solar power – 490 million kWh per year, and biomass energy production – 1.3 billion kWh per year.[206]. Within the framework of the RES development policy, the following measures were planned.

***Measure 1.7.1. Installation and use of biogas units in agriculture.***

According to the National Statistical Committee of the Kyrgyz Republic, in 2022 the potential of solid biomass from agricultural residues amounted to 1,871.01 thousand tonnes per year. The livestock population included 1,749,911 cattle, 29,508 pigs, 5,923,063 poultry, and 6,277,897 sheep and goats, with a total waste potential from livestock enterprises of 13,980,379 tonnes per year.[207] All this waste requires efficient processing, since methane released during the decomposition of organic waste is one of the most powerful greenhouse gases, and its utilization and use as fuel are required. When combusted, methane emits three times fewer GHGs than if it were released directly into the atmosphere. At present, the Kyrgyz Republic has up to 100 pilot modern medium-sized biogas units (reactor capacity 20–150 m³) and about 20 artisanal biogas units (reactor capacity 3–10 m³). It is necessary to construct industrial-scale BGPPs at farms with permanent livestock housing. Resources for the implementation of this measure have not yet been mobilized.

***Measure 1.7.2. Installation of biogas units at sanitary landfills in Bishkek and Osh.***

According to the National Statistical Committee of the Kyrgyz Republic, municipal solid waste disposal in 2021 amounted to 356.9 thousand tonnes in Bishkek and 406.4 thousand tonnes in Osh.[208] These wastes also contain organic (food) components which, during decomposition, release methane. Since methane is one of the most powerful greenhouse gases, effective processing of this waste is required, including methane capture and utilization as fuel. When combusted, methane emits three times fewer GHGs compared to direct release into the atmosphere. The construction of industrial-scale BGPPs at landfills where MSW is disposed of is necessary. However, resources for the implementation of this measure have not been mobilized.

***Measure 1.7.3. Installation of BGPPs at wastewater treatment plants in Bishkek and Osh.***

The Bishkek wastewater treatment facilities serve not only the city itself but also parts of the Chui region. They include three stages of treatment: mechanical, biological, and disinfection with chlorine. The design capacity of the facility is 380 thousand cubic meters of wastewater per day, while the actual inflow is about 220–230 thousand cubic meters. In Osh, the capacity is 100 thousand cubic meters per day. During biological treatment, methane is released, which must be

[205] https://www.vsemirnyjbank.org/ru/news/feature/2015/02/25/urban-heating-options-for-the-kyrgyz-republic
[206] https://minenergo.gov.kg/ru
[207] https://secca.eu/wp-content/uploads/2024/07/Session-2_2.-Tatiana-Vedeneva_RU_updated.pdf
[208] https://secca.eu/wp-content/uploads/2024/07/Session-2_2.-Tatiana-Vedeneva_RU_updated.pdf

captured and utilized as fuel. When combusted, methane emits three times fewer GHGs compared to direct release into the atmosphere. Construction of industrial methane-capturing BGPPs at wastewater treatment facilities is required. However, resources for the implementation of this measure have not been mobilized.

***Measure 1.7.4. Installation of BGPPs in the food industry.***

The sugar and brewing industries of the Kyrgyz Republic generate production waste in the course of manufacturing. The sugar industry annually produces about 60 thousand tonnes of beet pulp, while the brewing industry produces about 1.5 thousand tonnes of brewing waste.[209] These wastes require effective processing, as methane released during decomposition of organic waste is one of the most powerful greenhouse gases, and its capture and utilization as fuel is necessary. When combusted, methane emits three times fewer GHGs compared to direct release into the atmosphere. Construction of industrial BGPPs directly at production enterprises is necessary. However, resources for the implementation of this measure have not been mobilized.

***Measure 1.7.5. Expansion of the use of solar thermal collectors for hot water supply.***

The Kyrgyz Republic annually receives an average of 4.64 billion MWh of solar radiation, or 23.4 kWh per square meter, making it one of the most promising directions for the use of renewable energy sources for hot water supply and heating. Pilot projects have been implemented, including the installation of collectors for HWS at the municipal enterprise "Bishkekteploenergo" with a total capacity of 0.518 MW or 0.445 Gcal/hour; [210]; at the "Bermet" tourist resort (50 m³ of HWS per day); six collectors at social facilities in Batken region (school, feldsher-midwife station (FAP), mosque, border post); and other social buildings in Chui region. To fully utilize this potential, external financing is required. Resources for the implementation of this measure have not been mobilized.

***Measure 1.7.6. Development of solar power generation.***

According to studies, the average annual duration of sunshine is between 2,100 and 2,900 hours, and the annual solar radiation on a horizontal surface ranges from 1,000 to 1,700 kWh/m², with more than 50% of radiation being direct solar radiation. The average potential for photovoltaic energy generation in the Kyrgyz Republic is estimated at 490 million kWh per year, allowing for financial planning and business model development based on aggregated annual data. In recent years, with donor and international organization support, numerous pilot projects have been implemented to install photovoltaic systems (PVS) with a capacity of 0.5–3 kW, including in remote regions, at social facilities (FAPs, schools, hospitals), tourist facilities, private households, and small enterprises, both grid-connected and off-grid. In addition, donor-supported industrial-scale photovoltaic generation projects have been implemented at several sites: Orlovka village in Chui region (100 kW, OJSC Kyrgyz Chemical and Metallurgical Plant), the roof of Kyrgyz Technical University (80 kW), the roof of OJSC NESK (50 kW), and a floating photovoltaic system at the Daily Regulation Basin of HPP-5 (OJSC Chakan HPP) with a capacity of 100 kW.[211] To fully utilize this potential, external financing is required. Resources for the implementation of this measure have not been mobilized.

***Measure 1.7.7. Expansion of geothermal energy use (installation of heat pumps).***

Heat pumps operate on the principle of a reverse thermodynamic cycle: the device absorbs heat from an external source of geothermal energy (air, water, soil) and transfers it into the heating system to heat the circulating fluid. To deliver 1 kWh of thermal energy into the heating system, the installation requires only 0.2–0.35 kWh of electricity. The use of heat pumps allows substitution of fossil fuels, primarily coal, thereby reducing GHG emissions through the use of the

[209] https://stat.gov.kg/ru/
[210] https://minenergo.gov.kg/ru
[211] https://minenergo.gov.kg/ru

potential energy of the environment combined with a small amount of electricity, which serves as a cleaner energy source. To fully utilize this potential, external financing is required. Resources for the implementation of this measure have not yet been mobilized.

***Measure 1.7.8. Implementation of the wind power project of OJSC "Kyrgyz Wind Systems" for wind energy development.***

According to the Ministry of Energy, the potential electricity generation from wind power plants is 44.6 million kWh per year. OJSC "Kyrgyz Wind Systems," with the involvement of an external investor, has completed design works and initiated the construction of the first industrial wind turbine with a capacity of 2 MW in the Issyk-Kul region, as part of the first stage of a planned 50 MW wind farm. [212] However, resources for full-scale implementation of this measure have not yet been mobilized. It is recommended to continue resource mobilization.

***Measure 1.8.1. Construction of new hydropower plants / Upper Naryn cascade.***

According to the Ministry of Energy of the Kyrgyz Republic, the total national hydropower potential is estimated at 142.5 billion kWh per year, including 5–8 billion kWh per year from small hydropower. [213] Under the Fuel and Energy Complex Development Strategy of the Kyrgyz Republic until 2025, the following projects are planned: Upper Naryn HPP cascade with a capacity of 237.7 MW by 2028; Kazarman HPP cascade with a capacity of 1,160 MW by 2040; and Kambarata HPP-1 with a capacity of 1,860 MW by 2040. Currently, preparatory infrastructure works have been initiated for the construction of the Upper Naryn cascade HPP and Kambarata HPP-1[214] In June 2024, the Ministries of Energy of Kyrgyzstan, Kazakhstan, and Uzbekistan signed an agreement on the joint implementation of the Kambarata HPP-1 project on the Naryn River in the Kyrgyz Republic. To fully utilize this potential, external financing is required. Resources for the implementation of this measure have not yet been mobilized. It is recommended to continue resource mobilization.

## 2.4.2. Transport

### *2.4.2.1 Institutional arrangements for the implementation of policies and measures*

*Table 2.18. Institutional arrangements for NDC implementation in the transport sector*

| № | Policies and Measures | Responsible Government Agencies and Partners |
|---|---|---|
| **Policy 2. Reduction of GHG emissions in the Transport sector** | | |
| **Unconditional mitigation policies and measures** | | |
| ***Objective 2.1. Improving traffic management and developing cycling infrastructure*** | | |
| **2.1.1** | Improvement of traffic management and planning | Bishkek Municipality, Ministry of Transport and Communications (MTC), State Agency for Road Safety (SARS) |
| **2.1.2** | Development of cycling infrastructure | Bishkek Municipality, MTC |
| ***Objective 2.2. Improvement of the overall system for public transport management and use of vehicles*** | | |
| **2.2.1** | Capacity-building and introduction of an improved fare payment system, economic measures [215] | MTC, Municipalities of Bishkek and Osh, municipal transport enterprises, Ministry of Economy and Commerce (MEC) |
| **Conditional measures (WAM scenario, subject to international support)** | | |

[212] https://minenergo.gov.kg/ru
[213] Ibid.
[214] Ibid.
[215] Electronic ticketing, restrictions on the import of vehicles that do not meet environmental standards, changes in the transport tax rate for old vehicles, favorable conditions for electric and hybrid vehicles, etc.

| № | Policies and Measures | Responsible Government Agencies and Partners |
|---|---|---|
| ***Objective 2.3. Development of electric transport*** | | |
| **2.3.1** | Replacement of passenger vehicles with internal combustion engines (ICE) with electric vehicles (EVs) | MTC, MEC, Ministry of Finance (MF), private users |
| **2.3.2** | Expansion of public electric transport with replacement of ICE buses and installation of charging station networks | MTC, Bishkek Municipality, municipal transport enterprises |
| ***Objective 2.4. Replacement of ICE buses with gas-powered buses*** | | |
| **2.4.1** | Replacement of ICE buses with gas-powered buses in Bishkek | Bishkek Municipality, municipal transport enterprises |
| **2.4.2** | Replacement of ICE buses with gas-powered buses in Osh | Osh Municipality, municipal transport enterprises |
| **2.4.3** | Replacement of ICE buses with gas-powered buses on suburban routes in Bishkek | Bishkek Municipality, municipal transport enterprises |
| ***Objective 2.5. Improvement of vehicle operation and management systems*** | | |
| **2.5.1** | Eco-driving and vehicle maintenance | Driving schools, Ministry of Internal Affairs (MIA) |

### *2.4.2.2 Unconditional policies and measures in the Transport sector*

Three unconditional direct mitigation measures in the Transport sector, identified in NDC-2 and planned for implementation under the "With Measures" scenario, are presented in Table 2.19. For the description of the results of both conditional and unconditional policies and measures in the transport sector, data for 2025 were used, as these data were provided by the municipalities of the cities of the Kyrgyz Republic.

*Table 2.19. Mitigation measures and GHG emission reductions in the Transport sector under the WM scenario*

| № | Policies and Measures | Indicators | Target Values | Implementation Period (years) | Expected Reductions, kt $CO_2$ eq.[216] | Progress Assessment (2023) | |
|---|---|---|---|---|---|---|---|
| | | | | | | Activity Indicators | Mitigation Indicators, kt $CO_2$ eq. |
| **Policy 2. Reduction of GHG emissions in the Transport sector** | | | | | | | |
| **Unconditional mitigation policies and measures** | | | | | | | |
| **Objective 2.1. Improving traffic management and developing cycling infrastructure** | | | | | | | |
| **2.1.1** | Improvement of traffic management and planning [217]. | GHG reductions from road transport following implementation of measures (see footnote) | 2–3% annually | 2021–2030 | 2025 – 103.67; 2030 – 232.53 | 21 ITS (intelligent traffic management systems)[218] | 56,0 |
| **2.1.2** | Development of cycling infrastructure. [219]. | Length of cycling infrastructure | 50 km of bike lanes annually | 2025–2030 | 2025 – 103.67; 2030 – 498.00 | 50.0 km of bike lanes | 34.0 |

[216] The estimates of GHG emission reductions presented were calculated by the expert group of the Aarhus Center in accordance with the sectoral methodologies of the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. The reduction estimates proposed by other stakeholders are their sole responsibility.

[217] Smart traffic lights, road intersection management, dedicated lanes, proper parking areas, reduced speed limits, road expansion and improvement, introduction of congestion charges in city centers, etc.***** Mitigation Strategies and Accounting Methods for Greenhouse Gas Emissions from Transportation. Inter-American Development Bank.https://publications.iadb.org/publications/english/document/Mitigation-Strategies-and-Accounting-Methods-for-Greenhouse-Gas-Emissions-from-Transportation.pdf стр. 33-38, THC

[218] ATSMS – Automated Traffic and Street Management Systems.

[219] Construction of bicycle lanes and bicycle parking facilities, installation of special road signs and traffic lights, provision of designated spaces for bicycles in public transport.

| № | Policies and Measures | Indicators | Target Values | Implementation Period (years) | Expected Reductions, kt $CO_2$ eq.[216] | Progress Assessment (2023) | |
|---|---|---|---|---|---|---|---|
| | | | | | | Activity Indicators | Mitigation Indicators, kt $CO_2$ eq. |
| ***Objective 2.2. Improvement of the overall system for public transport management and use of vehicles*** | | | | | | | |
| **2.2.1** | Capacity-building and introduction of improved fare payment system, economic measures [220] | Number of buses with electronic ticketing; Draft NLA (normative legal act) | Bishkek – 1,150 units; Osh – 310 units; Approved NLA | 2021–2030 | 2025 – 77.7;<br>2030 – 116.25 | 1,460 validators; 1 NLA | 10.0<br>~19.0 |

### *2.4.2.2.1 Implementation of unconditional policies and measures in the Transport sector*

In the Transport sector, under the updated NDC of 2021, the implementation of mitigation measures under the with Measures scenario was planned in the following main policy areas:

- 2.1. Improving traffic management and developing cycling infrastructure
- 2.2. Improvement of the overall system for public transport management and use of vehicles

***Measure 2.1.1. Improvement of traffic management and planning of transport infrastructure.***

Measures to improve traffic management and urban transport infrastructure play an important role in reducing greenhouse gas emissions in the road transport sector. Such measures not only reduce travel time and improve safety, but also lead to lower idling, fewer sharp braking and acceleration events, and consequently – to reduced fuel consumption and related GHG emissions.

In Bishkek, a project for "smart" traffic lights were implemented at key intersections. Twenty-one intersections were equipped with an Automated Traffic Control System (ATCS). The measure demonstrates significant progress, with 54% of implementation expected by 2025, and further expansion of intersections covered by ATCS planned under municipal programmes and with the involvement of external financing. It is recommended to extend the deployment of ATCS to over 100 intersections in major cities.

*Calculation of GHG emission reductions.* In order to calculate the reduction in $CO_2$ emissions per year at 21 intersections with ASUDD installation, we will take into account several assumptions:

1) Reduction in waiting time at intersections, reducing idling of vehicles.

The difference in waiting time at one intersection with ASUDD is 0.5 minutes. Fuel consumption = 1.5 l/hour × 0.00833 hours = 0.0125 l. $CO_2$ emissions per 1 liter of fuel - 2.3 kg $CO_2$.

Reduction in fuel consumption per vehicle due to reduced time at traffic lights: 0.0125 liters per vehicle per day. Reduction in $CO_2e$ emissions per vehicle per day: 0.0125 × 2.3 = 0.02875 kg $CO_2e$. Total reduction in $CO_2e$ emissions for 90,000 cars per day: 90,000 × 0.02875 = 2,587.5 kg $CO_2e$ per day. Reduction in

[220] Electronic ticketing, restrictions on the import of vehicles that do not meet environmental requirements, changes in the transport tax rate for old vehicles, favorable conditions for electric and hybrid vehicles, etc.

$CO_2e$ emissions per year (365 days): 2,587.5 × 365 = 944,437.5 kg $CO_2e$ per year or 944.44 tons $CO_2e$. Total reduction in $CO_2$ emissions at 21 intersections per year: 944.44 × 21 = 19,818.24 tons $CO_2e$ per year. The reduction in $CO_2e$ emissions at 21 intersections due to the installation of the ASUDD will be approximately 19.82 kt $CO_2e$ per year.

2) Reduction in the frequency of acceleration and braking, which reduces fuel consumption.

To account for this effect, the following parameters should be considered:

The total number of vehicles passing through intersections is 90,000. The average number of accelerations and decelerations per 100 km in the city is approximately 5-10 times (city data can be used as a reference). Fuel consumption reduction with fewer accelerations and braking maneuvers - 10-15%. On average, one acceleration or braking increases fuel consumption by 0.5 liters per 100 km. If the introduction of the ASUDD reduces the number of such maneuvers by, say, 15%, then the reduction in fuel consumption will be 8 × 0.15 = 1.2 liters per 100 km. The total number of kilometers for all vehicles passing through 21 intersections (90,000 vehicles traveling 40 km per day): 90,000 × 40 = 3,600,000 km per day. Total fuel consumption taking into account the reduction (reduction of 1.2 liters per 100 km): (3,600,000 km/100) × 1.2 = 43,200 liters of fuel per day. $CO_2$ emissions reduction: 43,200 × 2.3 = 99,360 kg $CO_2$ per day. Emissions reduction per year (365 days): 99,360 × 365 = 36,257,400 kg $CO_2e$ = 36,257 tons $CO_2e$.

Taking into account the reduction in the number of accelerations and decelerations due to the ASUDD, the reduction in $CO_2$ emissions at 21 intersections will be approximately 36,257 tons of $CO_2$ per year. Taking into account the reduction in idling at intersections and the number of accelerations and decelerations due to the ASUDD, the reduction in $CO_2$ emissions at 21 intersections will be approximately 1) + 2) or 19.82 kt + 36.25 kt = 56.10 kt $CO_2e$ per year.

***Measure 2.1.2. Development of cycling infrastructure – construction of bike lanes, bike parking, installation of special road signs and traffic lights, and provision of dedicated spaces for transport of bicycles on public transport.***

The promotion of active mobility, in particular the development of cycling infrastructure, is considered one of the mitigation measures within the Kyrgyz Republic's Nationally Determined Contribution. Replacing short trips by private vehicles with cycling can significantly reduce GHG emissions, especially in dense urban areas. In addition, such measures contribute to improved public health.

According to the NDC Implementation Plan, the 2025 target was set as the construction of 50 km of bike lanes annually. However, an analysis of implementation progress shows that this target proved to be overly ambitious.

As of 2025, 50 km of bike lanes had been constructed, but this amount was cumulative over the period 2017–2025, i.e., over seven years. Thus, the annual target of 50 km/year was unrealistic under current budgetary and institutional capacities. The actual annual pace amounted to approximately 7 km/year. GHG emission reductions from 50 km of bike lanes are estimated at 34 kt $CO_2$ eq. (based on GASMO modelling).

*Calculation of GHG emission reductions.* The GASMO tool developed by the Copenhagen Climate Center of the United Nations Environment Programme was used to calculate GHG emission reduction values. The following parameters were used for the calculation: Annual use of bike lanes = 10 million passenger-km/km/year; Number of passengers in a car = 2; Car fuel economy = 12.3 km/l; Gasoline emission factor: 1 tne = 41.87 GJ, 1 tne of gasoline = 1,246 l or 1 l = 0.0336035 GJ. Then, 69.3 kg $CO_2$/GJ ≈ 2.3287 kg $CO_2$/l = 0.0023287 t/l. Fuel savings amount to 0.295 million liters.

Verification of the breakdown (with 72.6% transition from cars): Passenger-km coming "from cars": 10 million × 0.7257 = 7,257 million passenger-km. Car-km (based on 2 people/car): 7,257/2 = 36,285 million car-km. Liters of gasoline: 3,6285 million km/12.3 km/l = 295,011 l. Emissions: 29,5011 l × 0.0023287 t/l = 687 t $CO_2$/year/1 km of bike path. For 50 km: 50 × 687 ≈ 34,330 t $CO_2$/year, the value of 34.0 kt $CO_2$/year is accepted.

***Measure 2.2.1. Capacity-building and introduction of an improved fare payment system, including economic measures.***[221]

The introduction of electronic fare payment and validators in public transport represents not only a step towards digitalization of municipal management but also an important mitigation measure aimed at reducing GHG emissions in the urban transport sector.

This measure referred to the installation of electronic validators in public transport and capacity-building for sector staff managing the system. The electronic system was introduced on bus routes in Bishkek and Osh (including QR codes and smart cards). Approximately 1,460 validators were installed. Expert assessment estimates reductions of 5–10 kt $CO_2$ eq. per year. Earlier calculations suggested reductions of about 77.7 kt $CO_2$ eq.,[222] but more recent studies allow for a more accurate assessment of the potential.

According to official letters from the municipalities of Bishkek and Osh, since 2023 the entire municipal bus fleet in both cities has been equipped with cashless fare payment and electronic ticketing systems. The equipment (validators and QR codes) was installed by private partners, which enabled rapid coverage of the entire municipal bus fleet: 1,150 buses in Bishkek and 310 buses in Osh. Thus, the total number of buses with the electronic ticketing system amounted to 1,460 units, covering the entire municipal bus fleet in the country's two largest cities.

The measure on electronic fare payment and validators has been partially implemented but covered the full municipal bus fleet in both major cities. Although the system was introduced relatively recently, preliminary estimates already suggest emission reductions of around 10 kt $CO_2$ eq. per year, making this measure comparable in climate effectiveness to technological fuel-switch measures (CNG and electric buses).

It is recommended to extend the electronic ticketing system to include minibuses, trolleybuses, and private operator transport.

*Calculation of GHG emission reductions.*1) Introduction of an improved fare payment system.

Input data for calculation and assumptions: 1,150 buses in Bishkek, 310 buses in Osh; Average daily mileage per bus: 200 km; Average fuel consumption per bus: 35 liters per 100 km; $CO_2$ emissions per liter of diesel: 2.68 kg $CO_2$; Expected reduction in fuel consumption due to validators: 5-10%.

Fuel consumption calculation: Total mileage per day: (1,150 + 310) × 200 = 292,000 km per day. Total fuel consumption per day: 292,000 × 35 × 100 = 102,200 liters per day. $CO_2$ emissions per day: 102,200 × 2.68 = 273,896 kg $CO_2$ (273.9 tons $CO_2$).

Expected reduction in emissions by 5% and 10%: 273,896 × 0.05 = 13,695 kg $CO_2$ (13.7 tons $CO_2$ per day) 273,896 × 0.10 = 27,389 kg $CO_2$ (27.4 tons $CO_2$ per day); Per year: (13.7 × 365 days) = 5,000 tons of $CO_2$ (at 5%); (27.4 × 365 days) = 10,000 tons of $CO_2$ (at 10%). Electronic ticketing can reduce emissions by 5-10 kt $CO_2$ per year by reducing downtime at stops and optimizing passenger flow. 10 kt $CO_2$ per year is accepted.

2) Economic measures. Import of used cars. Assumption: instead of 10,000 old cars, the same number of new energy-efficient cars are imported. Number of cars: 1,000 units (unit of measurement used in the GASMO tool model). Average annual mileage: 22,515 km/car; Fuel efficiency: 10.0 km/l; Annual fuel consumption: 1,000 × 22,515/9.72 = 2.316 million liters/year. $CO_2$ emissions: 2.316×106 liters × 2.33 kg/l = 5,397 tons of $CO_2$/year (taking into account the coefficients: 1 tne = 41.87 GJ; 1246 l/tne; 69.3 kg $CO_2$/GJ = 2.33 kg/l).

[221] Electronic ticketing, restrictions on the import of vehicles that do not meet environmental requirements, changes in the transport tax rate for old vehicles, favorable conditions for electric and hybrid vehicles, etc.

[222]* Mitigation Strategies and Accounting Methods for Greenhouse Gas Emissions from Transportation. Inter-American Development Bank.https://publications.iadb.org/publications/english/document/Mitigation-Strategies-and-Accounting-Methods-for-Greenhouse-Gas-Emissions-from-Transportation.pdf .стр 33-38

Mitigation scenario – "Restrictions on imports of used cars". Number of cars: 1000 units (not imported) (Unit of measurement adopted in the GASMO model). Average annual mileage: 22,515 km/car; Fuel efficiency: 15.0 km/l; Annual fuel consumption: 1,000 × 22,515/15.0 = 1.501 million liters/year. $CO_2$ emissions: 1,501 × 106 liters × 2.33 kg/liter = 3,496 tons of $CO_2$/year. Emissions reduction. Reduced fuel consumption: 2.316 – 1.501 = 0.815 million liters/year. $CO_2$ emissions reduction: 5,397 – 3,496 = 1,901 tons of $CO_2$/year. Or, for 10,000 cars not imported (assumption) 10,000 × 1,901 = 19.0 kt $CO_2$e.

### *2.4.2.3 Conditional policies and measures in the Transport sector*

Six additional NDC-2 measures in the Transport sector (Table 2.20) were planned for implementation subject to international support, i.e. under the "With Additional Measures" (WAM) scenario.

*Table 2.20. Conditional mitigation measures and projected GHG emission reductions in the Transport sector under the WAM scenario*

| № | Policies and Measures | Indicators | Target Values | Implementation Period (years) | Expected Reductions, kt $CO_2$ eq.[223] | Progress (2025) | |
|---|---|---|---|---|---|---|---|
| | | | | | | Activity Indicators | Mitigation Indicators, kt $CO_2$ eq. |
| ***Objective 2.3. Development of electric transport*** | | | | | | | |
| **2.3.1** | Replacement of passenger vehicles with internal combustion engines (ICE) with electric vehicles (EVs) | Share of EVs (% of all passenger cars) | 1% annually | 2025–2030 | 2025 – 54.42[224]<br>2030 – 318.48 | 6,859 units | 34.56 |
| **2.3.2** | Expansion of public electric transport with replacement of ICE buses and installation of charging stations | Number of trolleybuses; Number of e-buses; Number of charging stations | 20 units; 135 units; 50 units | 2025–2030 | 2025 – 6.84; 2030 – 6.84 | 23.0 units;<br>136.0 units;<br>50.0 units | 0.88; 5.96; NE |
| ***Objective 2.4. Replacement of buses with gasoline and diesel ICE by gas-powered engines*** | | | | | | | |
| **2.4.1** | Replacement of ICE buses with gas-powered buses in Bishkek | Number of ICE buses replaced with gas-powered buses in Bishkek | 728 units;<br>120 units | 2025–2030 | 2025 – 7.97; 2030 – 14.73 | 748 units;<br>120 units | 6.67;<br>1.30 |
| **2.4.2** | Replacement of ICE buses with gas-powered buses in Osh | Number of ICE buses replaced with gas-powered buses in Osh | 200 units | 2025–2030 | 2025 – 2.75; 2030 – 4.42 | 200 units | 1.67 |
| | | Number of minibuses with internal combustion engines replaced with minibuses powered by gas in Osh | 50 units | | | 50 units | 1.08 |

[223] The estimates of GHG emission reductions presented were calculated by the expert group of the Aarhus Center in accordance with the sectoral methodologies of the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. The reduction estimates proposed by other stakeholders are their responsibility.

[224] UNDP Assessments

| № | Policies and Measures | Indicators | Target Values | Implementation Period (years) | Expected Reductions, kt $CO_2$ eq.[223] | Progress (2025) | |
|---|---|---|---|---|---|---|---|
| | | | | | | Activity Indicators | Mitigation Indicators, kt $CO_2$ eq. |
| **2.4.3** | Replacement of ICE buses with gas-powered buses on suburban routes in Bishkek | Number of ICE buses replaced with gas-powered buses on suburban routes in Bishkek | 150 units | Until 2030 | 2025 – 0; 2030 – 2.50 | NO | NO |
| **2.4.4** | Eco-driving and vehicle maintenance | Number of trained drivers in the Kyrgyz Republic (no more than 70% of one gender) | Draft NLA – 100,000; Approved NLA | 2025–2030 | 2025 – 20.73; 2030 – 38.76 | NO | NO |

#### *2.4.2.3.1 Implementation of conditional policies and measures in the sector "Transport"*

In the Transport sector, within the framework of the updated Nationally Determined Contribution of 2021, the implementation of conditional mitigation measures under the With Additional Measures Scenario was envisaged for the following key policies:

2.3. Development of Electric Transport
2.4. Replacement of Internal Combustion Engine (ICE) Buses with Gas-Fueled Engines

The implementation of these policies is carried out through the following measures:

**Measure 2.3.1. Replacement of passenger vehicles with ICE by electric vehicles (EVs).**

The development of electric transport has been identified in the strategic documents of the Kyrgyz Republic as one of the priority directions for the decarbonization of the transport sector. In practice, however, this sector is still at the initial stage of development.

According to the Agency for Vehicle Registration, as of 1 January 2025 there were 6,859 registered electric vehicles in the country, compared to only 100 vehicles as of 1 January 2021. Thus, over four years the average growth amounted to 188% per year, indicating a significant acceleration in the transition to “green” transport despite the absence of large-scale state support.

It should be noted that according to the NDC Implementation Plan targets, by 2025 the replacement of 10,800 ICE vehicles with EVs had been foreseen. The actual result as of early 2025 represents 63.5% of the planned level, which may be considered moderately successful progress, particularly given the initial conditions and existing barriers.

A positive sign is that the growth is driven not only by private imports but also by interest from companies engaged in taxi and delivery services, which creates potential for local business models based on clean transport.

Charging infrastructure has started to develop but remains highly fragmented, mostly consisting of stand-alone installations without unified networks, standardized payment systems, power levels, or geographic coverage. In the absence of a national roadmap for charging infrastructure development, investment planning and coordination between the state, private sector, and international partners remain challenging.

Considering the share of the plan achieved and the projected emission reductions from replacing 10,800 ICE vehicles with EVs (an indicative 54.42 kt $CO_2$ eq. annually), the estimated achieved reductions amount to 34.56 kt $CO_2$ eq. per year. This preliminary reduction is assessed as significant, particularly in the absence of substantial subsidies or fiscal incentives.

It is recommended to adopt a National Plan for Electric Transport Development with concrete targets, milestones, and support mechanisms is recommended, as well as the introduction of fiscal and non-fiscal incentives such as reduced customs duties, tax exemptions, free parking, and priority access to roads.

*Calculation of GHG emmisions reductions*. Inputs from GACMO and assumptions: Mileage: 22,515 km/car·year, Promotank research. Gasoline cars: 9.9 km/l, liters/car = 22,515 / 9.9 = 2,274 l/year. Gasoline emission factor: 1,000 l = 33.2 GJ. And the emission coefficient = 69.3 kg $CO_2$/GJ = 2.30076 kg $CO_2$/l.

Gasoline emissions/car = 2,274 × 2.30076 ≈ 5.23 t $CO_2$/year. For 1,000 cars, this is ≈ 5,247 t $CO_2$/year (as in the GACMO table). Electric vehicles: 9.0 km/kWh → kWh/car = 22,515 / 9 ≈ 2,502 kWh = 2.502 MWh/year. Grid emission factor: 0.13 t $CO_2$/MWh. EM emissions/car = 2.502 × 0.13 ≈ 0.325 t $CO_2$/year. For 1,000 electric vehicles, the GACMO model shows ≈ 313 t $CO_2$/year. Reduction per 1,000 vehicles: 5,247 − 313 ≈ 4,934 t $CO_2$/year or 4,934 t/vehicle per year. Scaling up to our fleet of 7,000 electric vehicles: 4,934 × 7,000 ≈ 34,558 t $CO_2$/year ≈ 34.56 kt.

**Measure 2.3.2. Expansion of public electric transport with replacement of ICE driven buses and establishment of charging station networks.**

The replacement of diesel-powered public transport with electric buses is among the most effective mitigation measures in the urban transport sector. Electric buses produce zero direct GHG emissions during operation, which is particularly important in the context of high traffic density and poor air quality in urban areas of the Kyrgyz Republic. Beyond environmental benefits, the transition to electric transport reduces dependence on imported petroleum products and fosters a climate-neutral urban mobility model.

Under the National NDC Implementation Plan for 2025, the target indicator was the replacement of 135 diesel buses with electric buses. Additionally, under a project supported by the European Bank for Reconstruction and Development, the city of Osh acquired 23 “Trolza” trolleybuses. This step is consistent with the goal of expanding the share of electric transport in urban mobility and demonstrates regional engagement in decarbonization efforts.

In parallel with procurement of electric vehicles, the implementation of a charging infrastructure programme has begun. According to the Action Plan, in 2025 it was envisaged to install: (i) 50 charging units with a capacity of 120 kW at depots; and (ii) 35 charging units with a capacity of 300 kW at depots.

The development of charging infrastructure is a key factor for the sustainability of the transition to e-buses. Charging stations not only technically enable vehicle operation but also create the basis for scaling up the programme to other regions. The preliminary estimated impact of this measure is 6.84 kt $CO_2$ eq. in 2025.

*Recommendation:* For long-term sustainable outcomes, it is necessary to: (i) institutionalize the electric transport development programme at the national level; and (ii) integrate charging infrastructure into the urban environment.

*Calculation of GHG emmisions reductions*. OECD project methodology: GHG emission reductions are based on a model for optimizing investment costs in public transport (OPTIC) created on the basis of spreadsheets prepared by the OECD to support the Kyrgyz government in preparing and accurately assessing the costs and environmental benefits of implementing the Environmentally Friendly Public Transport Program (EFPT) for Kyrgyzstan. By 2040, 20 trolleybuses will be delivered to the city of Bishkek to replace 20 diesel-powered buses. According to OPTIC data, the annual mileage for Bishkek is set at 46,000 km. The estimated CO2 emission factors for trolleybuses are 0.3384 kg/km. Diesel buses over 10 years old: 1.2974 kg/km. The trolleybuses will replace the same number of buses with identical capacity running on Euro 2 diesel fuel with a service life of over 10 years.

The reduction in emissions per year for one trolleybus will be: 46,000 × (1.2974-0.3384) = 44,114 kg CO2e or 44.1 tons or 0.0441 kt. Total reduction for 20 trolleybuses: 20 × 0.044 kt = 0.88 kt CO2e. Total reduction from 135 electric buses: emission factor from electric buses = 0.3384 CO2e kg/km. 135 × 0.044114 kt = 5.95 kt CO2e. Total reduction from trolleybuses and electric buses in 2025: 5.96 + 0.88 = 6.84 kt CO2eq.

**Measures 2.4.1–2.4.3. Replacement of petrol and diesel fueled buses with compressed natural gas (CNG)-powered buses.**

The replacement of outdated diesel buses with internal combustion engines (Euro-2 and below) by buses powered by compressed natural gas (CNG) represents a structural climate measure with high mitigation potential. In urban settings with polluted air, dense traffic, and an aging bus fleet, this measure simultaneously aims to reduce GHG emissions, improve air quality, and decrease reliance on liquid fossil fuels.

CNG buses emit significantly less $CO_2$ compared to diesel counterparts for the same transport service. This results from: (a) the lower carbon content of methane compared to diesel; (b) higher fuel efficiency of modern gas engines; and (c) reduced emissions of black carbon and particulate matter, especially in urban conditions.

Moreover, the shift to CNG allows for quicker short-term climate benefits, in contrast to more capital-intensive and longer-term measures such as full fleet electrification, and can be rapidly scaled in major cities and suburban areas. In Bishkek, 1,337 new CNG buses were procured and put into operation, resulting in estimated GHG emission reductions of 10.72 kt $CO_2$ eq. per year.

*Calculation of GHG emmisions reductions.* According to OPTIC data, the annual mileage for Bishkek is set at 46,000 km. First stage in 2025: Replacement of 400 diesel buses and 60 buses. The emission factor for diesel-powered cars is 1.297 kg CO2e/km. The emission factor for gas-powered buses is 0.935 kg CO2e/km. The emission factor for diesel-powered minibuses is 1.406 kg CO2e/km.

Reduction in GHG emissions from converting all buses to CNG – (1.297 - 0.935) × 400 × 46,000 = 6,668,160 kg = 6.668 kt CO2e. Reduction from replacing all minibuses with CNG – (1.4056-0.935) × 60 × 46,000 = 1,298,856 kg = 1.299 kt CO2e.

With OECD project: by 2040, 200 buses and 50 minibuses running on diesel in Osh will be replaced with buses running on compressed CNG (Compressed Natural Gas). According to OPTIC data, the annual mileage is set at 46,000 km. The first stage in 2025 involves replacing 100 diesel buses and 50 minibuses. Reduction in GHG emissions after replacing all diesel buses with CNG buses – (1.297 - 0.935) × 100 × 46,000 = 1,667,040 kg = 1.67 kt CO2eq. Reduction from replacing all minibuses with CNG buses: kg CO2eq – (1.406-0.935) × 50 = 1,082,380 = 1.08 kt CO2eq. Reduction from replacing all of the above = 2.749 kt CO2eq/year

**Measure 2.4.4. Eco-driving and vehicle maintenance.**

In 2025, this measure was expected to achieve 20.73 kt $CO_2$ eq. in GHG emission reductions. However, the training of drivers did not take place due to the lack of modern training facilities, and resources for international support to implement this measure could not be mobilized.

## 2.4.3 Industrial Processes and Product Use

### *2.4.3.1. Mitigation policies and measures in the IPPU sector*

Out of the five conditional measures included in NDC-2 for the IPPU sector, four measures of a regulatory and institutional nature were classified as unconditional, and only one had a direct mitigation effect: the development of biogas units (BGPPs) on food industry waste. Since the biogas was envisaged for energy purposes, the related emission reductions are accounted for in the Energy sector – see Table 2.17, Measure 1.7.4.

As the NDC Implementation Plan was not officially adopted by the Government of the Kyrgyz Republic, the relevant ministries and agencies did not include NDC WAM measures in their sectoral workplans[225]. Therefore, as of 2023, no measures in the IPPU sector had been implemented. Table 2.21 presents the institutional arrangements.

*Table 2.21. Institutional arrangements for the implementation of measures in the Energy and IPPU sectors*

| № | Policies and Measures | Responsible Government Agencies and Partners |
|---|---|---|
| **Policy 1. Reduction of GHG emissions in the Energy sector** | | |
| **Conditional measures (WAM)** | | |
| **Objective 1.7. Development of RES** | | |
| **1.7.4** | Installation of BPPs in the food industry | Food industry enterprises, investors |

### *2.4.3.2 Recommendations for improvement*

The structure of the sector in terms of GHG emissions provides limited scope for planning measures with direct mitigation effects. The IPPU sector has two key categories: cement production and use of ozone-depleting substance (ODS) substitutes, primarily hydrofluorocarbons (HFCs).

The general needs of the Kyrgyz Republic's economic development in recent years require increasing volumes of cement, which are being met through new cement plants. For example, in 2024, the Terek-Tash cement plant (LLC), with a design capacity of 1,300,000 tons of clinker, was commissioned in Chui region. In the coming years, this industry is expected to continue expanding.

Regarding the second key category, no direct mitigation measures have yet been introduced, since Kyrgyzstan does not produce HFCs. The entire volume consumed is imported as part of industrial and household equipment. Imports of refrigeration and air-conditioning equipment have been steadily increasing. Introducing regulation in this area makes it difficult to achieve predictable effects, as Kyrgyzstan is fully dependent on global manufacturers. Tangible results can only be expected once sufficient supply of equipment with lower Global Warming Potential (GWP) HFCs or alternative refrigerants becomes available on the market.

Nevertheless, the Kyrgyz Republic has undertaken commitments to phase out HFCs by signing the Kigali Amendment to the Montreal Protocol in 2020. According to these commitments, Kyrgyzstan must gradually reduce the use of HFCs according to the following schedule:

- 2020–2023: no restrictions
- 2024–2028: freeze HFC use at baseline levels of the previous period

[225] This affected the implementation of the NDC across all sectors. The situation changed with the official adoption of the "Concept for Achieving Carbon Neutrality by 2050," Resolution of the Cabinet of Ministers No. 397 of 3 July 2025.

- 2029–2034: reduce HFC use by 10% from the baseline period
- 2035–2039: reduce HFC use by 30% from the baseline period
- 2040–2044: reduce HFC use by 50% from the baseline period
- 2045 and beyond: reduce HFC use by 80% from the baseline period

Given the significant share of emissions from HFCs, compliance with the HFC phase-down obligations will have a substantial mitigation effect, expected to become evident in the medium term (post-2028), and will partially offset the growth of emissions from the cement industry. Therefore, in the next NDC, the main efforts should be directed towards the gradual phase-out of HFCs.

## 2.4.4 Agriculture

### *2.4.4.1 Mitigation Policies and Measures in the Agriculture Sector*

In this sector of the Nationally Determined Contribution, two mitigation policies were envisaged: one — 3.1 Development of Organic Farming — was classified under the With Measures Scenario, while the other — 3.2 Improvement of Livestock Productivity — was assigned to the With Additional Measures Scenario (see Table 2.23). The institutional framework for the implementation of these measures is presented in Table 2.22.

#### *2.4.4.1.1 Institutional Framework for the Implementation of Mitigation Policies and Measures in the Agriculture Sector*

*Table 2.22. Institutional framework for the implementation of measures in the Agriculture Sector under the two scenarios*

| № | Policies and Measures | Responsible Government Agencies and Partners |
|---|---|---|
| **Policy 3. Reduction of Greenhouse Gas (GHG) Emissions in the Agriculture Sector** | | |
| **Unconditional mitigation policies and measures under the WM scenario** | | |
| **Objective 3.1. Development of Organic Farming** | | |
| **3.1.1** | Expansion of arable land areas under organic farming | Ministry of Water Resources, Agriculture and Processing Industry (MWRAPI), EcoAgro, Foundation for Organic Development (FOD), farmers |
| **Measures subject to international support under the WAM scenario** | | |
| **Objective 3.2. Improvement of Livestock Productivity** | | |
| **3.2.1** | Breeding of highly productive livestock species to reduce the total livestock population | Ministry of Economy and Commerce , Ministry of Water Resources, Agriculture and Processing Industry, private companies, farmers |

#### *2.4.4.1.2 Conditional and Unconditional Policies and Measures in the Agriculture Sector*

Table 2.23 presents the target indicators of mitigation policies and measures.

*Table 2.23. Mitigation measures in the Agriculture Sector under the two scenarios.*

| № | Policies and Measures | Indicators | Target Values | | | Progress (2025) |
|---|---|---|---|---|---|---|

| | | | | Implementation Period (years) | Expected Reductions, kt $CO_2$ eq. | Performance Indicators | Mitigation Indicators, kt $CO_2$ eq. |
|---|---|---|---|---|---|---|---|
| **Policy 3. Reduction of Greenhouse Gas (GHG) Emissions in the Agriculture Sector** | | | | | | | |
| **Unconditional Mitigation Policies and Measures** | | | | | | | |
| ***Objective 3.1. Development of Organic Farming*** | | | | | | | |
| **3.1.1** | Expansion of arable land areas under organic farming | Arable land area under organic farming | 38,065 ha by 2025; 57,083 ha by 2030 | 2023-2030 | 2025 – 103.016; 2030 – 211.375 | 65,850.52 ha | 94.853 |
| **Measures Subject to International Support (With Additional Measures Scenario, WAM)** | | | | | | | |
| ***Objective 3.2. Improvement of Livestock Productivity*** | | | | | | | |
| **3.2.1** | Breeding of highly productive livestock species to reduce the total livestock population | Reduction of low-productivity livestock population | 2% by 2025; 5% by 2030 | 2023–2030 | 2025 – 30.822; 2030 – 83.706 | Not achieved (see details below) | Not assessed |

### *2.4.4.1.3 Implementation of Policies and Measures in the Agriculture Sector*

When considering reductions, it should be taken into account that, in the current inventory, a transition has been made from the Global Warming Potentials of greenhouse gases under the Second Assessment Report of the Intergovernmental Panel on Climate Change (IPCC AR2) to the GWPs of the Fifth Assessment Report on climate change. Furthermore, the target indicators specified in the Nationally Determined Contribution are set for 2025 and 2030, whereas the intermediate results are assessed in the present report as of the end of 2023.

***Unconditional mitigation measure 3.1.1: "Expansion of arable land areas under organic farming."***

The implementation of this measure has exceeded the target indicators established in the NDC, both in terms of the area of arable land converted to organic farming and the reduction of nitrous oxide emissions. The calculation of reductions presented in Table 2.21 was carried out using a Global Warming Potential (GWP) for $N_2O$ of 265. When applying a GWP for $N_2O$ of 310 (the value used in the preparation of the NDC), the reduction amounts to 110.960 thousand tonnes of $CO_2$ equivalent.

*Calculation of GHG emmisions reductions.* When developing NDC 2 calculation of GHG emissions reduction include the following steps:

1. Extimation of emissions form category "Direct $N_2O$ emissions form managed soils" as per BAU scenario (linear trend for the perios 1996-2020), kt $CO_2$ eq.
2. Assumption used: the area of agricultural land is a constant value (1 287 800 ha).
3. The projection of nitrogen fertilizers was made recalculating N (based on actual imports in 2006-2020).
4. Then, the recalculation of an average norm of the nitrogen fertilizers per 1 ha recalculating N was made (tha value of step 2 ÷ the values of srep3), kg/ha.
5. The selection and calculation of the target area of agricultural land under organic farming was done on an agreement with the Ministry of Agriculture, ha/year (see targer activity indicators in Table 2.23).
6. Calculation of the total area of agricultural land under organic farming (accounting the value of step 5), ha.
7. Recalculation of the agricultural land area, where synthetic nitrogen fertilizers are used (the value of step 2 – the values of step 6), ha.
8. Recalculation of the amount of used nitrogen fertilizers without organic farming area based on the norm of fertilizers per hector (the value of step 4 × the values of step 7), kg.

9. Comparison of the used amounts of synthetic nitrogen fertilizers (the value of step 8 ÷ the value of step 3), %.
10. Recalculation of the projection for category “Direct $N_2O$ emissions from managed soils", with implemented organic farming measure (the value fo step 1 × the value of step 9), kt $CO_2$ eq.

***Conditional mitigation measure 3.2.1: “Breeding of highly productive livestock species to reduce the total livestock population.”***

It is evident that the target indicator for this measure will not be achieved by 2025. The results of calculations assessing the implementation of this measure are presented in Table 2.24.

*Table 2.24. Activity indicators and GHG emission reductions based on the analysis of NDC-2 implementation*

| Activity Indicators | NDC-2 Projection Period | | |
|---|---|---|---|
| | 2021 | 2022 | 2023 |
| 1) Cattle population (NDC: 2017–2020 – NSC data; 2021–2023 – BAU projection) | | | |
| Total cattle | 1,750,467 | 1,718,664 | 1,755,792 |
| Including cows | 868,820 | 855,323 | 871,795 |
| 2) Cattle population if the NDC-2 activity indicator is achieved | | | |
| Total cattle | 1,750,467 | 1,714,387 | 1,747,074 |
| Including cows | 868,820 | 851,046 | 863,077 |
| 3) Actual cattle population (NSC) | | | |
| Total cattle | 1,750,467 | 1,783,469 | 1,802,299 |
| Including cows | 868,820 | 885,673 | 902,244 |
| 4) Increase/Decrease in cattle population, % | | | |
| If the NDC-2 activity indicator of 2% relative to 2021 is achieved | 100% | 99.7% | 99.5% |
| Actual changes relative to 2021 | 100% | 103.7% | 102.6% |
| 5) Emissions from category “3A Livestock”,[226] kt $CO_2$ eq. | | | |
| NDC-2 BAU Scenario (GWP AR2) | 2,876.200 | 2,936.468 | 2,996.736 |
| NDC-2 with implemented measure (GWP AR2) | 2,876.200 | 2,929.161 | 2,981.856 |
| Actual emissions according to BTR-1 (AR5) | 3,715.499 | 3,746.017 | 3,783.694 |

As can be seen from the table, the actual growth rates of the cattle population consistently exceed the projected values under the Business-as-Usual scenario. This trend has persisted up to the current year 2025. The pace of implementation of artificial insemination of cattle with the semen of highly productive breeds, promoted under other state programs, remains insufficient in terms of the objectives and commitments of the NDC. It should be recalled that the full-scale implementation of this measure is feasible only under conditions of international support.

*Calculation of GHG emmisions reductions.*

1. Estimation of GHG emissions from category "3.A.1. Cattle" as per BAU scenatio (линейный тренд на периоде 1996-2020 гг.), кт $CO_2$ экв.
2. Development of the cattle heads’ projection as per BAU, heads.
3. Jointly with the Ministry of Agriculture, the target indicators for the cattle number reduction were developed, accounting improved breeds, in percentage of the cattles (see Table 2.23), %.

[226] Since the IPCC category classification was used at the time of the NDC development, the inventory data of the BUR1 are presented according to this classification for comparison purposes.

4. Catlle reduction projections after the implementation of the measure, heads (the value of step 2 × (1- the values of step 3)).
5. Emissions from "3.A.1. Cattle" category minus projections with the implemented measure, kt $CO_2$ eq. (the value of step 1 × the value of step 4 ÷ the values of step 2).

#### *2.4.4.2 Recommendations for Improvement*

As already noted, with the adoption of the Concept for Achieving Carbon Neutrality by 2050, for which the implementation plan up to 2030 was set out in NDC-2, a political and normative legal foundation has been established for the Kyrgyz Republic to fulfill its commitments under the Paris Agreement (PA). During the current year, the draft Law on Climate Action is expected to be considered. The adoption of these documents will significantly facilitate the mobilization of domestic resources, as well as the identification and attraction of additional external resources for the implementation of measures under both scenarios.

### 2.4.5 Land Use, Land-Use Change and Forestry (LULUCF)

#### *2.4.5.1 Institutional Framework for the Implementation of NDC Policies and Measures in the LULUCF Sector*

The institutional framework for the implementation of mitigation measures under the NDC in the Land Use, Land-Use Change and Forestry sector is presented in Table 2.25.

*Table 2.25.Institutions responsible for the implementation of mitigation measures in the LULUCF sector under the two scenarios*

| № | Policies and Measures | Responsible Government Agencies and Partners |
|---|---|---|
| **Policy 4. Enhancement of Carbon Sequestration in the LULUCF Sector** | | |
| **Unconditional mitigation policies and measures** | | |
| **Objective 4.1. Preservation of carbon stocks through the conservation of existing forests** | | |
| **4.1.1.** | Strengthening forest protection against forest violations | FS of MES, MNRETS, LSGBs |
| **Objective 4.2. Enhancement of carbon stocks through forest expansion** | | |
| **4.2.1.** | Reforestation and afforestation | FS of MES, MNRETS, LSGBs |
| **Objective 4.3. Preservation of carbon stocks through the conservation of existing perennial plantations** | | |
| **1.3.1.** | Protection and promotion of the growth of perennial plantations | LSGBs, private sector |
| **Measures subject to international support (WAM scenario)** | | |
| **Objective 4.4. Enhancement of carbon stocks through the expansion of perennial plantations** | | |
| **4.4.3.** | Establishment of new perennial plantations (fruit orchards, tree plantations, parks) | FS of MES, private sector |

#### *2.4.5.2 Conditional and Unconditional Policies and Measures in the LULUCF Sector*

In this sector of the Nationally Determined Contribution, three direct mitigation measures were envisaged under the *With Measures* scenario and one under the *With Additional Measures* scenario (see Table 2.26).

*Table 2.26. Mitigation measures in the LULUCF sector under the two scenarios*

| № | Mitigation Policies and Measures | Indicators | Target Values by 2025 | Indicative Implementation Period | Carbon Sequestration, kt $CO_2$ eq. | Progress Achieved | |
|---|---|---|---|---|---|---|---|
| | | | | | | Performance Indicators | Mitigation Indicators, kt $CO_2$ eq. |
| **Policy 4. Enhancement of Carbon Sequestration in the LULUCF Sector** | | | | | | | |
| **Unconditional mitigation policies and measures (WM)** | | | | | | | |
| **Objective 4.1. Preservation of carbon stocks through the conservation of existing forests** | | | | | | | |
| **4.1.1.** | Conservation of the area of existing forests | Forest area under protection against forest violations and support for natural regeneration | 1,229 thousand ha | 2021–2030 | 2025 – 7,581.8; 2030 – 7,691.2 | 1,273.1 thousand ha | – 8,213.6 |
| **Objective 4.2. Enhancement of carbon stocks through forest expansion** | | | | | | | |
| **4.2.1.** | Increase in forest-covered area | Area of newly established forest plantations | 32 thousand ha | 2021–2030 | 2025 – 199.561; 2030 – 311.771 | 44 thousand ha | – 8,213.6 |
| **Objective 4.3. Preservation of carbon stocks through the conservation of existing perennial plantations** | | | | | | | |
| **4.3.1.** | Protection and promotion of the growth of perennial plantations | Area of perennial plantations | 14 thousand ha | 2021–2030 | 2025 – 3,516.3; 2030 – 3,530.5 | 1.8 thousand ha | – 2,095.5 |
| **Conditional mitigation policies and measures (WAM)** | | | | | | | |
| **Objective 4.4. Enhancement of carbon stocks through the expansion of perennial plantations** | | | | | | | |
| **4.4.1.** | Establishment of new perennial plantations (fruit orchards, tree plantations, etc.) | Area of perennial plantations in the private sector (fruit and other crops) | 500 ha | 2021–2030 | 2025 – 3.5; 2030 – 3.5 | 500 ha | – 3.5 |

### *2.4.5.3 Implementation of Unconditional Policies and Measures in the LULUCF Sector*

Under NDC-2, the following mitigation policies in the Land Use, Land-Use Change and Forestry sector were envisaged:

4.1. Preservation of carbon stocks through the conservation of existing forests
4.2. Enhancement of carbon stocks through forest expansion
4.3. Preservation of carbon stocks through the conservation of existing perennial plantations

***Mitigation measure 4.1.1. Protection and promotion of natural carbon stock growth in existing forests.***

According to the 2018 Forest Fund inventory, the forest-covered area amounted to 1,206.7 thousand ha. To determine the future dynamics of forest area, global land cover change data were analyzed. An assessment based on Remote Sensing (RS) data of the Global Climate Observing System (GCOS) showed that between 1992 and 2018, forest-covered areas increased by approximately 90 thousand ha. Based on this analysis, the projected dynamics of forest expansion were established, according to which the total area was expected to reach 1,229 thousand ha by 2025.

The projected increase was expected to result from: a) strengthening forest protection, including the facilitation of natural regeneration, and b) improving forest accounting and forest management systems, which would involve clarifying forest areas during forest inventory works.

Thus, an increase in forest area of 23 thousand ha was projected by 2025, and net carbon sequestration was expected to reach 7,581.8 kt $CO_2$. However, actual data exceeded the projected values. According to the 2023 Forest Fund inventory, the forest-covered area amounted to 1,273.1 thousand ha, compared with the

expected 1,229 thousand ha. Consequently, net sequestration was also higher – according to the National Greenhouse Gas Inventory in the BTR-1, it reached 8,213.6 kt $CO_2$ in 2023, exceeding the expected value by 631.8 kt $CO_2$.

***Mitigation measure 4.2.1. Increase in forest-covered area.***

In the analysis of mitigation measures incorporated in the country's strategic development documents (the *National Development Strategy of the Kyrgyz Republic*, the *Concept for the Development of the Forestry Sector*, and the *Concept of Green Economy*), it was determined through calculations that, with the implementation of these measures, forest-covered areas would increase by 83 thousand ha by 2040.

According to data of the Forest Service (FS) of the Ministry of Emergency Situations (MES) and the Ministry of Natural Resources, Ecology and Technical Supervision (MNRETS), more than 24.25 thousand ha of forest plantations were established between 2017 and 2024. In addition, during the same period, forest plantations of older age groups were reclassified as forest-covered areas on a total area exceeding 3.46 thousand ha (see Table 2.27). Since the results of new plantations are not immediately included in the calculation methodology of the Intergovernmental Panel on Climate Change (IPCC), the increase in GHG sequestration due to reclassification into forest-covered areas amounted to 22.3 kt $CO_2$ eq.

*Table 2.27. Indicators of afforestation and reforestation for the period 2017–2025.*

| Indicators | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| Afforestation and reforestation, ha | 1,563.7 | 1,448 | 1,977 | 1,399 | 694 | 4,223.5 | 5,077.8 | 5,774.2 | 2,093.7 | 24,250.9 |
| Reclassification into forest-covered areas, ha | 410.3 | 451.4 | 297 | 215.2 | 243.9 | 860.6 | 583.5 | 398.1 | N/A* | 3,460 |

Note: N/A – not assessed. Data on reclassification of land into forest-covered areas for 2025 are not yet available.

It had been projected that by 2025, the forest-covered area would reach 1,261 thousand ha, and net sequestration – 7,781.4 kt $CO_2$. As already noted above, according to 2023 data, net sequestration by forests reached 8,213.6 kt $CO_2$, while the forest-covered area amounted to 1,273.1 thousand ha. Thus, the target indicators for Objectives 4.1 and 4.2 have been fully achieved.

***Mitigation Measure 4.3.1. Protection and Promotion of the Growth of Perennial Plantations.***

Taking into account the minor but stable increase in the area of perennial plantations during 2006–2017, the forecast of sequestration volumes was calculated using the linear equation of the statistical Excel FORECAST function. The projection assumed that by 2025:

- the area of perennial plantations would increase by 14 thousand ha;
- carbon sequestration by perennial plantations would amount to 3,516.3 kt $CO_2$.

However, according to land reports for the period 2017–2024, the actual increase amounted to only 1.8 thousand ha, and, accordingly, sequestration reached 452.096 kt $CO_2$. In addition, according to the National Greenhouse Gas Inventory (NGHGI) for 1990–2023, the volumes of sequestration by perennial plantations on cultivated lands and pastures turned out to be significantly lower than projected due to recalculations. Therefore, the targets under Objective 4.3 may be considered only partially achieved.

### *2.4.5.4 mplementation of Conditional Policies and Measures in the LULUCF Sector*

***Mitigation measure 4.4.1. Establishment of new perennial plantations (fruit orchards, tree plantations).***

When developing projections in the sector, it was expected that the Law of the Kyrgyz Republic "On Amendments to Certain Legislative Acts of the Kyrgyz Republic (to the Land Code, the Law of the Kyrgyz Republic 'On Pastures,' the Code of the Kyrgyz Republic on Administrative Liability, the Law of the Kyrgyz Republic 'On Local Self-Government,' the Law of the Kyrgyz Republic 'On Local State Administration,' and the Law of the Kyrgyz Republic 'On Land Use Transformation') would be adopted.

It was assumed that the adoption of these amendments would create favorable legal conditions for converting low-productive lands (pastures) into orchards. It was projected that, following the adoption of the law, 500 ha of low-productive pastures would be converted to horticulture, ensuring additional sequestration of 3.5 kt $CO_2$.

The expected amendments were adopted in 2022 and 2023:

- Law of the Kyrgyz Republic of 5 August 2022 "On Amendments to Certain Legislative Acts of the Kyrgyz Republic (to the Land Code, the Law of the Kyrgyz Republic 'On Pastures'),"
- Resolution of the Cabinet of Ministers of the Kyrgyz Republic No. 26 of 21 January 2023 "On Amendments to Government Resolution of the Kyrgyz Republic No. 243 of 22 June 2007 'On the Model Regulation on the Conditions and Procedure for Leasing Land of the State Fund of Agricultural Lands.'"

The adoption of the above-mentioned normative legal acts laid the foundation for the development of horticulture and viticulture, which became a major achievement in land use policy for the further advancement of the fruit-growing sector in the country. Since 2020, active work has been carried out to identify low-productive lands, as a result of which more than 600 thousand ha were identified. Following the adoption of the relevant amendments to legislation, in 2024 the **Programme for the Development of Horticulture and Viticulture of the Kyrgyz Republic for 2025–2029** was developed and approved by Resolution of the Cabinet of Ministers of the Kyrgyz Republic No. 633-r of 14 October 2024.

Thus, it may be considered that all necessary legal frameworks and conditions for the implementation of Objective 4.4 have been established. According to preliminary data, more than 750 ha of low-productive pastures have already been converted (change of designated use). Therefore, the activity target under Objective 4.4 may be regarded as achieved.

### 2.4.6. Waste

In the Waste sector, the NDC did not envisage direct mitigation measures. However, measures related to the construction of Biogas Power Plants (BGPPs), the emission reductions from which are accounted under the "Energy" sector, are planned to be implemented by stakeholders in the Waste sector under conditions of international support. Other measures in this sector were of an institutional and regulatory nature.

Table 2.28 presents the institutional framework for the implementation of these measures.

*Table 2.28. Institutional framework for the implementation of measures in the Energy and Waste sectors*

| № | Policies and Measures | Responsible Government Agencies and Partners |
|---|---|---|
| **Policy 1. Reduction of GHG emissions in the Energy Sector** | | |
| **Measures subject to international support (WAM scenario)** | | |
| **Objective 1.7. Development of Renewable Energy Sources (RES)** | | |

| № | Policies and Measures | Responsible Government Agencies and Partners |
|---|---|---|
| **1.7.2** | Installation of Biogas Power Plants (BGPPs) at sanitary landfills in Bishkek and Osh | Ministry of Energy (MoE), municipal administrations of Bishkek and Osh, Municipal Enterprises (MEs) – sanitary landfills |
| **1.7.3** | Installation of BGPPs at wastewater treatment plants in Bishkek and Osh | MoE, municipal administrations of Bishkek and Osh, MEs – city water utilities |

As noted, during the reporting period it was not possible to mobilize resources for the construction of Biogas Power Plnts (BGPPs).

Despite the mitigation potential envisaged in NDC-2.0 for the Waste sector, as of 2023 the implementation of planned GHG emission reduction measures rtmains at the stage of preliminary planning and has not advanced to the phase of practical execution. The developed emission scenarios, in particular the *With Additional Measures (WAM)* scenario, currently retain the status of model assumptions and do not reflect the actual trajectory of emission reductions in the Waste sector. This situation highlights the need to: update the list of mitigation measures, taking into account their realism and practical feasibility; strengthen institutional and financial capacities of the sector; introduce pilot projects on the utilization of organic waste.

The insufficient progress in the implementation of planned mitigation measures indicates the necessity of revising approaches to planning, financing and institutional support. The absence of a sustainable system for organic waste management, weak infrastructure development, limited resources at the local level, and insufficient intersectoral coordination hinder the achievement of the objectives set out in NDC-2.0.

## 2.5 Assessment of GHG Emission Reductions

Based on the data received from stakeholders across various sectors, an assessment of progress in achieving the NDC targets was carried out. Calculations of GHG emission reductions were performed, and the results are presented in Table 2.29.

*Table 2.29. GHG emission reductions by sector and types of mitigation policies and measures*

| Sector | Policies and Measures | Reductions, kt $CO_2$ eq. |
|---|---|---|
| **Energy** | Unconditional (WM scenario) | 46.64 |
| | Conditional (WAM scenario) | 59.357 |
| | **Total** | **105.999** |
| **Transport** | Unconditional (WM scenario) | 119.000 |
| | Conditional (WAM scenario) | 52.114 |
| | **Total** | **171.114** |
| **Agriculture** | Unconditional (WM scenario) | 94.853 |
| | Conditional (WAM scenario) | 0 |
| | **Total** | **94.853** |
| **LULUCF** | Unconditional (WM scenario) | 1,106.196 |
| | Conditional (WAM scenario) | 3.500 |
| | **Total** | **1,109.696** |
| **Total, kt $CO_2$ eq.** | Unconditional (WM scenario) | 1,366.689 |
| | Conditional (WAM scenario) | 114.973 |
| | **Total** | **1,481.661** |
| **Total, % of net GHG emissions in 2023** | Unconditional (WM scenario) | 15.1% |
| | Conditional (WAM scenario) | 1.3% |
| | **Total** | **16.3%** |

### 2.5.1 Methodology for Assessing GHG Emission Reductions

Presentation of the methodology to estimate GHG reductions and removals increase by the measures of NDC 2 has been given above in section 2.4 describing mitigation policy and measures.

Unfortunately, the data on activities aimed at reducing greenhouse gas (GHG) emissions and the information available at the time of preparation of the First Biennial Transparency Report (BTR-1) do not appear to fully reflect all efforts of the Kyrgyz Republic in this area. This is due both to the lack of data and technical capacity in certain sectors, as well as to insufficient financial resources for conducting more comprehensive research. Therefore, the following provides limited information on the methodology for calculating GHG emission reductions, in accordance with paragraph 85 of the Modalities, Procedures and Guidelines (MPGs).

The values of GHG emission reductions by sector were derived on the basis of the results of the National Greenhouse Gas Inventory (NGHGI) for 1990–2023, which was prepared in full compliance with the 2006 IPCC Guidelines for National Greenhouse Gas Inventories.

Reductions in the Energy sector were calculated using data from the National Inventory of GHG Emissions and Removals and the derived values of reduced electricity and heat consumption, applying the grid emission factor of the Kyrgyz Republic.

Reductions in the Transport sector were calculated on the basis of data from the National Inventory of GHG Emissions and Removals and the estimated reduction in fuel consumption, using the Greenhouse Gas Abatement Cost Model (GACMO) with factors adapted for the Kyrgyz Republic.

Reductions in the Agriculture sector were calculated using data from the National Inventory of GHG Emissions and Removals and data on the reduction of the use of inorganic nitrogen fertilizers.

Reductions in the Land Use, Land-Use Change and Forestry (LULUCF) sector were calculated using data from the National Inventory of GHG Emissions and Removals and information on the expansion of forest areas and perennial plantations.

## 2.6 Summary of GHG Emissions and Removals

The summary assessment of greenhouse gas (GHG) emissions in the Kyrgyz Republic, obtained as a result of the National Greenhouse Gas Inventory (NGHGI) for 1990–2023, is presented below (Table 2.30, as well as in Table 10 of the Common Reporting Tables (CRT) and Table 6 of the Common Tabular Formats (CTF)), by types of direct GHGs and by source categories for 2021–2023.

*Table 2.30. Summary of GHG emissions and removals according to overall reporting Table 10 "Emission Trends Summary" (CTF Table 6)*

| GHG Emissions and Removals | Base Year 1990 | 2017 | 2021 | 2022 | 2023 | Change from Base Year to Last Reporting Year |
|---|---|---|---|---|---|---|
| | | | kt $CO_2$ eq. | | | % |
| $CO_2$ emissions excluding LULUCF | 20 310,36 | 9 915,82 | 11 164,33 | 11 376,22 | 11 284,78 | -44,44 |
| $CO_2$ emissions including LULUCF | 10 670,38 | -299,58 | 861,49 | 1 081,00 | 975,58 | -90,86 |
| $CH_4$ emissions excluding $CH_4$ from LULUCF | 5 040,22 | 4 678,39 | 5 311,72 | 5 447,70 | 5 611,58 | 11,34 |
| $CH_4$ emissions including $CH_4$ from LULUCF | 5 040,23 | 4 678,52 | 5 311,74 | 5 449,05 | 5 611,79 | 11,34 |
| $N_2O$ emissions excluding $N_2O$ from LULUCF | 2 548,39 | 1 297,44 | 1 855,25 | 1 769,88 | 1 951,69 | -23,41 |
| $N_2O$ emissions including $N_2O$ from LULUCF | 2 548,39 | 1 297,51 | 1 855,26 | 1 770,59 | 1 951,80 | -23,41 |
| HFCs | NE | 562,61 | 430,21 | 481,59 | 526,11 | – |
| PFCs | NO | NO | NO | NO | NO | – |
| Mixtures of HFCs and PFCs | NO | NO | NO | NO | NO | – |
| $SF_6$ | NO | NO | NO | NO | NO | – |
| $NF_3$ | NO | NO | NO | NO | NO | – |
| **Total (excluding LULUCF)** | **27 898,97** | **16 454,25** | **18 761,50** | **19 075,40** | **19 374,16** | **-30,55** |
| **Total (including LULUCF)** | **18 259,00** | **6 239,06** | **8 458,70** | **8 782,23** | **9 065,27** | **-50,34** |

| GHG Emissions and Removals | Base Year 1990 | 2017 | 2021 | 2022 | 2023 | Change from Base Year to Last Reporting Year |
|---|---|---|---|---|---|---|
| | kt $CO_2$ eq. | | | | | % |
| **Total (excluding LULUCF, with indirect)** | **27 898,97** | **16 454,25** | **18 761,50** | **19 075,40** | **19 374,16** | **-30,55** |
| **Total (including LULUCF and indirect)** | **18 259,00** | **6 239,06** | **8 458,70** | **8 782,23** | **9 065,27** | **-50,34** |
| 1. Energy | 20 794,91 | 9662,52 | 10573,98 | 10672,88 | 10651,90 | -48,78 |
| 2. Industrial Processes and Product Use (IPPU) | 871,64 | 1299,16 | 1733,06 | 1981,30 | 2008,04 | 130,38 |
| 3. Agriculture | 5 746,39 | 4795,03 | 5595,44 | 5523,02 | 5754,41 | 0,14 |
| 4. LULUCF | -9 639,98 | -10215,20 | -10302,80 | -10293,17 | -10308,89 | 6,94 |
| 5. Waste | 486,04 | 697,55 | 859,02 | 898,20 | 959,80 | 97,47 |
| 6. Other | NO | NO | NO | NO | NO | NO |
| **Total (including LULUCF)** | **18 259,00** | **6 239,06** | **8 458,70** | **8 782,23** | **9 065,27** | **-50,34** |
| **Total (excluding LULUCF)** | **27 898,97** | **16 454,25** | **18 761,50** | **19 075,40** | **19 374,16** | **-30,55** |

## 2.7 Projections of Greenhouse Gas Emissions and Removals

To determine the values of net emissions in the target years 2025 and 2030, NDC-2, submitted in 2021, applied projections based on 2017 as the baseline year, which was used as a reference point in defining the baseline for its objectives. The Kyrgyz Republic thereby committed to reducing emissions and increasing removals relative to the projected baseline of the Business-as-Usual (BAU) scenario, which was developed on the basis of the results of the National Greenhouse Gas Inventory (NGHGI) for the period 1990–2017, using the Global Warming Potentials (GWPs) from the Second Assessment Report (AR2) of the Intergovernmental Panel on Climate Change (IPCC).

In the course of the NGHGI for the period 1990–2023, GHG emissions and removals were recalculated using the GWPs of the Fifth Assessment Report (AR5) of the IPCC, and accordingly, new projections up to 2035 were developed.

Table 2.30 and Figure 2.36 present the values of GHG emissions under the BAU baseline projections of 2021, as well as the values of projected net GHG emissions up to 2035, based on the recalculations conducted in 2025.

*Table 2.31. Comparison of baseline projections of net GHG emissions (2021 and 2025) and actual emissions.*

| Year | Net Emissions Projections 2021 | Net Emissions according to NGHGI 1990–2023 | Difference between 2021 Projections and NGHGI 1990–2023 | Net Emissions Projections 2025 | Difference between 2021 and 2025 Projections |
|---|---|---|---|---|---|
| | kt $CO_2$ eq. | | % | kt $CO_2$ eq. | % |
| **2017** | 5 500,73 | 6 239,06 | 13,4 | | |

| Year | Net Emissions Projections 2021 | Net Emissions according to NGHGI 1990–2023 | Difference between 2021 Projections and NGHGI 1990–2023 | Net Emissions Projections 2025 | Difference between 2021 and 2025 Projections |
|---|---|---|---|---|---|
| | kt $CO_2$ eq. | | % | kt $CO_2$ eq. | % |
| **2018** | 5 777,15 | 8 030,10 | 39,0 | | |
| **2019** | 6 313,60 | 6 283,03 | -0,5 | | |
| **2020** | 3 807,21 | 6 534,14 | 71,6 | | |
| **2021** | 5 232,96 | 8 458,70 | 61,6 | | |
| **2022** | 6 218,04 | 8 782,23 | 41,2 | | |
| **2023** | 7 231,26 | 9 065,27 | 25,4 | | |
| **2024** | 8 144,67 | | | 10580,77 | 29,9 |
| **2025** | 9 082,02 | | | 11828,13 | 30,2 |
| **2026** | 10 070,62 | | | 12984,09 | 28,9 |
| **2027** | 11 311,11 | | | 14158,08 | 25,2 |
| **2028** | 12 604,53 | | | 15352,11 | 21,8 |
| **2029** | 13 728,40 | | | 16559,42 | 20,6 |
| **2030** | 14 883,89 | | | 17778,09 | 19,4 |
| **2031** | 16 085,69 | | | 19006,04 | 18,2 |
| **2032** | 17 333,74 | | | 20241,99 | 16,8 |
| **2033** | 18 628,23 | | | 21478,92 | 15,3 |
| **2034** | 19 973,26 | | | 22713,93 | 13,7 |
| **2035** | 21 370,38 | | | 23951,58 | 12,1 |
| **2036** | 22 514,25 | | | 25188,58 | 11,9 |
| **2037** | 23 692,15 | | | 26422,82 | 11,5 |
| **2038** | 24 903,05 | | | 27645,98 | 11,0 |
| **2039** | 26 150,49 | | | 28858,08 | 10,4 |
| **2040** | 27 432,93 | | | 30056,15 | 9,6 |

GHG emissions and removals for the period 1990–2023, as well as projections of future emissions by sector up to 2040, are presented in Figure 2.36.

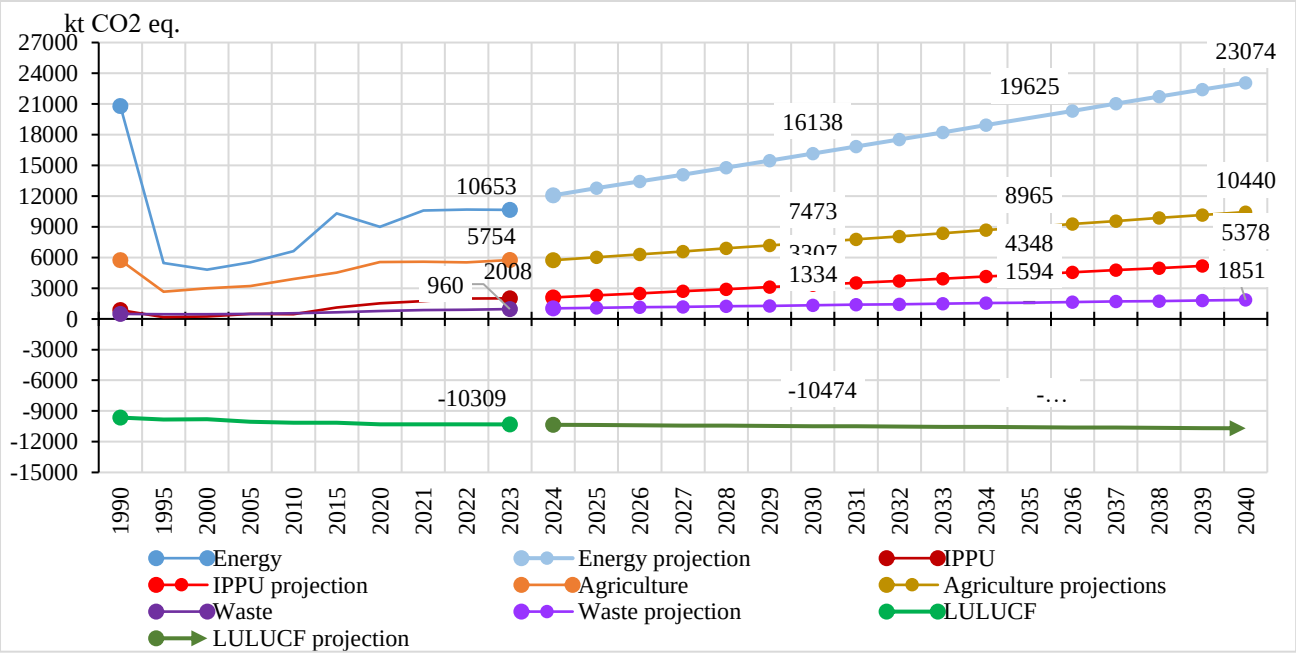


*Figure 2.36. GHG emissions and removals for the period 1990–2023, and projections of GHG emissions and removals under the baseline scenario by sector up to 2040.*

Projection of total GHG emissions (excluding LULUCF) and net emissions (including LULUCF) under the updated baseline scenario up to 2040 are presented in Figure 2.37.

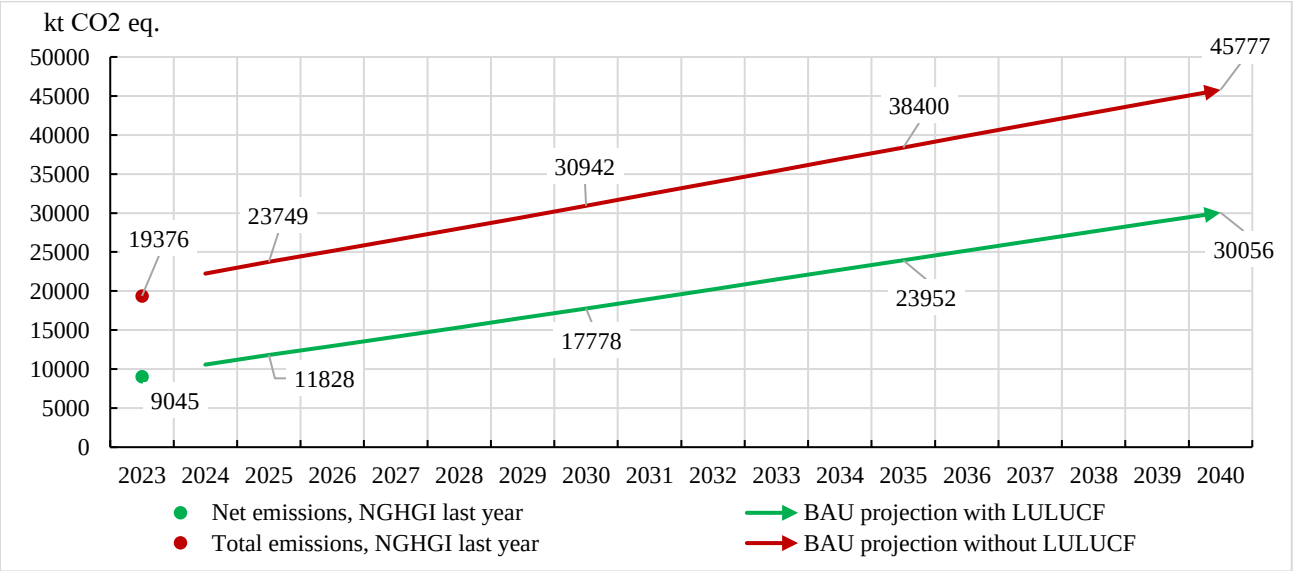



*Figure 2.37.Projections of total and net GHG emissions under the baseline scenario up to 2040.*

Projections of future emissions by gas type up to 2040 are presented in Figure 2.38.

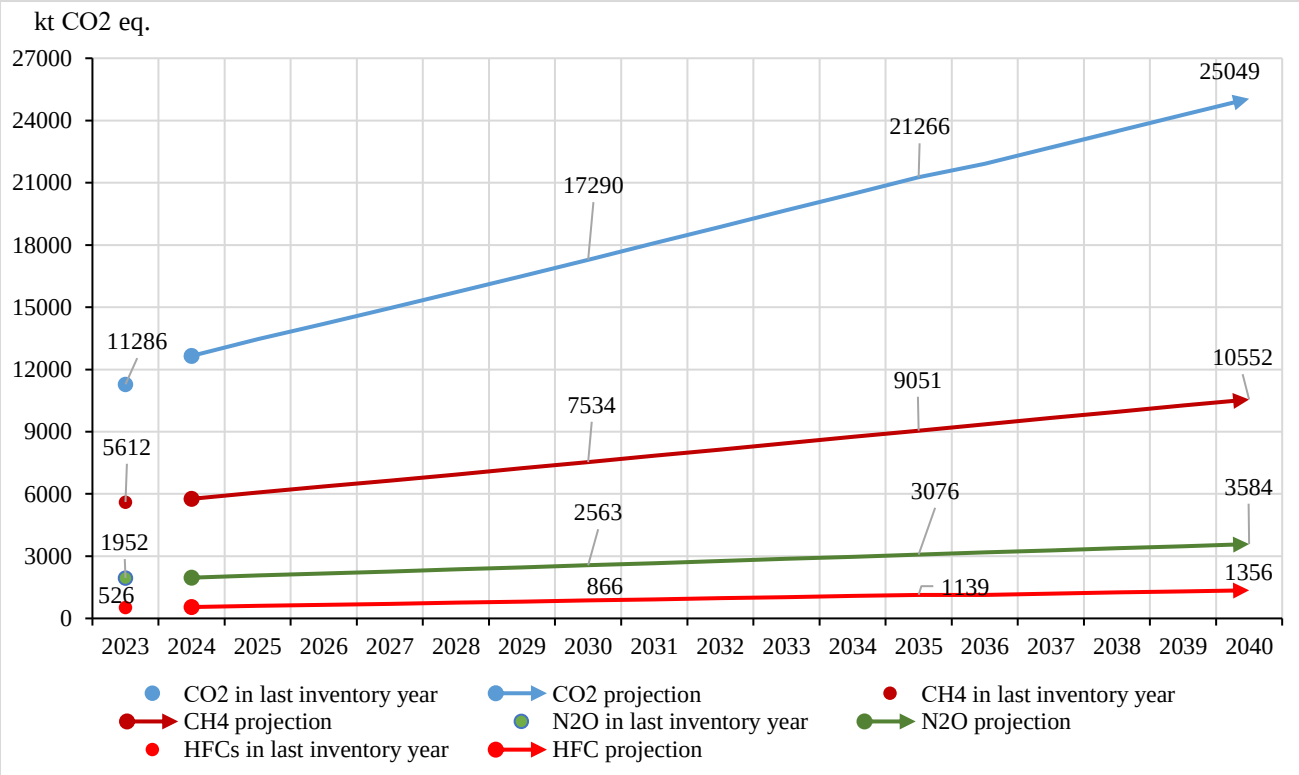



*Figure 2.38. GHG emissions projections by gas up to 2040.*

## 2.7.1. Methodology for constructing projections of emissions and removals

Due to the limited technical capacity of various sectors and the lack of financial resources for conducting more comprehensive research at the time of preparation of the First Biennial Transparency Report (BTR1), the Kyrgyz Republic provides less detailed information on the methodology for future emission projections, in accordance with paragraph 102 of the Modalities, Procedures and Guidelines (MPGs).

The development of projections for total and net emissions, presented above, was based on correlation and regression analysis of the National Greenhouse Gas Inventory (NGHGI) data for the period 1990–2023, and on data related to the main driver of development — gross domestic product at purchasing power parity (GDP at PPP) per capita in constant 2021 international US dollars for the same period (see Figure 2.39).

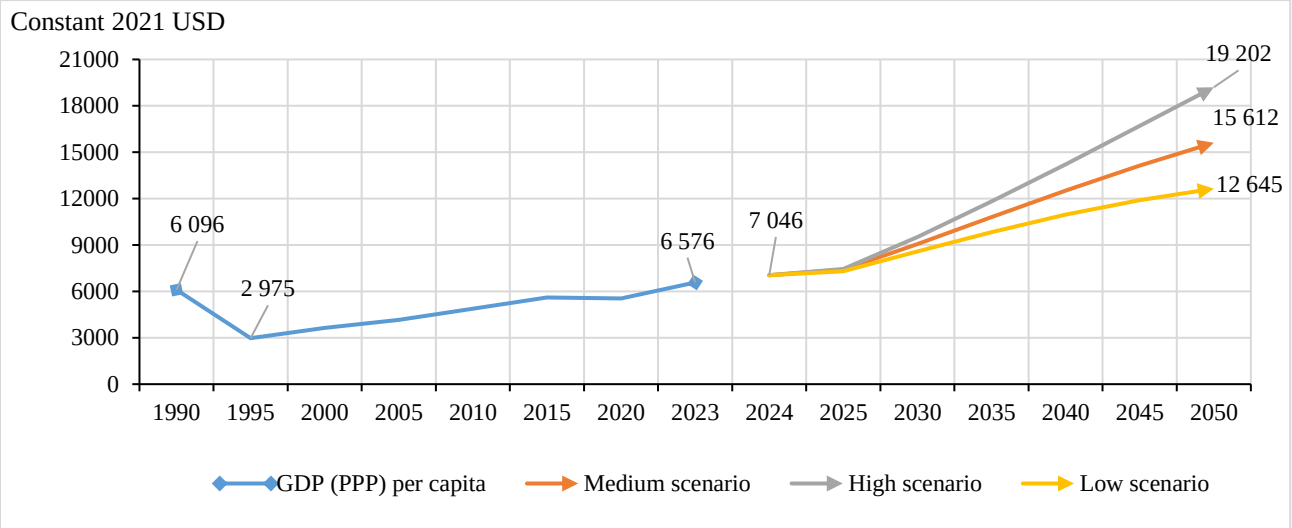



*Figure 2.39 Dynamics of GDP at PPP per capita during 1990–2023 and its projection up to 2050 under three scenarios.*

Based on the results of the analysis, linear regression equations were derived from the correlation of the two datasets for 1990–2023, and projections of emissions up to 2035 were constructed for the Energy, Industrial Processes and Product Use (IPPU), Agriculture, and Waste sectors, where a strong correlation with the growth of GDP at PPP per capita was identified.

Projections of GHG removals in the Land Use, Land-Use Change and Forestry (LULUCF) sector, which do not demonstrate dependence on this driver, were constructed using a linear regression equation based on the historical trend of removals for the period 1990–2023.

The development of projections of future GHG emissions by gas type was based on the sectoral projections of GHG emissions up to 2035, distributed by gas type in the proportions of 2023, as the last year of the NGHGI 1990–2023.

# 3. Information Related to Climate Change Impacts and Adaptation in Accordance with Article 7 of the Paris Agreement

In line with paragraph 104 of the Modalities, Procedures and Guidelines (MPGs), "each Party should provide information related to climate change impacts and adaptation under Article 7 of the Paris Agreement, as appropriate. The provision of such information is not mandatory."

The information presented below could, in particular, contribute to the recognition of the Kyrgyz Republic's adaptation efforts.

## 3.1 National Circumstances, Institutional Arrangements and Legal Frameworks

**Biogeophysical Characteristics.** The Kyrgyz Republic is located in the center of the Eurasian continent, in the northeast of Central Asia. The total area of its territory is 199.95 thousand km². The length from west to east is 900 km, and from north to south is 450 km. The Kyrgyz Republic borders four countries: The Republic of Kazakhstan, the People's Republic of China, the Republic of Tajikistan, and the Republic of Uzbekistan.

The Kyrgyz Republic is situated within the mountain systems of the Tien Shan and Pamir-Alai ranges. The entire diversity of landscapes and natural-climatic conditions of the Kyrgyz Republic is grouped into four natural-climatic zones: valley and foothill – up to 1,200 m; mid-mountain – from 1,200 to 2,200 m; high-mountain – from 2,200 to 3,500 m; and nival – above 3,500 m.

The climate of the Kyrgyz Republic is sharply continental, predominantly arid, and somewhat moderated by increased cloudiness and precipitation due to the high-mountain relief. The features of the climate are determined by the country's location in the Northern Hemisphere in the center of the Eurasian continent, its remoteness from large water bodies, and its close proximity to deserts.

Analysis indicates a significant increase in air temperature across the territory of the Kyrgyz Republic. The mean annual temperature during the period 1901–2023 has risen considerably. While the increase in mean annual temperature since the beginning of the last century amounted to 0.013°C per year (or 0.1°C per decade), during 1976–2017 the rate nearly doubled and reached 0.024°C per year (or 0.2°C per decade). Both trends are statistically significant at the 95% confidence level.

Precipitation has changed only slightly; however, in recent years rather sharp variations have been observed in certain regions, both in the direction of increase and decrease. Over the entire observation period, the annual precipitation sum across the republic showed a slight increase (0.847 mm/year), but during the last 50 years the growth rate declined substantially (0.363 mm/year), and over the last 20 years there has even been a tendency toward reduction (–1.868 mm/year). The precipitation regime in the Kyrgyz Republic, in addition to significant spatial and seasonal variability, is also characterized by interannual variability and cyclicity.

In general, for the Kyrgyz Republic as a whole, since the beginning of the last century there has been a slight trend toward an increase in the annual precipitation sum – by 0.11% per year (or 1% per decade). Since the mid-1970s, the rate of increase has accelerated and reached 0.2% per year (or 2% per decade). Both trends, however, are statistically insignificant.

**Demography.** The permanent population of the Kyrgyz Republic as of 1 January 2023 amounted to 7,037.6 thousand people (50.5% women). The share of the population younger than working age (1–15 years) was 34.5%, the share of the working-age population (men aged 16–62 years and women aged 16–57 years) was 56.5%, and the share of the population above working age (men aged 63 years

and older and women aged 58 years and older) was 8.1%. The share of the rural population was 65.8% (49.3% women), while the share of the urban population was 34.2% (52.4% women). The average annual population as of 1 January 2023 increased by 1.8% compared to the same date of the previous year.[227]

Due to the mountainous terrain, the population of the Kyrgyz Republic is distributed across the territory in a highly uneven manner. The number of inhabitants per km² in 2023 was 35 people. The population predominantly resides and carries out the majority of economic activities within foothills, intermountain basins, and mountain valleys.

**Economy.** In 2023, the nominal gross domestic product (GDP) amounted to 1,333,730.0 million Kyrgyz soms, with a real growth rate of 106.2%. The share of industry in total GDP was 12.5%; agriculture – 9.5%; construction – 7.3%; net taxes on products – 15.6%; trade, hotel and restaurant services – 18.4%; transport and storage – 3.0%; public administration and defense, compulsory social security – 5.4%; education – 5.8%; financial intermediation and insurance – 5.3%; real estate operations – 5.2%; information and communications – 2.5%; health care and social services – 2.3%; mining – 2.0%; and all other types of economic activity – 5.1%.[228]

In 2023, GDP per capita amounted to 2,137.2 US dollars. Exports of the Kyrgyz Republic in 2023 totaled 3,384,856.1 thousand US dollars, while imports amounted to 12,517,912.4 thousand US dollars.[229]

The number of employed persons in 2023 was 2,656.2 thousand (38.8% women), and the unemployment rate stood at 4.1%.

The subsistence minimum per capita in 2023 averaged 7,681.54 Kyrgyz soms per month, while the share of the population with consumer expenditures below the poverty line was 29.8%. The poverty rate in the Kyrgyz Republic in 2023 was 29.8%.[230]

**Infrastructure.** The mountainous landscape determines the importance of developing road infrastructure, which constitutes the basis for the sustainable development of the Kyrgyz Republic. The total length of motor roads in the country amounts to 34 thousand kilometers. Of these, 18,961.93 km are under the jurisdiction of the Ministry of Transport and Communications (MTC), while 15,190 km are under the jurisdiction of cities, villages, agricultural, industrial and other institutions. The length of international highways is 4,306 km, the length of national roads is 5,839 km, and the length of local roads is 8,816 km.[231]

The length of railways is also conditioned by the mountainous terrain and totals only 424 km. At the same time, the Kyrgyz Republic is working on the development of the railway network, in particular on the construction of the China–Kyrgyz Republic–Uzbekistan transit railway and its own branch line "North–South."

There are 12 certified airfields in the Kyrgyz Republic, of which 4 are international and 8 are domestic.

Another important element ensuring the country's energy security is thermal and hydropower infrastructure and the national power grid. In 2023, total electricity generation amounted to 13,838 million kWh, 87% of which was produced at hydropower plants (HPPs). The country operates 7 large HPPs

[227] NSK. https://stat.gov.kg/ru/statistics/naselenie/
[228] NSC.https://stat.gov.kg/ru/statistics/nacionalnye-scheta/
[229] NSC.https://stat.gov.kg/ru/statistics/vneshneekonomicheskaya-deyatelnost/
[230] NSC. https://stat.gov.kg/ru/statistics/uroven-zhizni-naseleniya/
[231] Ministry of Transport and Communications of the Kyrgyz Republic.https://mtd.gov.kg/zholdor/

and 2 thermal power plants (3,712 MW), as well as 19 small HPPs (63.4 MW). Plans include the commissioning of one additional large HPP (Kambarata-1) and 31 small HPPs.[232]

In the context of an arid climate, the irrigation infrastructure of the Kyrgyz Republic plays a key role in ensuring national food security. To supply water to irrigated lands, the country operates 28.9 thousand km of irrigation canals, of which 5.7 thousand km are inter-farm canals and 23.2 thousand km are intra-farm canals managed by local communities. There are 274 irrigation systems and 93 water storage facilities (reservoirs, dams, and basins). In total, 219 pumping stations operate in the country, of which 111 electrified pumping stations are managed by the Department of Water Resources (DWR). In addition, the Kyrgyz Republic has 5.7 thousand km of collector-drainage networks. Most irrigation infrastructure facilities in the country have been in operation for 30, 40 years or longer.[233]

**Adaptation Potential.** The readiness of the Kyrgyz Republic to adapt to the impacts of climate change is currently determined by existing legislation, policies, programs, investments, and actions aimed at sustainable development and at reducing climate risks and vulnerabilities.

These actions are based on adaptation priorities previously identified in the National Communications of the Kyrgyz Republic and incorporated into the implementation plan of the Nationally Determined Contribution (NDC) of the Kyrgyz Republic under the Paris Agreement. They are also reflected in sectoral adaptation plans for health, agriculture and irrigation, disaster risk reduction (DRR), energy, and climate-resilient cities. Furthermore, they are included in the main strategic development documents of the country: the National Development Strategy of the Kyrgyz Republic for 2018–2040 and the National Development Program of the Kyrgyz Republic until 2030.

## 3.2 Institutional Mechanisms and Legal Frameworks

The institutional and legal frameworks and mechanisms of the Kyrgyz Republic for adaptation include a wide range of stakeholders from the most vulnerable sectors. As with mitigation and the monitoring of progress in the implementation of the Nationally Determined Contribution (NDC) at the national level, adaptation processes and actions are regulated by the Coordinating Council on Climate Change, Environment and Sustainable Development, chaired by the Head of the Cabinet of Ministers (CM). The Council includes all ministries and agencies engaged in adaptation to climate change (see Chapter 2, section “Government Structure”).

*Table 3.1. Implementing Institutions for Adaptation Actions and Their Roles*

| № | Institution | Role in Adaptation Actions |
|---|---|---|
| 1. | Coordinating Council on Climate Change, Environment and Sustainable Development | (1) Coordinates the creation of synergies among ministries and agencies for climate action and the implementation of the NDC. (2) Approves the NDC, Adaptation Plan (AP), and climate reporting documents on progress in its implementation. |
| 2. | Ministry of Natural Resources, Ecology and Technical Supervision (MNRETS) | (1) Develops and implements national climate policy and legislation for the implementation of the Adaptation Plan (AP) and sectoral APs. (2) Coordinates implementation and collects information for monitoring progress of APs. (3) Prepares climate reporting on AP progress. (4) Develops and introduces the national monitoring and evaluation (M&E) system. (5) Archives all information on AP implementation. (6) Develops APs and implements adaptation measures on ecosystems and biodiversity for Specially Protected Natural Areas (SPNA). (7) Serves as an |

[232] Ministry of Energy (MoE), Asian Development Bank (ADB). 2022. Master Plan for the Comprehensive Development of the Energy Sector of the Kyrgyz Republic. https://minenergo.gov.kg/media/uploads/2022/12/07/mp-kr-finalreport-rev5_v2_en_website_hQEeGIO.pdf

[233] State Irrigation Development Program of the Kyrgyz Republic for 2017–2026. Approved by Resolution of the Government of the Kyrgyz Republic No. 440 of 21 July 2017.

| № | Institution | Role in Adaptation Actions |
|---|---|---|
| | | information provider on implemented adaptation actions. (8) Coordinates the preparation of Adaptation Communications to the UNFCCC and the QA/QC process. |
| 3. | Central Asian Institute for Applied Geosciences (CAIAG) | (1) Developer of sectoral APs: Health, Agriculture and Irrigation, Disaster Risk Reduction (DRR), Ecosystems and Biodiversity. (2) Implements research projects on river basins and glaciers. (3) Collects and provides research data. (4) Participant in preparation of Adaptation Communications to the UNFCCC and QA/QC process. |
| 4. | Ministry of Energy (MoE) and its subdivisions | (1) Develops the AP for the Energy sector. (2) Executor and coordinator of AP implementation in the Energy sector. (3) Provides information on implemented actions. (4) Participant in preparation of Adaptation Communications to the UNFCCC and QA/QC process. |
| 5. | Ministry of Transport and Communications (MTC) | (1) Develops the AP for the Transport and Infrastructure sector. (2) Executor and coordinator of AP implementation in the Transport and Infrastructure sector. (3) Provides information on implemented actions. (4) Participant in preparation of Adaptation Communications to the UNFCCC and QA/QC process. |
| 6. | Ministry of Water Resources, Agriculture and Processing Industry (MWRAPI) | (1) Develops the AP for the Agriculture and Water Resources sector. (2) Executor and coordinator of adaptation measures in agriculture and water resources. (3) Provides information on implemented adaptation projects in the sector. (4) Participant in preparation of Adaptation Communications to the UNFCCC and QA/QC process. |
| 7. | Ministry of Emergency Situations (MES) | (1) Develops the AP for the Disaster Risk Reduction (DRR) sector. (2) Executor and coordinator of adaptation measures in DRR and forestry. (3) Provides information on implemented adaptation projects in the sector. (4) Participant in preparation of Adaptation Communications to the UNFCCC and QA/QC process. |
| 8. | Ministry of Health (MoH) | (1) Develops the AP for the Health sector. (2) Executor and coordinator of adaptation measures in health. (3) Provides information on implemented adaptation projects in the sector. (4) Participant in preparation of Adaptation Communications to the UNFCCC and QA/QC process. |
| 9. | City Mayors' Offices and Local Self-Government Bodies (LSGBs) | (1) Develop the AP for Climate-Resilient Cities and Territories. (2) Executors and coordinators of adaptation measures. (3) Provide information on implemented adaptation projects. (4) Participants in preparation of Adaptation Communications to the UNFCCC and QA/QC process. |
| 10. | National Statistical Committee (NSC) | (1) Provides cross-sectoral data for all sectors. (2) Participant in the process of ensuring the quality of adaptation reporting. |
| 11. | State Agency for Architecture, Construction and Housing and Communal Services | (1) Develops the AP for Climate-Resilient Cities and Territories. (2) Executor and coordinator of adaptation measures. (3) Provides information on implemented adaptation projects. (4) Participant in preparation of Adaptation Communications to the UNFCCC and QA/QC process. |
| 12. | Private Sector | (1) Participates in the development of APs across various sectors. (2) Executor of adaptation measures. (3) Provides information on implemented adaptation projects. (4) Participant in preparation of Adaptation Communications to the UNFCCC and QA/QC process. |
| 13. | Research Institutes and Universities | (1) Develop sectoral APs. (2) Conduct adaptation-related research. (3) Provide information on implemented adaptation projects. (4) Participants in preparation of Adaptation Communications to the UNFCCC and QA/QC process. |

## 3.3 Impacts, Risks and Vulnerabilities

According to paragraph 107 of the Modalities, Procedures and Guidelines (MPGs) under the UNFCCC Enhanced Transparency Framework, each Party shall provide, as appropriate, the following information: current and projected climate trends and hazards; observed and potential impacts of climate change, including sectoral, economic, social and/or environmental vulnerabilities; as well as approaches, methodologies and tools applied.

## 3.3.1 Current Climate Change in the Territory of the Kyrgyz Republic

### *3.3.1.1 The Territory of the Kyrgyz Republic in the Context of the Global Climate*

Anthropogenic climate change is already affecting many extreme weather and climate events in all regions of the globe. Evidence of observed changes in such extremes as heatwaves, heavy precipitation, droughts, and tropical cyclones, as well as their attribution to human influence, has become more robust since the publication of the Fifth Assessment Report (AR5) of the Intergovernmental Panel on Climate Change (IPCC) in 2014. With growing confidence, it can be stated that humanity faces an intensification of observed anthropogenic climate change and associated climate impacts: under all IPCC emissions scenarios considered, global near-surface temperature is projected to continue increasing at least until the middle of the century. Continued global warming is expected to further intensify the global hydrological cycle, including its variability, global monsoon precipitation, and the intensity of wet and dry events. Under scenarios with increasing $CO_2$ emissions, carbon sinks in the ocean and on land will become less effective in slowing the accumulation of $CO_2$ in the atmosphere.

The World Meteorological Organization (WMO) [234], report, incorporating the "latest scientifically based data" on key climate indicators such as atmospheric carbon dioxide concentration, ocean heat content, and glacier mass balance, states that in 2023 the concentration of carbon dioxide in the atmosphere reached its highest level in the last 800,000 years, while in 2024 the ocean heat content reached its highest level in more than half a century of observations, surpassing the previous record set in 2023. By 2023, two other greenhouse gases—methane and nitrous oxide—had also reached levels unprecedented in the last 800,000 years.

According to the report, the global average temperature in 2023 was 1.45°C higher than the mean temperature for the period 1850–1900, which is used to represent pre-industrial conditions.

In 2015, 196 Parties signed the agreement to continue efforts "to limit the temperature increase to 1.5°C above pre-industrial levels." According to the United Nations, exceeding 1.5°C in a single year or month does not signify failure to meet the goal of the Agreement, which refers to warming over a multi-decadal timescale.

In recent decades, global precipitation over land areas has been increasing, with its rate accelerating. Depending on the data source, this increase is estimated at 5–10 mm per decade, against the background of significant interannual variability and regional heterogeneity. It is also likely that there has been a global weakening of near-surface winds over land, particularly pronounced in the Northern Hemisphere. On a global scale, in the past thirty years, the average rate of glacier mass loss has increased by 30%.

It is important to emphasize that a single year with warming exceeding 1.5°C does **NOT** mean that the long-term temperature goals of the Paris Agreement have not been achieved, as these are measured over decades rather than in individual years. However, it must be understood that every fraction of a degree of warming matters. Regardless of whether the level of warming is below or above 1.5°C, each additional increase in global temperature amplifies the impacts on human life, the economy, and the planet as a whole.[235]

The Kyrgyz Republic is located in the mountainous part of the Central Asian region, which lies in the center of the Eurasian continent and forms a continuation of the extensive desert belt of Central Asia, including such deserts as the Taklamakan and the Gobi, as well as the high-altitude belt of Tibet, the Himalayas, the Hindu Kush, and the Kunlun mountains. This area represents the northernmost position of all continental deserts worldwide and constitutes a vast, endorheic, and enclosed region of the Aral–

[234] WMO. 2024. State of the Global Climate 2024.
[235] Ibid.

Caspian basin, bordered to the south and east by the mountain ranges of the Pamirs and the Tien Shan. The absence of high mountain ranges to the west (with the exception of relatively low sections of the Ustyurt Plateau) does not impede the free penetration of western and northwestern air masses into the region. The Central Asian region is influenced by two of the most powerful and active atmospheric circulation centers: the Siberian High (Asian Maximum) in winter, with its center over Mongolia, and the summer thermal depression (Asian Minimum), which forms over the Indo–Iranian region. [236]

During the cold season, atmospheric circulation over the northern part of the Central Asian region is determined by the dominance of the Siberian High, the intensity of which strengthens under prevailing easterly circulation patterns. At this time, the southwestern extension of the Siberian High spreads across nearly the entire area, reaching as far as the mountain ranges in the south. In the zone of the southern deserts during this season, a different circulation type prevails: due to the significant temperature contrast between northern and southern areas, a planetary frontal zone (PFZ) forms, leading to the development of cyclonic activity and the onset of the rainy season in the southern parts of the region. The most intensive cyclonic activity occurs when the Siberian High is weakly developed.[237]

During the summer season, the dominant feature is the thermal depression, which reaches its maximum intensity in July and August. This depression represents a relatively stationary low-pressure area, the main characteristic of which is the absence of well-defined frontal formations. Across most of the region, the summer season is marked by clear, dry, and hot weather. Over time, the thermal depression is gradually filled with cooler air as a result of intrusions of western and northwestern air masses.

Meridional processes also play an important role in shaping the regional climate. These processes are accompanied by the southward transport of cold Arctic air from the Kara and Barents Seas across the flatlands of Kazakhstan, extending as far as the Kyrgyz Range and the Zailiyskiy Alatau. The diversity of relief forms contributes to the development of various local circulation patterns, especially in summer, when strong temperature contrasts arise between lowland areas and foothills.[238]

The territory of the Kyrgyz Republic is characterized by complex high-mountain relief, featuring deep dissection and diverse orientation of mountain slopes in relation to the sun and airflows, which creates exceptional climatic variety and determines a pronounced vertical climatic zonation. The climate of the country is sharply continental and predominantly arid. Four altitudinal climatic zones are distinguished: valley-foothill (up to 1,200 m), mid-mountain (1,200–2,200 m), high-mountain (2,200–3,500 m), and nival (above 3,500 m above sea level). Additionally, the territory is divided into four climatic regions: northern and northwestern, the Issyk-Kul basin, the inner Tien Shan, and the southwestern region.

In the Fourth National Communication of the Kyrgyz Republic under the United Nations Framework Convention on Climate Change (UNFCCC) (2024), it was noted that the increase in mean annual air temperature has been observed since the end of the 19th century across all climatic zones and regions of the country. Compared with pre-industrial levels, over a 125-year period, the average temperature rose by 1.2°C, with the highest increase recorded in the southwestern region and the lowest in the Issyk-Kul basin. The warming trend in the region, as in the entire extratropical territory of the Northern Hemisphere and the globe as a whole, has accelerated over time. For example, the trend in mean annual temperature between 1960 and 2010 was 0.25°C per decade, while between 1990 and 2010 it reached approximately 0.7°C per decade.

[236] Zhiltsova E.L. 2023. First Report under the GCF/UNDP Project "Advancing the Process of Developing the National Adaptation Plan (NAP) for Medium- and Long-Term Planning and Implementation of Climate Change Adaptation Measures in the Kyrgyz Republic" (PID 00117233).
[237] Ibid.
[238] Ibid.

Analysis of temperature changes in the Kyrgyz Republic indicates a statistically significant increase. Mean annual air temperature during the period 1901–2021 rose at an average rate of 0.13°C per decade (see Figure 6.3). It is noteworthy that over the last 46 years (1976–2021) the rate of increase almost doubled, reaching 0.22°C per decade (both trends are statistically significant at the 95% confidence level).[239]

An almost uniform rise in mean annual temperature has been observed across all altitudinal zones and in all climatic regions. The mean annual precipitation over most of the country's territory has increased only slightly (by 5–6%) compared to pre-industrial times, while showing significant temporal variability.[240]

In the Kyrgyz Republic, temperature increase has led to more frequent and intense extreme events, such as droughts, unpredictable seasonal weather, and an increasing number of natural disasters, including landslides, mudflows, and avalanches. These impacts result in loss of life and livelihoods and have adverse effects on key sectors of the national economy, including agriculture and energy, thereby contributing to economic losses and poverty. Climate change represents a serious challenge to achieving the Sustainable Development Goals (SDGs), and urgent action is therefore required both to reduce greenhouse gas (GHG) emissions and to adapt to the impacts of climate change.

### *3.3.1.2 Contemporary Temperature and Precipitation Trends in the Kyrgyz Republic*

For the assessment of contemporary climate trends, homogeneous and homogenized monthly data on temperature and precipitation from 22 meteorological stations of the Kyrgyz Republic were used for the period 1980–2021, provided by Kyrgyzhydromet (see Figure 3.1). The analysis considered the territory of the country as a whole, as well as its main administrative units (regions). For the central and southern regions, the available data are evidently insufficient to fully characterize climatic conditions; however, general trends were assessed.


*Figure 3.1. Location of meteorological stations of Kyrgyzstan*

[239] MNRETS. 2024. Fourth National Communication (NC4) of the Kyrgyz Republic under the UNFCCC.
[240] State Agency for Environmental Protection and Forestry (SAEPF). 2016. Third National Communication (NC3) of the Kyrgyz Republic under the UNFCCC.

Figure 3.2 presents the time series of annual values of air temperature and precipitation by regions of the Kyrgyz Republic, expressed as deviations from the 1981–2000 baseline norm.

It can be observed that temperature trends vary synchronously throughout the year across the entire territory of the Kyrgyz Republic, and show positive values in all seasons. The mean annual temperature trend for the country was 0.28°C per decade, while across individual regions it ranged from 0.25°C to 0.32°C per decade. At the 95% significance level, annual and spring trends are statistically significant across the entire territory, and in the northern regions, summer trends are also significant. The strongest trends were recorded in spring (0.6–0.7°C per decade), particularly in March, where they almost reached or exceeded 1.0°C per decade. The weakest trends were observed in November–December, as well as in August. Winter trends ranged from 0.13–0.14°C per decade in Chui and Issyk-Kul regions to 0.25–0.29°C per decade in Batken, Osh, and Talas regions. Summer trends ranged from 0.12–0.15°C per decade to 0.20–0.23°C per decade, with the minimum trend in Jalal-Abad region (0.06°C per decade). Near-zero or slightly negative trends were observed in most regions in November, reaching –0.3°C per decade in Talas and Batken regions. An exception was Naryn region, where the positive trend exceeded 0.4°C per decade; however, all of these monthly trends were statistically insignificant.

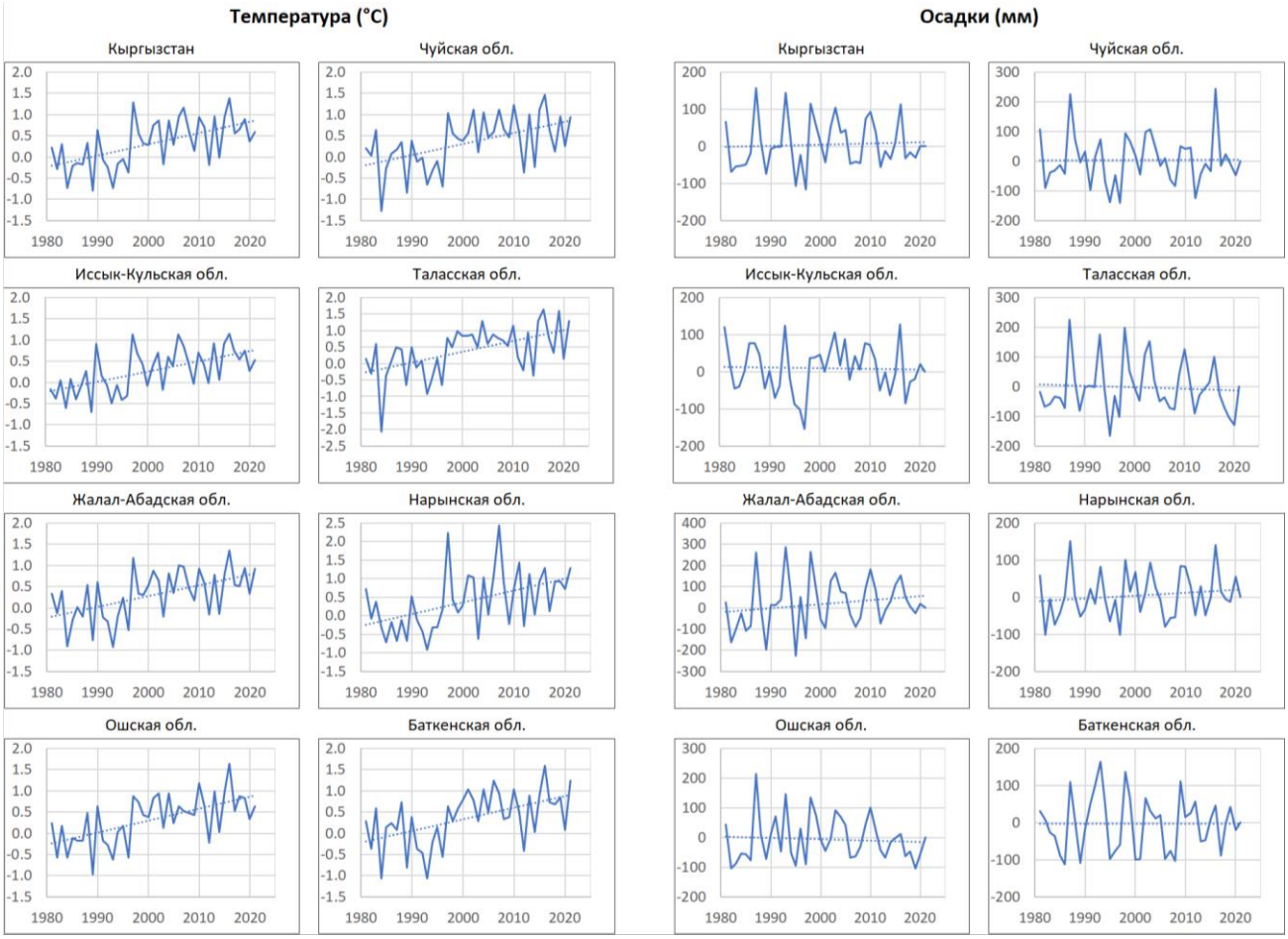



*Figure 3.2. Time series of deviations from the 1981–2000 norm of mean annual air temperature (°C) and annual precipitation (mm)*[241]

With regard to precipitation, the observed trends for the period 1981–2020 were minor in magnitude, variable in direction, and all statistically insignificant.

[241] Zhiltsova E.L. 2023. First Report under the GCF/UNDP Project "Advancing the Process of Developing the National Adaptation Plan (NAP) for Medium- and Long-Term Planning and Implementation of Climate Change Adaptation Measures in the Kyrgyz Republic" (PID 00117233).

As shown in Figure 3.3, the annual course of precipitation trends across the regions generally follows a similar pattern, with the exception of Naryn region, where it differs noticeably (although it should be noted that only two meteorological stations are located there). Overall, a slight positive annual trend of approximately 4 mm per decade was observed for the Kyrgyz Republic. In Talas and Osh regions, small negative trends of about –5 mm per decade were recorded.

Jalal-Abad region differs somewhat from the others, where the annual precipitation trend exceeded +20 mm per decade; however, this was against the background of a high climatological norm of approximately 600 mm per year, compared with the national average of around 400 mm per year.

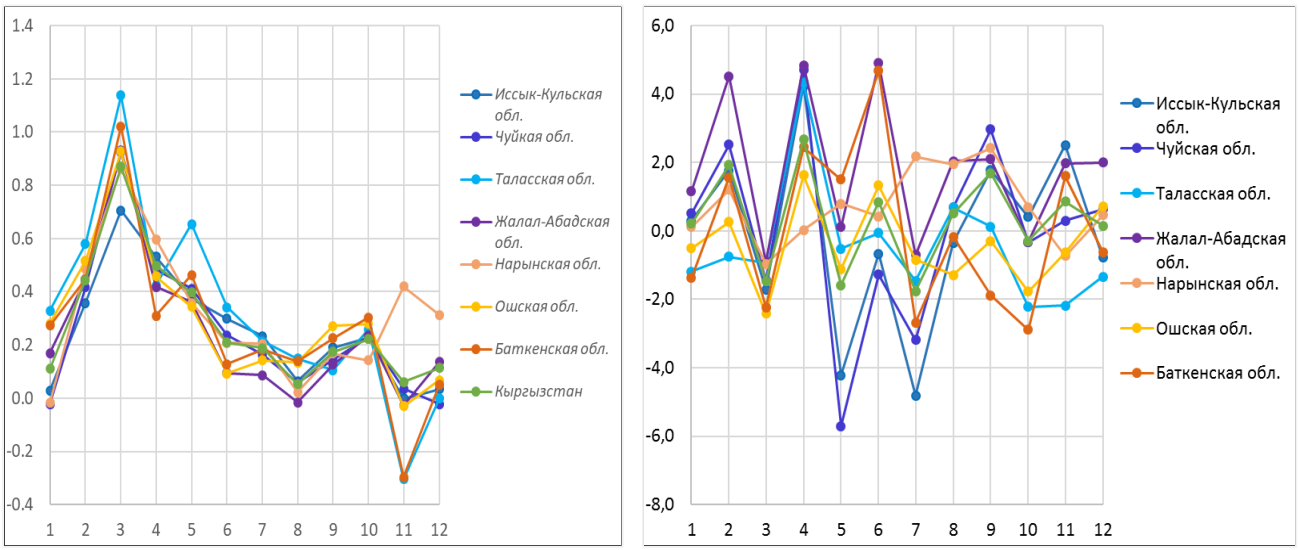



*Figure 3.3. Graphs of the annual course of linear trend coefficients of air temperature (°C per decade, left) and precipitation (mm per decade, right) for 1981–2020*[242]

The graphs in Figure 3.3 also indicate a tendency toward a certain decrease in interannual variability of precipitation in most regions of the Kyrgyz Republic since the early 1980s.

## 3.3.2 Future Projections and Climate Change in the Kyrgyz Republic [243]

Projections of temperature and precipitation for the territory of the Kyrgyz Republic in the 21st century were derived from scenario-based calculations of global climate models under the Coupled Model Intercomparison Project Phase 6 (CMIP6).[244]

The CMIP6 models were selected for predictive calculations according to the following criteria:

- availability of monthly resolution data on air temperature (tas) and precipitation (pr);

[242] Zhiltsova E.L. 2023. First Report under the GCF/UNDP Project "Advancing the Process of Developing the National Adaptation Plan (NAP) for Medium- and Long-Term Planning and Implementation of Climate Change Adaptation Measures in the Kyrgyz Republic" (PID 00117233).
[243] Zhiltsova E.L. 2023. First Report under the GCF/UNDP Project "Advancing the Process of Developing the National Adaptation Plan (NAP) for Medium- and Long-Term Planning and Implementation of Climate Change Adaptation Measures in the Kyrgyz Republic" (PID 00117233).
[244] The Coupled Model Intercomparison Project (CMIP) is a large-scale international collaborative effort aimed at improving the understanding of climate change and its impacts on the Earth system and human society. It has existed since the 1990s, and today it is in its sixth phase (CMIP6), which provides extensive information for the Assessment Reports of the Intergovernmental Panel on Climate Change (IPCC).

- availability of both historical (historical) and two projection scenarios — the most "aggressive" (SSP5-8.5[245] and the "moderate" (SSP2-4.5);
- availability of baseline datasets for all selected scenarios.

A total of 33 models meeting these criteria were presented on the CMIP6 websites; however, the CIESM model was subsequently excluded, since its precipitation data evidently contained an error of two to three orders of magnitude, with values indistinguishable from zero. All models have different spatial resolutions, ranging from 0.7 to 2.5 degrees in latitude and longitude. The projection scenarios cover the period from 2015 to 2100 (or 2099), while the historical dataset spans 1850 to 2014.

Prior to conducting the projections, the territory of the Kyrgyz Republic was tested for climatic homogeneity. Pairwise correlation coefficients were calculated between the temperature and precipitation series of 22 meteorological stations across the country, as well as between the station series and the average series for the Kyrgyz Republic as a whole, for the annual period, winter (December–February), and summer (June–August). Regional averaging in constructing the mean regional series was performed using weights proportional to the area of "influence" of each station, defined as the locus of points for which the given station is the nearest (Voronoi–Thiessen polygons). The mean correlation coefficients across the territory for annual, winter, and summer periods are presented in Table 3.2.

*Table 3.2. Mean pairwise correlation coefficients of temperature and precipitation for 22 meteorological stations in the Kyrgyz Republic*

| Correlation | Temperature | | | Precipitation | | |
|---|---|---|---|---|---|---|
| | Annual | Winter | Summer | Annual | Winter | Summer |
| Between station series and the national average series | **0.85** | 0.84 | 0.86 | 0.72 | 0.68 | 0.66 |
| Between station series | **0.73** | 0.71 | 0.74 | 0.51 | 0.45 | 0.42 |

The average correlation coefficient of mean annual temperature between meteorological stations and the regional mean series was 0.85, which allows the territory of the Kyrgyz Republic to be considered climatically homogeneous for the purposes of climate projections.

For assessing the reliability of models applied to the territory of the Kyrgyz Republic, the primary criterion adopted was the coefficient of the linear trend of annual temperature values for the period 1980–2014 (within the historical reconstruction period of the models). As a supplementary criterion, the coefficient of the linear trend of annual precipitation values over the same period was used. For comparison, deviations of mean values of temperature and precipitation for 1995–2014 were also considered relative to the baseline period 1981–2000.

The quality of the models was evaluated not only against observational data from meteorological stations, but also using the global meteorological archive with monthly resolution and a spatial grid of 0.5 × 0.5 degrees — CRU_TS_4.06 (http://www.cru.uea.ac.uk/data/hrg/). Understandably, model rankings based on station observations and gridded archive data showed some differences.

#### *3.3.2.1 Scenarios for the Territory of the Kyrgyz Republic as a Whole*

Figure 3.4 presents the mean regional time series of deviations from the 1981–2000 baseline of mean annual air temperature and annual precipitation for two projection scenarios, using both the full ensemble and the optimal ensemble of models for the territory of the Kyrgyz Republic.

It can be observed that both ensembles reproduce the temperature trajectory almost identically: temperature increases consistently under both scenarios, which remain virtually indistinguishable from

[245] Shared Socio-economic Pathways (SSP) are climate change scenarios that reflect projected global socio-economic developments until 2100, as defined in the Sixth Assessment Report (AR6) of the IPCC in 2021.

each other until the mid-2030s. Thereafter, the trajectories diverge, and by the end of the 21st century, temperature increase reaches nearly +7°C under the "high-emissions" scenario SSP5-8.5, and approximately +3.5°C under the "moderate" scenario SSP2-4.5.

Annual precipitation also increases under both scenarios, though in a more complex manner compared with temperature. Until about 2050, when the increase reaches approximately +50 mm, the differences between the two scenarios are minimal. After 2050, the trajectories diverge: by the end of the century, precipitation increase reaches 90–100 mm (around +25%) under SSP5-8.5, and more than 60 mm (around +15%) under SSP2-4.5. The growth under SSP5-8.5 is quasi-linear, while under SSP2-4.5 it is wave-like, showing some decrease after 2050, followed by further growth with small fluctuations. Differences between ensembles for precipitation are reflected in slightly greater interannual variability, more pronounced divergence of the two scenario trajectories up to 2050 (particularly visible in the 10-year moving averages, shown as bold lines), and overall somewhat lower deviation values by the end of the 21st century (around 5–10 mm) for the optimal ensemble (27 models).

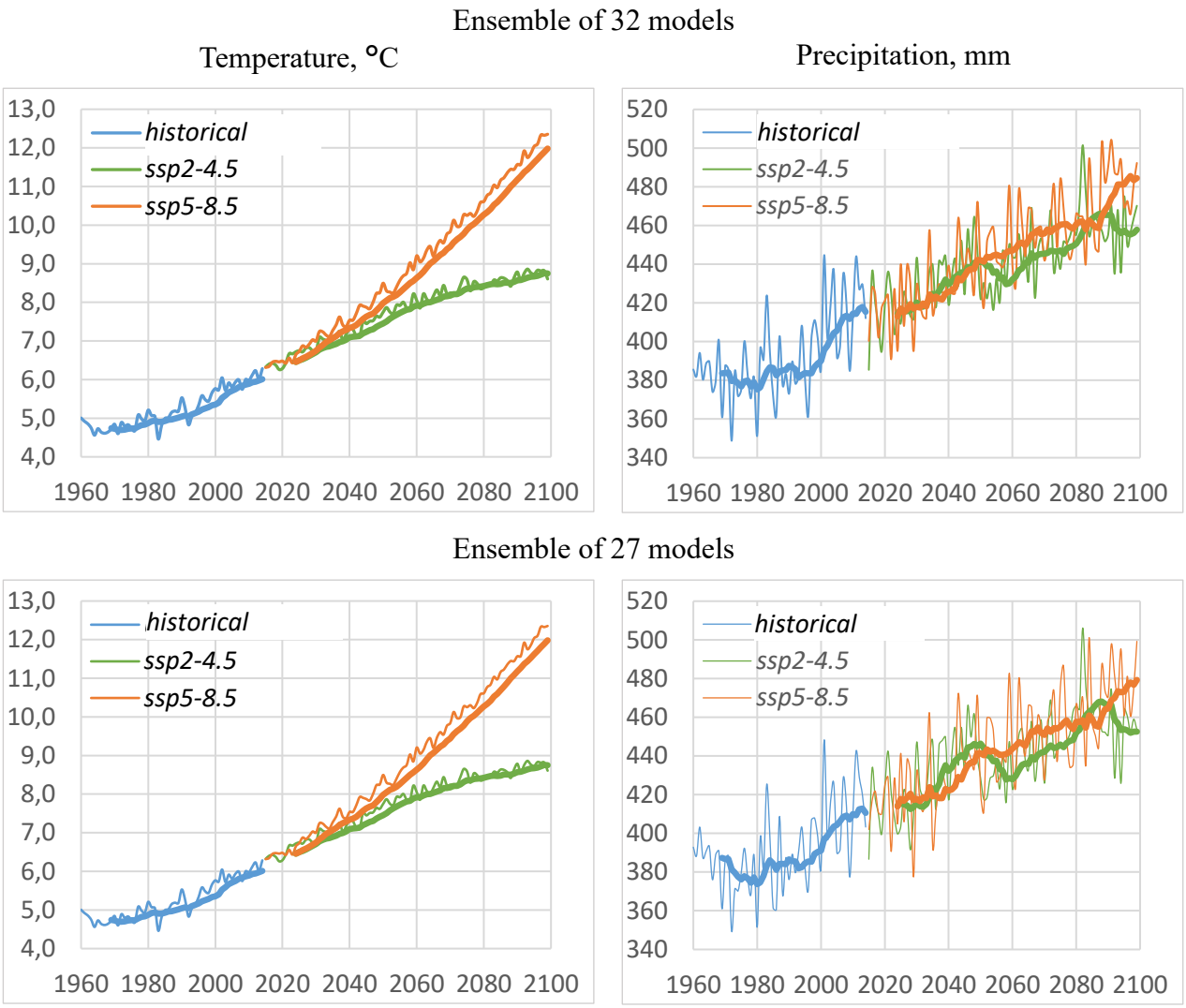



*Figure 3.4. Average regional time series of deviations from the 1981-2000 norm of average annual air temperature (left) and annual precipitation (right) for two forecast scenarios based on two model ensembles for the territory of Kyrgyzstan.*

Figure 3.4 shows the average regional time series of deviations from the 1981-2000 norm for air temperature and annual precipitation for the four seasons of the year based on the optimal ensemble.

It can be observed that temperature increases consistently in all seasons under both scenarios, with the maximum increase occurring in summer — by 2100 exceeding 7°C under scenario SSP5-8.5 and nearly 4°C under scenario SSP2-4.5. In winter, the increase is smaller by 0.2–0.3°C, slightly less in autumn, and lowest in spring, exceeding 6°C under SSP5-8.5 and around 3.5°C under SSP2-4.5.

Precipitation projections are considerably less reliable, with a very wide spread of model outputs, where standard deviations across models exceed mean values by a factor of three or more. Compared to temperature, precipitation changes are less linear, although in general an increase is projected for all seasons except summer. The maximum and most quasi-linear growth occurs in winter, reaching by 2100 approximately +45 mm (over 60%) under SSP5-8.5 and 20–25 mm (over 30%) under SSP2-4.5 (with a slight decline after 2090). In spring, precipitation also shows a notable increase, with nearly 40 mm (25–30%, with an additional peak around 2070) under SSP5-8.5 and more than 25 mm (about 20%) under SSP2-4.5. In autumn, increases are around 10–15 mm (50–55%) under both scenarios, with a more uniform trajectory under SSP5-8.5 and a wave-like pattern under SSP2-4.5. Finally, in summer, precipitation follows a wave-like pattern under SSP2-4.5, with a net increase of about 5 mm (less than 1%), while under SSP5-8.5 it decreases by approximately the same magnitude. Against the background of substantial temperature rise, this may lead to an increased frequency and intensity of summer droughts.

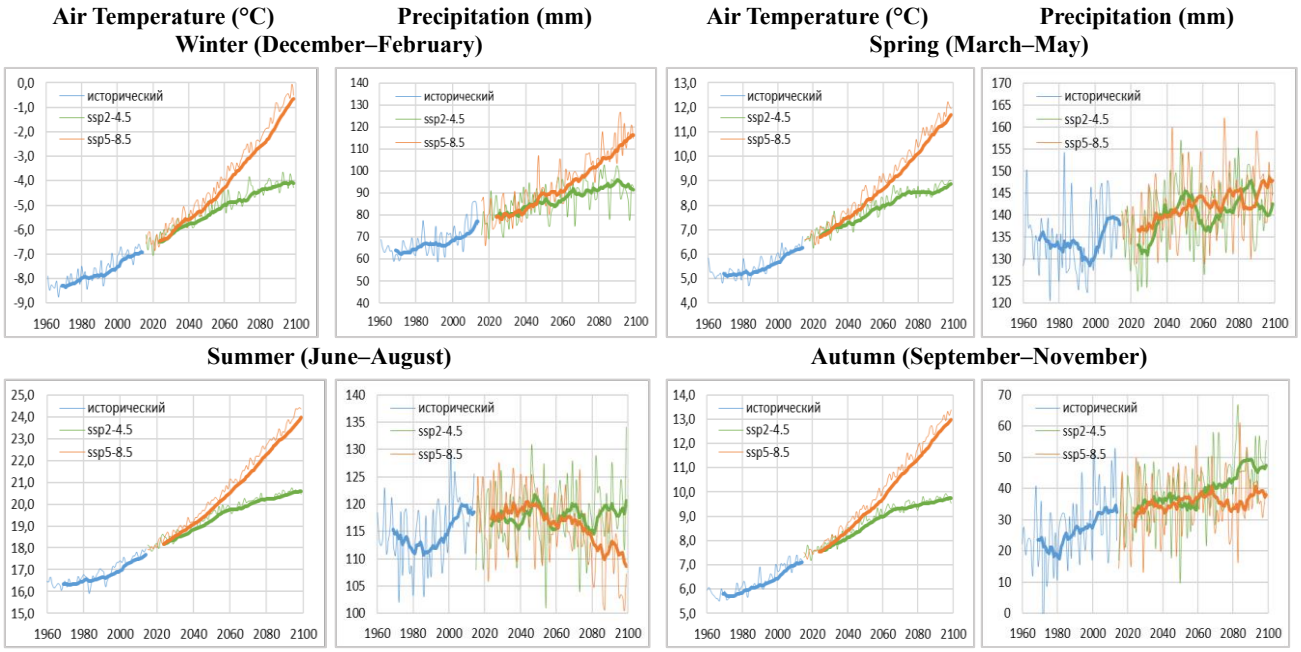



*Figure 3.5. Regional average time series of deviations from the 1981–2000 norm for seasonal air temperature and precipitation under two projection scenarios based on the optimal model ensemble for the territory of the Kyrgyz Republic.*

### *3.3.2.2 Spatial Distribution of Projected Climate Changes: Scenario Projections by Regions of the Kyrgyz Republic*

For both the full and optimal ensembles, mean monthly, seasonal, and annual deviations from the 1981–2000 baseline were calculated for four time periods: 2021–2040, 2041–2060, 2061–2080, and 2080–2099, using a 0.5 × 0.5 degree grid for the domain 60°–90° E × 30°–50° N. Figures 5.3 and 5.4 present maps based on the full ensemble of models under scenario SSP5-8.5 for the period 2041–2060, while Figures 5.5 and 5.6 show annual cycles of deviations for these periods across the seven regions of the Kyrgyz Republic under both scenarios.

In Figures 3.6 and 3.7, for both temperature and precipitation, a similar spatial distribution of means and standard deviations (inter-model spread) by season can be observed. In winter, as well as for the annual mean, the largest values are typical for the western regions of the Kyrgyz Republic—Talas, Jalal-Abad, Osh, and Batken. In summer, the highest values are observed in the Issyk-Kul region, where the maximum inter-model spread is also evident, likely explained by the specific features of summer local circulation in the Issyk-Kul basin, which are poorly reproduced by global models. As expected, a greater spread of values is generally characteristic of high-mountain areas, while the smallest spread is typical of the desert plateaus of China and the lowland territories of Kazakhstan. In summer, a slight decrease in precipitation can also be observed in Batken, western Osh, and northern Issyk-Kul regions, along with a noticeable increase in the southern part of the Issyk-Kul region.

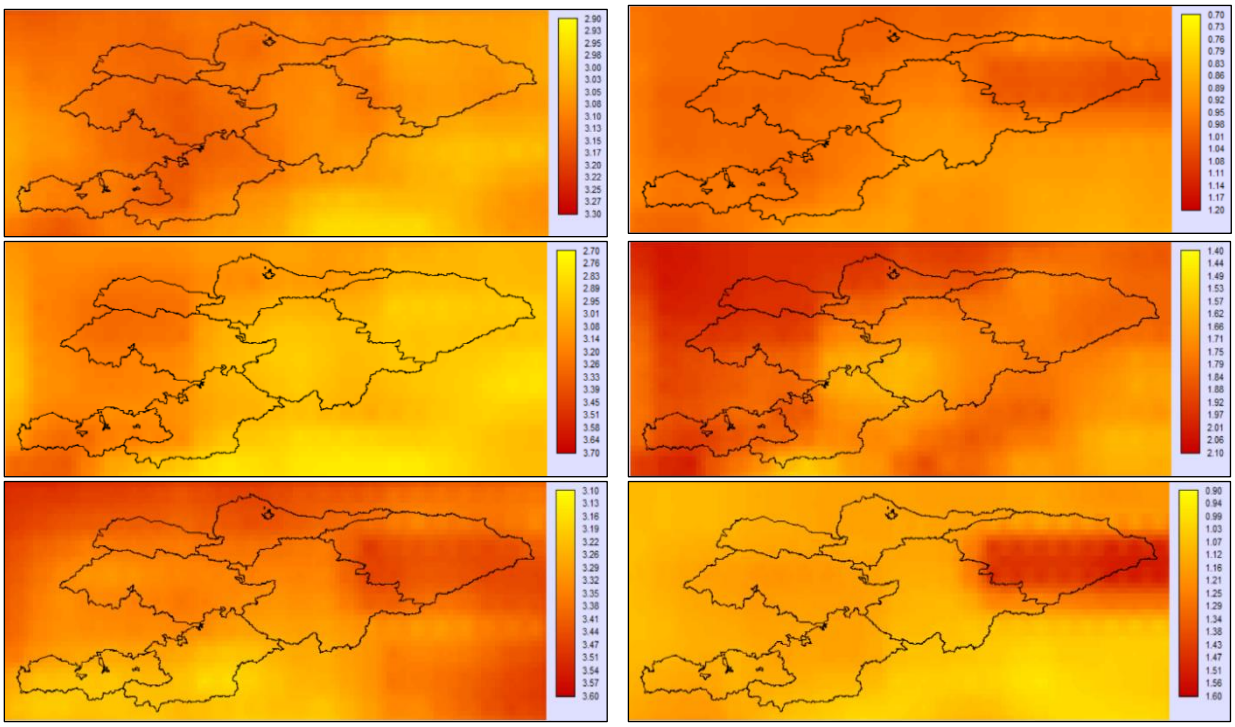
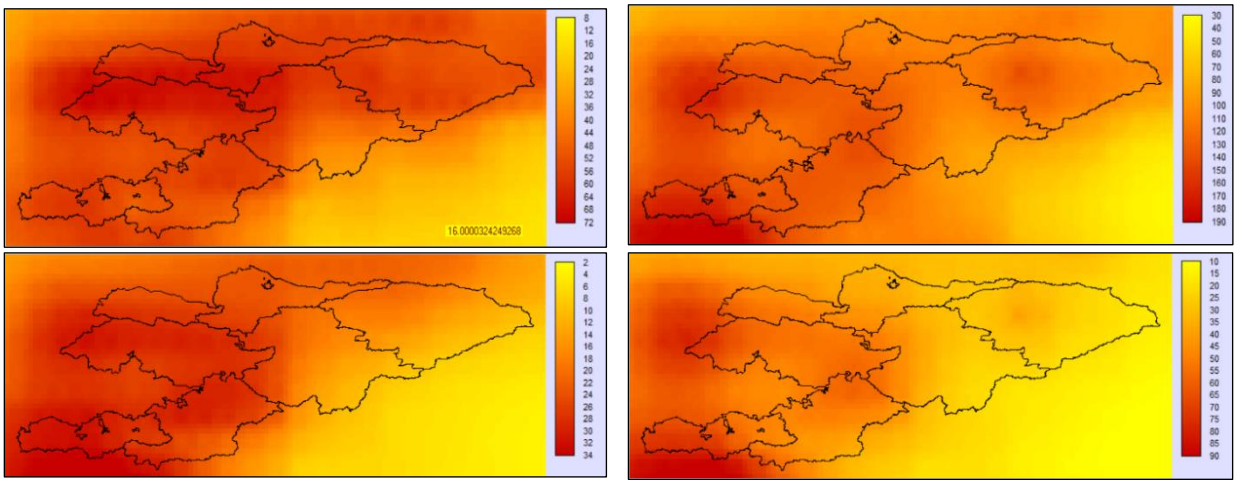


*Figure 3.6. Deviations of mean annual, winter, and summer air temperature (°C) for the period 2041–2060 relative to the 1981–2000 baseline, based on the 32-model CMIP6 ensemble under scenario SSP5-8.5. Top to bottom: annual, winter, summer; left – ensemble mean values, right – ensemble standard deviations.*



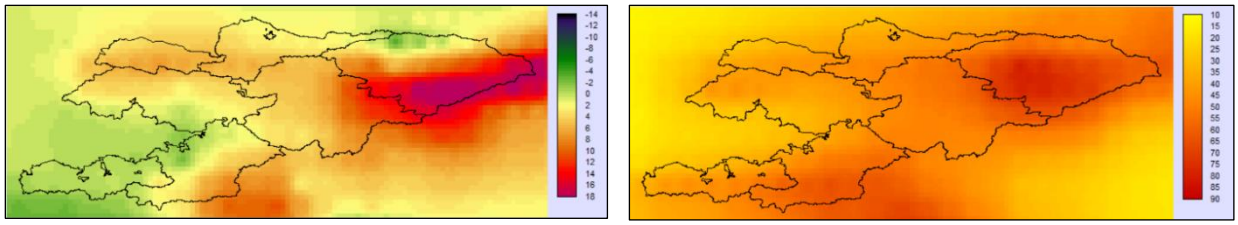


*Figure 3.7. Deviations of precipitation (mm) for the period 2041–2060 relative to the 1981–2000 baseline, based on the 32-model CMIP6 ensemble under scenario SSP2-4.5. Top to bottom: annual, winter, summer; left – ensemble mean values, right – ensemble standard deviations.*

On Figures 3.8 and 3.9 it can be observed that the annual cycle of air temperature deviations across all regions of Kyrgyzstan for all four periods, under each scenario, is nearly identical. However, under scenario SSP2-4.5, a slight difference is noted in the southern regions (Osh and Batken oblasts), where the August maximum is somewhat less pronounced, and in Batken oblast by the end of the century it is even surpassed by the January maximum.

In general, it can be stated that the maximum warming occurs in August, reaching by the end of the century approximately 4°C under scenario SSP2-4.5 and 7°C under scenario SSP5-8.5. A secondary maximum, lower by 0.2–0.5°C, falls on December–January. The minimum occurs in April, amounting by the end of the century to slightly below 3°C under SSP2-4.5 and slightly above 5°C under SSP5-8.5. The second minimum occurs in November, shifting to October by the end of the century, slightly above 3°C for SSP2-4.5 and just below 6°C for SSP5-8.5. It may also be concluded that, by the end of the century, along with the increase in mean annual deviations—from 1.8°C to 6.2°C under SSP5-8.5 and from 1.7°C to 3.5°C under SSP2-4.5—the amplitude of the annual cycle of deviations also increases: from 0.7°C to 2°C under SSP5-8.5 and from 0.7°C to 1.2°C under SSP2-4.5.

Discrepancies between models are relatively small: standard deviations across the ensemble of models do not exceed 40% of the mean values, decreasing to 25–30% by the end of the century.

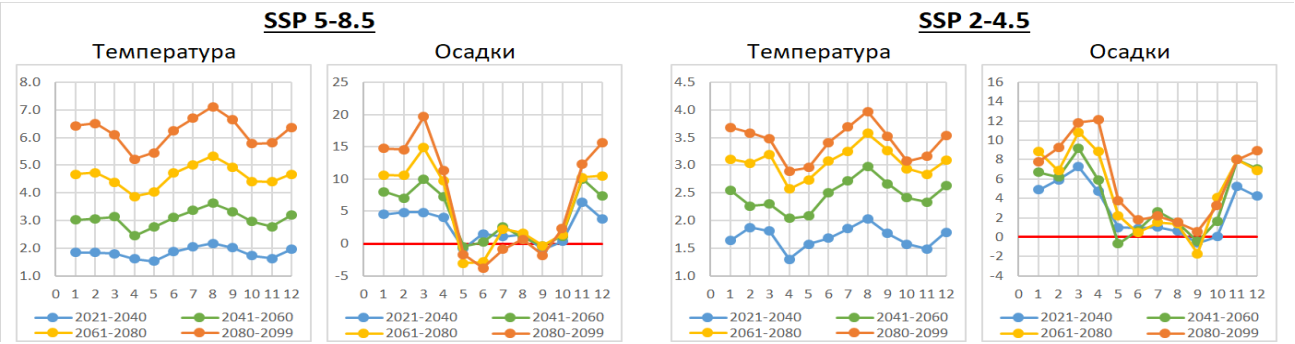



*Figure 3.8. Annual cycle of deviations from the 1981–2000 baseline in air temperature and precipitation under two scenarios for Kyrgyzstan.*

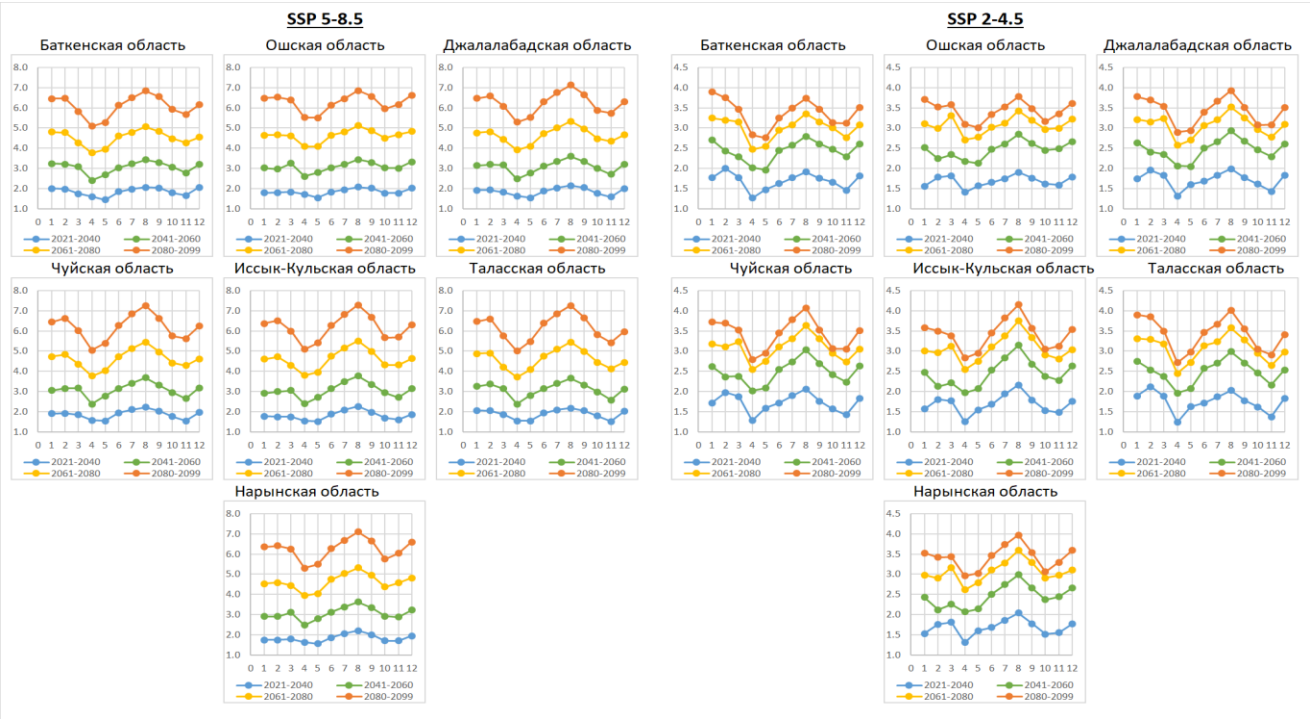



*Figure 3.9. Annual cycle of deviations from the 1981–2000 baseline in air temperature by regions of Kyrgyzstan.*

Precipitation (see Figure 3.10). In this case, the spread of model values is very large, with standard deviations in a number of models exceeding the mean values by a factor of 2 to 5, which makes the reliability of such projections relatively low. On average for Kyrgyzstan, the highest deviations are observed in March, increasing by the end of the century from 5 to 20 mm under the SSP5-8.5 scenario and from 7 to 12 mm under the SSP2-4.5 scenario. A second, somewhat smaller maximum is projected for November, shifting to December by the end of the century. Minimum deviations occur from May to September, with lows specifically in these months, and with the May minimum shifting to June by the end of the century. Under the SSP2-4.5 scenario, the main minimum is projected for September, reaching –2 mm in 2061–2080, while under the SSP5-8.5 scenario, the main minimum occurs in May, reaching –4 mm by the end of the century, in June.

At the regional level, the SSP2-4.5 scenario demonstrates some diversity, particularly in Issyk-Kul Oblast, where the annual amplitude is significantly smaller than in other regions, the main maximum shifts to April, and the May minimum practically disappears by the end of the century. Minimum values in May–June in Batken and Osh Oblasts reach –4 mm.

The SSP5-8.5 scenario presents a more uniform pattern with a substantially larger annual amplitude (up to 33 mm by the end of the century in Batken Oblast) and noticeable negative values in May–June (–5 to –10 mm) in the second half of the century in Batken, Osh, and Jalal-Abad Oblasts. This may have serious negative consequences for the densely populated Osh and Batken Oblasts, where negative deviations in May–June reach up to –10 mm, remain close to zero from July to September, while average precipitation levels are relatively low (in Batken Oblast about 340 mm/year, with May about 60 mm and June about 30 mm; in Osh Oblast about 400 mm/year, with May about 60 mm and June about 40 mm). Should developments follow this scenario, the strong increase in temperature is expected to inevitably lead to a sharp increase in the frequency, duration, and intensity of summer droughts.

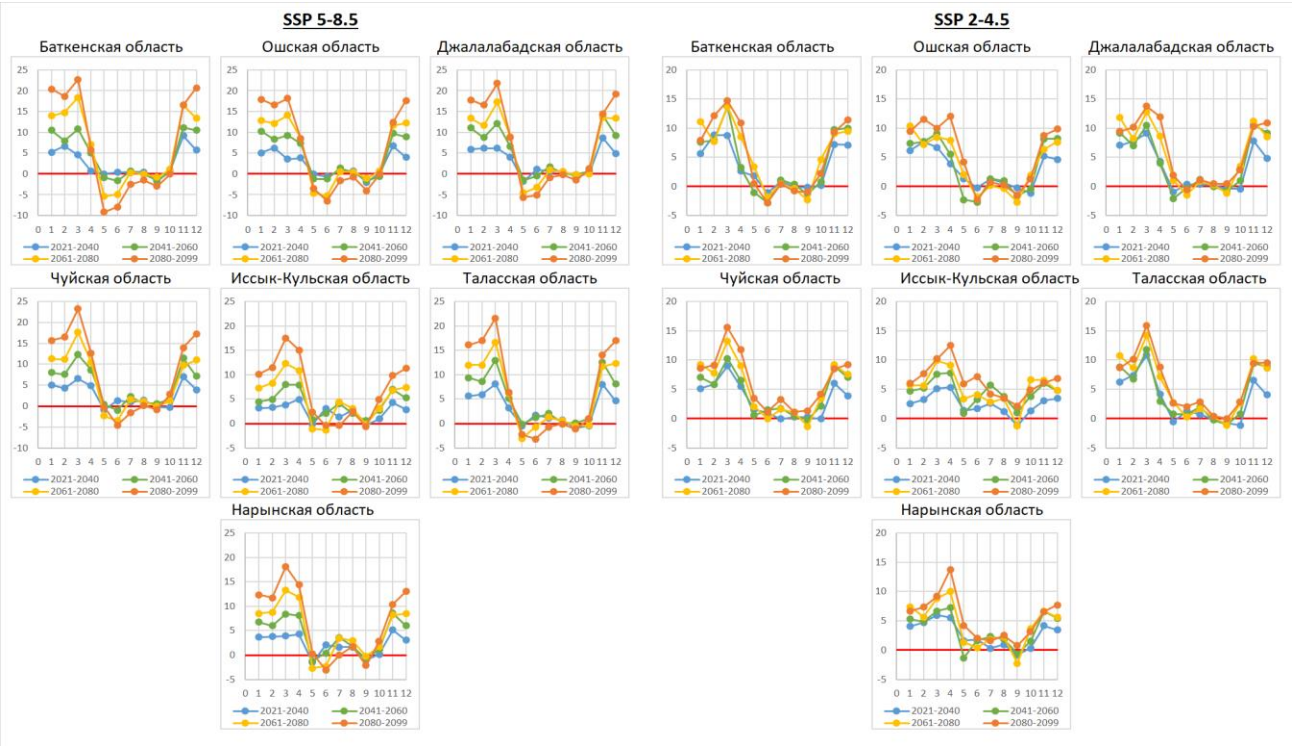



*Figure 3.10. Annual cycle of deviations from the 1981–2000 baseline in precipitation by regions of Kyrgyzstan.*

### 3.3.3 Assessment of Climate Impacts, Risks and Vulnerabilities

In 2023, within the framework of the GEF/UNDP project "Advancing the Development of the National Adaptation Plan (NAP) for Medium- and Long-Term Planning and Implementation of Adaptation Measures to Climate Change in the Kyrgyz Republic" (PID 00117233), a Climate Risk and Vulnerability Assessment (CRVA) was carried out for the most vulnerable sectors: agriculture and irrigation, health, disaster risk reduction, and ecosystems and biodiversity.[246]

The process of developing the CRVA approach and methodology was conducted by the technical expert group of the Central Asian Institute for Applied Geosciences (CAIAG) in close cooperation with stakeholders from the respective sectors and through a series of consultative meetings.

- For the sector "Disaster Risk Reduction" – with the Ministry of Emergency Situations (MES)
- For the sector "Health" – with the Ministry of Health (MoH)
- For the sector "Ecosystems and Biodiversity" – with the Ministry of Natural Resources, Ecology and Technical Supervision (MNRETS)
- For the sector "Agriculture and Irrigation" – with the Ministry of Water Resources, Agriculture and Processing Industry (MWRAPI)
- For regional adaptation plans – with representatives of regional state administrations and sectoral organizations at regional and local levels

To ensure the quality of the approaches, methodologies and tools developed by CAIAG, the UNFCCC national focal point established an Interagency Working Group (IWG). The IWG included all representatives of the above-mentioned institutions as well as representatives of the Government Office of

[246] CAIAG. 2023. Report 1 under the GCF–UNDP Project "Advancing the Process of Developing the National Adaptation Plan (NAP) for Medium- and Long-Term Planning and Implementation of Climate Change Adaptation Measures in the Kyrgyz Republic" (PID 00117233).

the Kyrgyz Republic. It discussed CAIAG's outputs and provided recommendations for their improvement.

In addition to government bodies, the consultative process also engaged representatives of research institutions, civil society, and the private sector, ensuring gender-balanced participation.

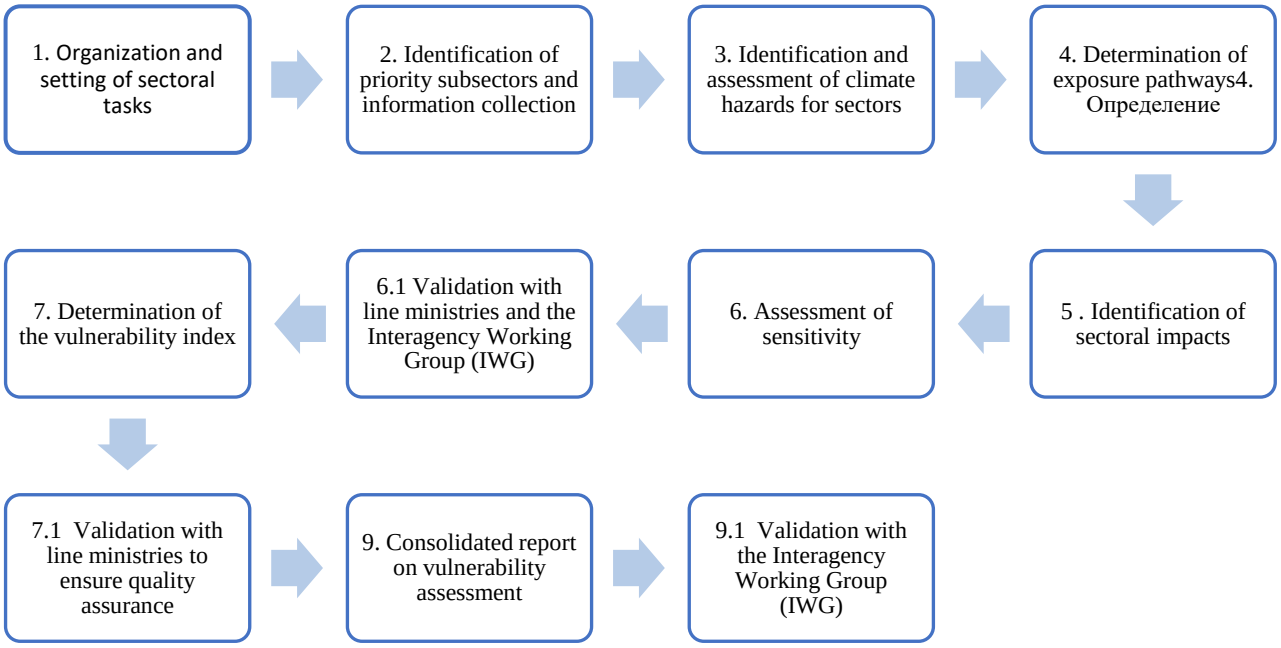



*Figure 3.11. Process of Conducting a Climate Risk and Vulnerability Assessment (CRVA)*

At present, there is no universal methodology for vulnerability assessment that can be applied uniformly across all sectors and countries. Conducting such an assessment requires a sufficiently robust information base of climate observations, data on the dynamics of anthropogenic and ecological systems, and the impacts of climate factors and their combinations.

Long time series of climate data are currently available both at the national level, from the Agency for Hydrometeorology under the Ministry of Emergency Situations, and in international databases (sources of all databases will be presented in subsequent reports).

Data on development dynamics are available in the databases of the National Statistical Committee, as well as in the information systems of line ministries and agencies for the target sectors, and in databases of international internet resources.

However, the application of correlation and regression analysis to long-term data on key sectoral development indicators did not reveal direct dependencies with long-term time series of key climate factors such as temperature and precipitation. The only sector where an indirect relationship with climate factors may be observed is the disaster risk reduction sector. Analysis conducted by the Central Asian Institute for Applied Geosciences (CAIAG) confirmed the conclusions of the Technical Expert Group on Adaptation, developed during the preparation of the Fourth National Communication (NC4), that no direct correlations exist between climate factor changes and the dynamics of key development indicators in the historical analysis of current vulnerability.

Therefore, in the absence of other climate studies for the target sectors of the country, the CAIAG expert group, upon the recommendation of an international expert engaged in the development of the National Adaptation Plan (NAP), decided to assess both current and future sectoral vulnerabilities through the analysis of international climate indices and their impacts on development, drawing on the work of international and national experts of UNDP and the Sixth Assessment Report (AR6) of the

Intergovernmental Panel on Climate Change (IPCC), while interpreting the impacts identified in these documents in the national context.

Numerous publications expand on the key provisions of the IPCC Assessment Reports in this area, adapting them to various national contexts, and noting that the methodology will be improved over time as new data and evidence emerge on the impacts of climate hazards on different sectors.

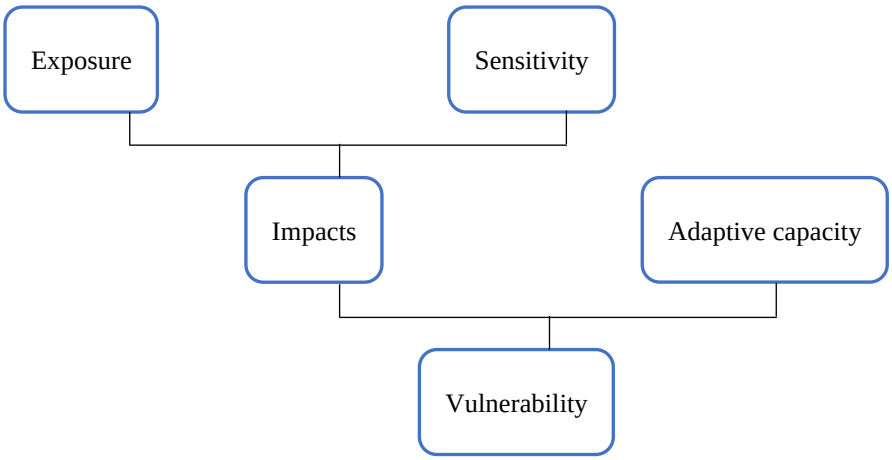



*Figure 3.12. Framework and Key Components of Climate Vulnerability Assessment*

During the analytical process, the Central Asian Institute for Applied Geosciences (CAIAG) developed and tested a Climate Risk and Vulnerability Assessment (CRVA) tool. The tool is based on MS Excel worksheets applying the Multi-Criteria Analysis (MCA) methodology and consists of two parts.

The CRVA of sectors was carried out using three components of vulnerability: Exposure (weight: 30%), Sensitivity (weight: 30%), and Adaptive capacity (weight: 40%).

Part I of the CRVA tool focuses on the assessment of climate risks and vulnerabilities of the target sectors — health, agriculture and irrigation, disaster risk reduction (DRR), and ecosystems and biodiversity. It consists of a set of worksheets reflecting the sequence of the analysis:

1. Analysis of climate hazards
2. Assessment of climate hazards for sectors
3. Assessment of non-climatic vulnerabilities of sectors
4. CRVA of the health sector
5. CRVA of the agriculture and irrigation sector (Agri. & Irrigation)
6. CRVA of the disaster risk reduction (DRR) sector
7. CRVA of the ecosystems and biodiversity sector
8. CRVA indices for the sectors

At the first stage, all climate hazards (CH) resulting from the impacts of physical processes of climate change were assessed. The following criteria were used for the assessment of climate hazards: **frequency, duration, and intensity**. Risk assessments of these hazards were conducted from both a temporal perspective — current (based on emergency statistics) and future (based on expert evaluations obtained through sectoral consultations). On this basis, indices for different types of climate hazards were defined, further analyzed with reference to the target sectors, and subsequently ranked (see Table 3.3).

*Table 3.3. Assessment of Climate Hazards, Current and Future, by Criteria: Composite Index and Ranking*

| Physical Processes | Climate Hazards | Frequency | | Duration | | Intensity | | Total Score | Hazard Index | Ranking |
|---|---|---|---|---|---|---|---|---|---|---|
| | | current | future | current | future | current | future | | | |
| | Floods and mudflows | 0,8 | 1 | 0,4 | 0,6 | 0,6 | 0,8 | 4,2 | 0,70 | 6 |

| Physical Processes | Climate Hazards | Frequency | | Duration | | Intensity | | Total Score | Hazard Index | Ranking |
|---|---|---|---|---|---|---|---|---|---|---|
| | | current | future | current | future | current | future | | | |
| **Increase in precipitation (P+)** | Avalanches | 0,6 | 0,8 | 0,4 | 0,2 | 0,6 | 0,6 | 3,2 | 0,53 | 9 |
| | Landslides | 0,8 | 1 | 0,6 | 0,6 | 0,6 | 0,6 | 4,2 | 0,70 | 7 |
| | Heavy rainfall, hail | 0,4 | 0,4 | 0,4 | 0,5 | 0,6 | 0,8 | 3,1 | 0,52 | 11 |
| **Decrease in precipitation (P−)** | Meteorological drought | 0,4 | 0,6 | 0,6 | 0,8 | 0,4 | 0,6 | 3,4 | 0,57 | 8 |
| | Low-water periods | 0,8 | 1 | 0,8 | 1 | 0,8 | 1 | 5,4 | 0,90 | 2 |
| **Increase in temperature (T+)** | Atmospheric and soil drought | 0,8 | 1 | 0,6 | 0,8 | 0,6 | 0,8 | 4,6 | 0,77 | 5 |
| | Heat waves | 1 | 1 | 0,8 | 1 | 0,8 | 1 | 5,6 | 0,93 | 1 |
| | Wildfires | 0,4 | 0,6 | 0,4 | 0,6 | 0,6 | 0,6 | 3,2 | 0,53 | 10 |
| **Decrease in temperature (T−)** | Frosts | 0,2 | 0,2 | 0,6 | 0,4 | 0,6 | 0,4 | 2,4 | 0,40 | 12 |
| | Spring frosts | 0,2 | 0,2 | 0,2 | 0,2 | 0,4 | 0,4 | 1,6 | 0,27 | 14 |
| **Atmospheric pressure** | High/low pressure anomalies | 0,8 | 1 | 0,8 | 1 | 0,6 | 0,6 | 4,8 | 0,80 | 4 |
| | Hurricane-strength winds | 0,6 | 0,6 | 0,2 | 0,2 | 0,2 | 0,3 | 2,1 | 0,35 | 13 |
| **Solar radiation** | High solar radiation | 1 | 1 | 0,6 | 0,8 | 0,6 | 0,8 | 4,8 | 0,80 | 3 |

Note: The assessment was conducted using a five-point decimal scale: 1.0 – very high; 0.8 – high; 0.6 – medium; 0.4 – low; and 0.2 – very low.

As a result, the climate hazards were ranked by risk level (in descending order):

1. Heat waves
2. Low water availability
3. High solar radiation
4. High/low atmospheric pressure
5. Atmospheric and soil drought
6. Floods and mudflows
7. Landslides
8. Meteorological drought
9. Avalanches
10. Wildfires
11. Heavy rains and hail
12. Frosts
13. Hurricane winds
14. Spring frosts

The results of the Climate Risk and Vulnerability Assessment (CRVA) for the target sectors are presented in Table 3.4.

*Table 3.4. Values of current and future vulnerability indices, composite vulnerability index, and rankings*

| Sector | Current Vulnerability Index | Non-climatic Vulnerability Index | Overall Climate Vulnerability Index | Ranking |
|---|---|---|---|---|
| **Current Vulnerability Indices** | | | | |
| Agriculture and Irrigation | 11.8462 | 0.1321 | 5.9891 | **2** |
| Disaster Risk Reduction | 11.4812 | 0.1411 | 5.8111 | **3** |
| Health | 16.7009 | 0.1522 | 8.4266 | **1** |
| Ecosystems and Biodiversity | 11.3400 | 0.1300 | 5.7350 | **4** |
| **Future Vulnerability Indices** | | | | |
| Agriculture and Irrigation | 17.8224 | 0.1321 | 8.9772 | **2** |
| Disaster Risk Reduction | 17.5082 | 0.1411 | 8.8246 | **3** |
| Health | 21.1250 | 0.1522 | 10.6386 | **1** |

| Sector | Current Vulnerability Index | Non-climatic Vulnerability Index | Overall Climate Vulnerability Index | Ranking |
|---|---|---|---|---|
| Ecosystems and Biodiversity | 16.1229 | 0.1300 | 8.1264 | **4** |
| **Composite Vulnerability Index** | | | | |
| Agriculture and Irrigation | | | 14.9664 | **2** |
| Disaster Risk Reduction | | | 14.6358 | **3** |
| Health | | | 19.0652 | **1** |
| Ecosystems and Biodiversity | | | 13.8614 | **4** |

The table shows that, according to the calculated vulnerability index values, the most vulnerable sector is Health, followed in descending order by Agriculture and Irrigation, Disaster Risk Reduction (DRR), and Ecosystems and Biodiversity.

Part II of the Climate Risk and Vulnerability Assessment (CRVA) tool presents the analysis conducted to assess climate risks and vulnerability of the target oblasts: Batken, Jalal-Abad, and Osh. It consists of a set of worksheets reflecting the sequence of analysis:

1. Analysis of climate hazards
2. Assessment of climate hazards in the oblasts
3. Assessment of non-climatic vulnerability of the oblasts
4. CRVA of Batken oblast
5. CRVA of Jalal-Abad oblast
6. CRVA of Osh oblast
7. CRVA Index of the target oblasts

The results of the CRVA calculations for the target oblasts are presented in Table 3.5 below.

*Table 3.5. Values of current and future vulnerability indices, composite vulnerability index, and rankings of the oblasts*

| Oblast | Current Vulnerability Index | Non-climatic Vulnerability Index | Overall Climate Vulnerability Index | Ranking |
|---|---|---|---|---|
| **Current Vulnerability Indices** | | | | |
| Batken | 8.1915 | 6.7667 | 7.4791 | 2 |
| Jalal-Abad | 10.1849 | 6.7000 | 8.4425 | 1 |
| Osh | 7.0945 | 6.1167 | 6.6056 | 3 |
| **Future Vulnerability Indices** | | | | |
| Batken | 13.3919 | 6.7667 | 10.0793 | 2 |
| Jalal-Abad | 15.6213 | 6.7000 | 11.1607 | 1 |
| Osh | 12.3345 | 6.1167 | 9.2256 | 3 |
| **Composite Vulnerability Index** | | | | |
| Batken | | | 17.5584 | 2 |
| Jalal-Abad | | | 19.6031 | 1 |
| Osh | | | 15.8311 | 3 |

Based on Table 3.5, the calculated values of the vulnerability index indicate that the most vulnerable oblast is Jalal-Abad, followed, in descending order of the index, by Batken and Osh.

## 3.4 Adaptation Priorities and Barriers

### 3.4.1. Adaptation Priorities

The adaptation priorities of Kyrgyzstan to the impacts of climate change were defined in the Second Nationally Determined Contribution (NDC 2) and formulated in accordance with the global adaptation goal under Article 7 of the Paris Agreement. They are directed towards enhancing adaptive capacity and climate resilience in the following sectors:

1. Water resources
2. Agriculture
3. Energy
4. Disaster risk reduction (DRR)
5. Health
6. Transport infrastructure
7. Ecosystems and biodiversity
8. Climate-resilient territories and cities

## 3.5 Strategies, Policies, Plans, Goals and Actions for Mainstreaming Adaptation into National Policy and Strategies

In 2023, within the framework of the GCF/UNDP project "Advancing the National Adaptation Plan (NAP) Process for Medium- and Long-Term Adaptation Planning and Implementation in Kyrgyzstan" (PID 00117233), a number of Sectoral Adaptation Plans (APs) were developed for the most climate-vulnerable sectors of the country:

1. Climate Change Adaptation Plan for the Health sector for 2025–2029;
2. Climate Change Adaptation Plan for the Agriculture and Irrigation sector for 2025–2029;
3. Climate Change Adaptation Plan for the Disaster Risk Reduction sector for 2025–2029;
4. Climate Change Adaptation Plan for the Biodiversity Conservation sector for 2025–2029.

In addition, Adaptation Plans were developed for the three oblasts most vulnerable to climate change: Batken, Jalal-Abad and Osh.

It is important to note that the implementation of adaptation measures under all of the above-mentioned plans depends on the availability of the necessary financing.

In 2024–2025, additional Adaptation Plans were developed for the Energy sector and Climate-Resilient Cities, as well as the National Adaptation Plan (NAP)

### 3.5.1 Climate Change Adaptation Plan for the Health Sector

The long-term goal of adaptation in the health sector to the impacts of climate change is to strengthen the sector's climate resilience against adverse climate impacts through enhanced adaptive capacity and reduced climate vulnerability of the sector's socio-economic development.

The following objectives have been defined to ensure the achievement of this goal:

1. Strengthening the adaptive capacity of the sector
2. Increasing the climate resilience of health and the health sector to climate change
3. Reducing the vulnerability of the sector to the adverse impacts of climate change

To achieve these objectives, the Adaptation Plan (AP) foresees the implementation of the following measures:

**Objective 1: Strengthening the adaptive capacity of the sector**

1. Conduct scientific research on the impacts of climate change on public health in the Kyrgyz Republic and develop relevant guidelines and protocols.

2. Develop action plans for the prevention of and preparedness of the public health (PH) system for climate-related emergencies under projected climate change conditions.
3. Design educational and training programs at pre-/post-graduate levels, as well as continuing education for medical personnel, on the impacts of climate change on human health.
4. Train teaching staff of educational institutions to further deliver courses on the impacts of climate change on human health.
5. Implement the developed educational and training programs on the impacts of climate change on human health at pre-/post-graduate levels, as well as training and retraining of medical personnel, and ensure their delivery.
6. Develop software for collecting data on morbidity and mortality disaggregated by age, sex, and geographic location related to climate change impacts.
7. Integrate the Ministry of Health (MoH) of the Kyrgyz Republic software with other information systems of climate partners.
8. Establish and operationalize a unit for the analysis and forecasting of climate change impacts on public health.
9. Develop biometeorological forecasts and early warning systems for adverse conditions negatively affecting public health, particularly for vulnerable groups at risk (women, children, and persons with health conditions).
10. Conduct an inventory of PH buildings to assess the availability of sanitary and technical facilities and medical service equipment to create safe and climate-resilient conditions for the provision of health services during climate hazards and emergencies.
11. Develop a communication plan and conduct awareness-raising campaigns to enhance population knowledge and skills for protecting human health under conditions of abnormal heat, cold, and preparedness for climate-related emergencies.
12. Review and amend normative legal acts to strengthen financing for health system response measures under climate change conditions.

**Objective 2: Increasing the Climate Resilience of Public Health and the Sector**

1. Strengthen the climate resilience of public health (PH) infrastructure against climate hazards and emergencies, based on findings and recommendations.
2. Equip health care facilities with energy-efficient equipment, instruments, and consumables.
3. Install renewable energy sources (solar panels) in PH facilities.
4. Provide mobile laboratories based on high-cross-country vehicles to ensure timely analysis of water and food samples under climate-related emergencies.

**Objective 3: Reducing the Climate Vulnerability of the Population and the Sector**

1. Conduct vaccination against viral hepatitis A to reduce population vulnerability under climate change conditions.
2. Expand unplanned activities for control and monitoring of drinking water and food quality during adverse extreme climate events.

### 3.5.2 Climate Change Adaptation Plan for the Agriculture and Irrigation Sector

The long-term objective of adapting agriculture and irrigation to the impacts of climate change is to enhance the climate resilience of the sector to adverse climate impacts through strengthening adaptive capacity and reducing the climate vulnerability of the socio-economic development of the sector.

The following objectives have been identified to achieve this goal:

1. Strengthening the adaptive capacity of the sector.
2. Increasing the climate resilience of the sector to climate change.
3. Reducing the vulnerability of the sector to adverse consequences of climate change.

In line with these objectives, the Adaptation Plan (AP) foresees the implementation of the following measures:

**Objective 1: Strengthening the Adaptive Capacity of the Agriculture and Irrigation Sector**

1. Conduct research on the development of new crop varieties and hybrids that are resistant to climate change (drought-resistant, early-ripening, disease- and pest-resistant), with high yields, including forage crops.
2. Carry out scientific research aimed at developing new livestock breeds and improving productivity of animal husbandry adapted to climate impacts such as drought, heatwaves, cold spells, etc.
3. Enhance the capacity of regional research institutions and state breeding farms, and improve the technical and scientific base for cultivating the most climate-resilient crops and livestock breeds.
4. Develop training programmes and build the capacity of stakeholders in the sector on climate change adaptation, including for government agencies and local self-government bodies (LSGBs).
5. Integrate climate change and climate adaptation into agricultural education standards under the Ministry of Education and Science (MES) for the period 2025–2029.
6. Design and implement a comprehensive programme to strengthen farmers' adaptive capacity.
7. Train farmers in cultivating new climate- and salt-tolerant crop varieties, plant protection methods, and related practices.
8. Increase awareness among farmers, pasture users, and other stakeholders in the agricultural sector on adaptation to climate change.
9. Develop a National Pasture Development Programme, incorporating climate change considerations.
10. Conduct research on pasture improvement measures and integrate findings into climate adaptation activities.
11. Develop methodological guidelines for LSGBs on pasture condition assessment under climate change, with subsequent integration into adaptation measures.
12. Provide training for pasture monitoring specialists at LSGB level.
13. Conduct training for specialists in agriculture, veterinary studies, and irrigation (agro-veterinary and irrigation training).
14. Develop methodologies for preparing pasture management and use plans.
15. Train specialists in the preparation of pasture management and use plans.
16. Provide state support for seed production of climate-resilient pasture grasses to improve pasture vegetation under climate change conditions, integrating results into adaptation measures.
17. Develop investment projects to introduce and scale up modern technologies (Geographic Information Systems (GIS), Remote Sensing (RS), etc.) for cultivating climate-resilient cereals, forage, and fruit crops, as well as modern soil management methods.
18. Develop training programmes on new climate-smart technologies (soil tillage, water-saving technologies, agroecology, protective measures for soil fertility improvement, etc.) in the context of climate change.
19. Develop training methodologies and programmes on organic farming (biological plant protection, biohumus, biofertilizers, etc.).
20. Introduce certification of organic production in line with the implementation of the Law on Organic Production.
21. Prepare a state programme on the development of water-saving technologies in the country.
22. Prepare a new Irrigation Development Programme for 2026–2035, taking into account projected river runoff changes associated with climate change.

23. Conduct studies of runoff changes in the Issyk-Kul–Tarim, Naryn–Syrdarya, and Karadarya–Syrdarya–Amudarya basins due to climate change, with the development of practical recommendations.
24. Study groundwater conditions in the Ala-Archa and Alamudun river basins in the context of climate change, with practical recommendations.
25. Establish a Unified Water Information System (UWIS) and a Center for Automation of Water Accounting and Distribution Processes for efficient water use under climate change conditions.
26. Provide material and technical support and build capacity in the adaptation of water resources to climate change at oblast and river basin authority (RBA) levels.
27. Conduct a pilot analysis of transferring Water Users Associations (WUA), Rural Drinking Water Consumer Associations (RADWC), and Pasture Users Associations (PUA) to LSGBs.
28. Amend legislation to ensure open access to hydrological and meteorological data from the Kyrgyz Hydrometeorological Service for public institutions.
29. Develop feed rations with supplements for livestock, taking into account climate change conditions.
30. Develop and update technological charts for major crop types and forage grasses.
31. Produce climate information products, such as agro-meteorological forecasts and pasture forecasts.
32. Compile digital soil maps by districts to assess and monitor the fertility of agricultural land.

**Objective 2: Enhancing the Climate Resilience of the Agriculture and Irrigation Sector**

1. Carry out an inventory of pasture infrastructure for repair, construction, and improvement of pasture-related facilities (bridges, roads, shelters, watering points, etc.) in the context of climate change.
2. Improve the forage base by establishing cultivated pastures under climate change conditions, integrating recommendations into climate adaptation measures, and conducting related research.
3. Expand the network of artificial insemination centers using high-yield animal breeds to improve livestock quality.
4. Establish a state agrochemical laboratory to strengthen the adaptive capacity of peasant farms (PFs).
5. Organize mobile agrochemical laboratories staffed with specialists and equipped with soil analysis kits for remote PFs.
6. Develop a system for analyzing organic production based on existing or newly established laboratories.
7. Increase the production and availability of organic fertilizers (biohumus, compost, biofertilizers, etc.).
8. Expand the production and range of biological products for pest control.
9. Promote the development of seed farms cultivating climate-resilient crops, fruit, and forage varieties to ensure the availability of domestic seed material.
10. Implement measures of the Irrigation Development Programme up to 2026.
11. Construct new and expand existing processing facilities for the preservation and marketing of agricultural products.

**Objective 3: Reducing the Vulnerability of the Agriculture and Irrigation Sector to Climate Change Impacts**

1. Develop normative legal acts (NLAs) and pilot index-based insurance schemes in selected regions, covering both livestock and crop production.
2. Promote diversification of household incomes, shifting from livestock production to poultry farming, fish farming, and beekeeping.

3. Support the development of Value Chains (VCs) within agro-clusters.
4. Foster the development of agrotourism (e.g., cultivation of agricultural crops; animal husbandry and milking; mechanical removal of weeds on pastures; and related activities).

### 3.5.3 Climate Change Adaptation Plan for the Disaster Risk Reduction Sector

The long-term objective of adaptation in the field of disaster risk reduction (DRR) is to enhance the climate resilience of the sector to the adverse impacts of climate change through strengthening adaptive capacity and reducing the climate vulnerability of the sector's socio-economic development.

The following objectives have been defined to achieve this goal:

1. Strengthening the adaptive capacity of the population and the sector.
2. Enhancing the climate resilience of the sector to climate change.
3. Reducing the vulnerability of the sector to the adverse consequences of climate change.

The Adaptation Plan (AP) provides for the implementation of the following measures under each of these objectives.

**Objective 1. Enhancing the Adaptive Capacity of the Population and the Sector**

1. Development of a tool (product) for automating the process of updating calculated indicators of water availability (10%, 5%, 2%, and 1%) in river systems for the purpose of optimizing the design of mudflow protection structures; introduction of the tool and training in its use.
2. Expansion of monitoring and early warning systems at the local level.
3. Improvement of public awareness and training on climate change and adaptation measures.
4. Capacity-building for specialists in disaster risk assessment and reduction at the oblast and district levels.
5. Enhancement of the quality of professional training, including revision and implementation of updated/adapted curricula in educational institutions.
6. Introduction of artificial intelligence technologies for data analysis, forecasting, and mapping of mudflows, landslides, and avalanches.
7. Research and assessment of drought impacts with subsequent application of recommendations.
8. Conducting medical and climate-related studies on the impacts of heat waves and cold waves in each oblast and major cities of the Republic.
9. Expansion of the hydrometeorological observation network, including the extension and automation of hydrological stations across the country.
10. Expansion of avalanche monitoring points to provide predictive snow and avalanche information for all hazardous areas; raising community awareness of avalanche-prone zones.
11. Restoration of the snow survey observation network within Kyrgyzhydromet.
12. Introduction of online satellite monitoring tools for forest fires, including identification, inventory, and accounting of forest stands.
13. Establishment and development of a Comprehensive Disaster Analysis System based on sensors installed on mobile operator towers and early warning systems for earthquakes and climate-related emergencies.
14. Inventory and ownership identification of mudflow protection facilities, including their registration and monitoring.
15. Development (updating) and implementation of a revised system of classification of emergency situations.
16. Creation of a sectoral archive and a digital database within the Ministry of Emergency Situations (MES), with open access for users.
17. Development and implementation of practical safety measures for the population under extreme heat and cold conditions.

18. Modernization of laboratories under the authorized body, including Kyrgyzhydromet, CAIAG, the Department for Monitoring and Forecasting of Emergency Situations, the Mountain Rescue Service, the Forestry Service, and the Fire Supervision Service.
19. Expansion of monitoring networks for air quality in urban areas and water quality using modern equipment.
20. Development and enforcement of standards and monitoring procedures for the maintenance of stormwater drainage and sewerage systems in Osh, Jalal-Abad, and Batken, taking into account the transfer of assets to the balance of local self-government bodies (ayil okmotu).
21. Improvement of the overall legal framework for protecting existing strategic, industrial, and social facilities from the impacts of disasters.
22. Revision and implementation of methodologies for assessing damage from climate-related disasters (buildings, structures, and engineering infrastructure).
23. Forecasting of floods and mudflows through monitoring of the "zero isotherm" line.
24. Development, approval, and implementation of a program for re-inventory (updating) of avalanche-prone areas and hazard zones, including infrastructure located within the hazard zones.
25. Strengthening control mechanisms for ensuring the resilience of planned infrastructure projects to disasters.
26. Development of a mechanism for defining the territories of mudflow protection structures and water protection zones.

**Objective 2. Enhancing the Climate Resilience of the Population and the Sector**

1. Construction and rehabilitation of protective engineering structures against floods and mudflows using pile technologies and innovative construction materials.
2. Strengthening and expanding preventive measures for disaster risk reduction, including the safe passage of floodwaters during the spring–summer period, considered as "non-capital construction."
3. Expansion of programs for the rehabilitation and new construction of mudflow protection structures across the territory of the country, disaggregated by oblasts, districts, and river systems.
4. Comprehensive development of integrated mudflow prevention systems in conjunction with Remote Sensing (RS) technologies.

**Objective 3. Reducing the Climate Vulnerability of the Population and the Sector**

1. Development of insurance mechanisms and risk transfer systems for disasters.
2. Afforestation and tree planting along river protection zones and linear infrastructure.
3. Application of nature-based solutions for the prevention of land degradation (e.g., reduction of gully formation, slope and riverbank erosion).
4. Adoption and implementation of measures for greening household yards, adjacent plots, and municipal territories.
5. Rehabilitation (remediation) and/or restoration of territories affected by hazardous natural processes.
6. Strengthening interagency cooperation and data exchange between the Ministry of Emergency Situations (MES) and other ministries and agencies within the framework of existing legislation.

### 3.5.4 Climate Change Adaptation Plan for the Ecosystems and Biodiversity Sector

The long-term adaptation objective of the ecosystems and biodiversity sector is to enhance its climate resilience to the adverse impacts of climate change by strengthening adaptive capacity and reducing the climate vulnerability of ecosystems and biodiversity.

The following objectives have been identified to achieve this goal:

1. Strengthening the adaptive capacity of the sector.
2. Enhancing the climate resilience of the sector to climate change.
3. Reducing the vulnerability of the sector to the adverse consequences of climate change.

In line with these objectives, the Adaptation Plan (AP) foresees the implementation of the following measures:

**Objective 1. Strengthening the Adaptive Capacity of the Sector**

1. Development of Ecosystem and Biodiversity Conservation Priorities until 2040, taking into account climate change assessments, gender aspects, and the interests of vulnerable groups.
2. Assessment and revision of the Forest Sector Development Concept Action Plan until 2040, incorporating climate change considerations, gender aspects, and the interests of vulnerable groups.
3. Integration of the National Adaptation Plan (NAP), the Forest Sector Development Concept Action Plan until 2040, and the Action Plan on Conservation Priorities into sectoral planning systems (1–5 years).
4. Development of a Specially Protected Natural Areas (SPNA) Development Program until 2040, taking into account climate change considerations, gender aspects, and the interests of vulnerable groups.
5. Assessment of environmental legislation to incorporate adaptation measures.
6. Introduction of amendments and additions to the legislation of the country to integrate climate change issues.
7. Drafting of the Law on Climate Change of the Kyrgyz Republic.
8. Development of technical, legal, and institutional approaches to promote public–private partnerships (PPP) for integrated climate-resilient forest and pasture management.
9. Development of guidelines on strengthening visitor accounting and the procedure for collecting entrance fees in SPNAs.
10. Development of training modules and delivery of training for forestry and SPNA specialists on the implementation of measures under strategic documents in the sectoral planning system.
11. Development of training modules and delivery of training for forestry and SPNA specialists on the implementation of new norms of environmental legislation.
12. Research to develop a predictive model and scenario analysis of the impacts of climate change on key ecosystems, forest pests and diseases, forest fires, shifts in forest boundaries, and forest productivity.
13. Research to assess the current state of ecosystems in the country that are or may become vulnerable to climate change.
14. Dendroclimatological research on the main forest-forming species under changing climate conditions.
15. Research on determining the temperature optimum of coniferous and deciduous species under climate change.
16. Development of a methodology for forest pathology monitoring, production of biological preparations, and entomophages.
17. Development of a methodology for assessing damage from pests, forest fires, and emergency situations.
18. Research on the water-regulating function of forests in river basins.

19. Research on cryogenic processes in forest zones near glaciers.
20. Research on improving methods for supporting natural regeneration under climate change.
21. Research on improving reforestation and afforestation methods for climate change adaptation.
22. Research on the establishment of green forest plantations for the prevention of disaster risks under climate change.
23. Development of a methodology for the economic valuation of biodiversity and ecosystem services under climate change.
24. Research on the impacts of climate change on the biodiversity of wetlands under the Ramsar Convention.
25. Research on the impacts of recreational pressure on Issyk-Kul Lake and forest ecosystems.
26. Research on the vulnerability of high-mountain ungulates to climate change.
27. Research to identify and assess key animal migration corridors under climate change.
28. Research on the impacts of climate change on plant communities and flora of SPNAs.
29. Research on the state of rare and endangered species of flora and fauna.
30. Incorporation of climate change issues into SPNA management plans.
31. Implementation of updated SPNA management plans.
32. Inventory of wildlife reserves.
33. Development of programs and training modules, as well as delivery of training on ecotourism development in SPNAs.
34. Training on the use of the methodology for forest pathology monitoring, production of biological preparations, and entomophages.
35. Training on the use of the methodology for assessing damage from pests, forest fires, and emergency situations.
36. Training on the use of the methodology for the economic valuation of biodiversity and ecosystem services.
37. Training on fire safety in forests of the State Forest Fund (SFF) and SPNAs.
38. Training on reforestation/afforestation and nursery management under climate change.
39. Improvement of forest management technologies considering climate change adaptation.
40. Monitoring, reporting, and verification (MRV) of wildlife using the Spatial Monitoring and Reporting Tool (SMART).
41. Improvement of the forest management information system considering climate change adaptation.
42. Establishment of an information system for SPNAs considering climate change adaptation.
43. Access to and exchange of information on adaptation of biodiversity and forests to climate change.
44. Dissemination of information on the impacts of climate change on forests and biodiversity.
45. Establishment of a national MRV system for forests and pastures.
46. Training on monitoring and evaluation (M&E) of adaptation measures in the sector.

**Objective 2. Enhancing the Climate Resilience of Forest Ecosystems to Climate Change**

1. Strengthening forest protection against pests and diseases through forest pathology monitoring, biological control agents, entomophages, pheromone traps, and other measures.
2. Increasing the fire safety of forest ecosystems through monitoring, fire prevention measures, and strengthening of infrastructure.
3. Reforestation and afforestation to adapt forests to shifting boundaries under climate change conditions.
4. Establishment of high-yield and high-quality forest seed plots across different forest-growing zones.

5. Creation of nursery farms using modern technologies (in-vitro propagation, closed root systems, pallets, etc.).
6. Expansion of State Forest Fund (SFF) lands by incorporating forests growing outside the current SFF boundaries.
7. Strengthening the capacity of Specially Protected Natural Areas (SPNAs) to protect against forest violations and fires.
8. Establishment of a unified system for monitoring the health of wildlife in the country.
9. Relocation of plant and animal species, including endangered species, into cultivation conditions, botanical gardens, reserves, seed banks, and other facilities.
10. Restoration of populations of gazelles, wild asses, and saiga antelopes through reintroduction.
11. Establishment of a rehabilitation center for the conservation of the snow leopard.
12. Creation of new SPNAs, including through the designation of certain glaciers as protected areas.
13. Expansion of existing SPNAs, taking into account climate change.
14. Establishment of migration and ecological corridors between new and existing SPNAs for key wildlife species.
15. Creation of SPNAs at the level of local self-government bodies (LSGBs).

**Objective 3. Reducing the Vulnerability of the Sector to the Adverse Impacts of Climate Change**

1. Diversification of household income sources for communities living in and around walnut-fruit forests and SPNAs, taking into account gender aspects and the interests of vulnerable groups.
2. Improvement of value chains for forest resources.
3. Promotion of green investments for pasture restoration.
4. Development of ecotourism in SPNAs, including through public–private partnerships (PPPs).
5. Establishment of fruit plantations on low-productivity agricultural lands using agroforestry methods.

## 3.6 Progress in the Implementation of Adaptation

Since the Adaptation Plans of the target sectors and regions are designed for the period 2025–2029, progress in their implementation could not be assessed within the framework of this Biennial Transparency Report.

Furthermore, the full implementation of the aforementioned sectoral and regional APs will only be possible subject to the availability of international support.

## 3.7 Monitoring and Evaluation of Adaptation Actions and Processes

The monitoring and evaluation system for adaptation actions in the country is still in its formative stage and requires support in terms of systemic, institutional, and individual capacity-building.

The M&E system will be based on the sectoral and regional Adaptation Plans and will utilize the information and indicators embedded therein.

Monitoring of the implementation of these plans is carried out through the indicators included in the adaptation action tables, with data collection conducted by the institutions responsible for sectoral and regional adaptation, as specified in the AP tables.

Evaluation of adaptation actions and processes, as well as preparation of the national climate reporting on adaptation, will be undertaken by the UNFCCC focal point.

## 3.8 Information on the Prevention and Reduction of Loss and Damage Associated with Climate Change Impacts

Every year, dozens of mudflows occur in different regions of the country, destroying roads, residential buildings, and social infrastructure, and causing damage to rural communities and farmers.

Therefore, disaster risk reduction (DRR) has been given high priority in the country. In 2013, the Ministry of Emergency Situations (MES) and the Secretariat of the Civil Platform on DRR of the Kyrgyz Republic, with the support of the World Bank (WB) and the Global Facility for Disaster Reduction and Recovery (GFDRR), developed the Methodological Guidelines for the Assessment of Damage, Losses, and Needs for Reconstruction and Recovery from Emergencies in the Kyrgyz Republic.

In 2018, mandatory state statistical reporting on disaster-related damage was introduced in the form of Damage Report Form No. 1 – Emergencies.

In 2019, the Government of the country approved the Procedures for Assessing Damage from Emergencies.[247]

n 2022, the inter-agency group of the National Platform on DRR, with the support of international and national consultants and experts from the Food and Agriculture Organization of the United Nations (FAO), and under the FAO project Institutionalization of the Methodology for Damage and Loss Assessment in the Agricultural Sector in the Kyrgyz Republic, developed the Methodological Guidelines for Damage and Loss Assessment in Agriculture of the Kyrgyz Republic. This methodology, adapted from FAO's global approach, provides a framework for determining, analyzing, and assessing the impacts (damage and losses) of disasters on the agricultural sector and is aligned with the United Nations system for data collection and monitoring progress towards global resilience targets, particularly Indicator C2 of the Sendai Framework and Indicator 1.5.2 of the Sustainable Development Goals (SDGs) (direct agricultural losses attributed to disasters). In 2024, the Cabinet of Ministers of the country, with the aim of standardizing disaster damage assessment, systematizing disaster accounting, and strengthening post-disaster recovery, approved: The Procedures for Assessing Damage from Emergencies or Incidents and Systematizing Disaster Accounting; and The Procedures for Implementing Disaster Response and Recovery Measures.[248]

Nevertheless, despite the efforts undertaken by the country, the scale of climate-induced natural disasters, as well as the losses and damages they cause, continues to increase. The country lacks sufficient resources both to compensate and support affected populations and to restore destroyed infrastructure.

## 3.9 Cooperation, Best Practices, Experiences and Lessons Learned on Adaptation

The United Nations Development Programme (UNDP) and other United Nations agencies provide significant support to the Kyrgyz Republic in adapting to the impacts of climate change. This support is directed both towards strengthening the systemic capacity of the country through the development of climate legislation and policies, as well as at the field level in enhancing the adaptive capacity of vulnerable sectors, local communities, and groups.

[247] Resolution of the Government of the Kyrgyz Republic No. 597 of 11 November 2019.
[248] Resolution of the Cabinet of Ministers of the Kyrgyz Republic No. 77 of 22 February 2024.

The Food and Agriculture Organization of the United Nations (FAO) is assisting the Kyrgyz Republic in institutionalizing its methodology for assessing direct economic losses associated with disasters in agriculture (crop production, livestock, fisheries, forestry, and aquaculture). This work includes embedding the methodology into sectoral and national information systems on damage and losses to ensure systematic and consistent data collection.

To enable the analysis of locally collected data and the presentation of information on damage and losses in the agricultural sector, FAO has supported the development of the electronic Damage and Loss Assessment tool (e-DLA). The e-DLA is an innovative and customizable integrated digital solution that allows for the allocation of roles in accordance with institutional systems and territorial organizational structures at the local level.

The German Agency for International Cooperation (GIZ), working actively with local authorities, organizations, and water user associations in selected river basins in the region, is supporting the development of adaptation plans that take into account priority transboundary measures and reliable early warning systems for hydrological disasters. With GIZ support, dialogue platforms and forums have fostered comprehensive discussions on opportunities for regional cooperation. In October 2022, a regional conference entitled "Youth for the Future" was held in the Kyrgyz Republic, bringing together 50 eco-activists and professionals aged 18 to 30 from Central Asia, Afghanistan, and Germany to share knowledge, experiences, and aspirations for building a low-carbon and climate-resilient future.

In addition, GIZ has supported the Kyrgyz Republic in mainstreaming the ecosystem-based approach into national policies and adaptation strategies. This approach has been tested in selected high-mountain villages of the country. In cooperation with the public foundation CAMP Alatoo, climate projections were developed, and adaptation measures were introduced in pilot regions to help preserve ecosystems and prepare communities for expected and actual climate impacts. Residents apply the knowledge gained through training to combat soil erosion, use water resources rationally, produce biohumus (organic fertilizer), and more.

With GIZ support, cost-effective afforestation plans have also been developed for several pilot sites. These sites were identified using historical mapping, and the plans were prepared in accordance with international requirements.

Multilateral development banks provide assistance to the Kyrgyz Republic in strengthening the resilience of critical infrastructure to climate impacts, as well as in enhancing adaptive capacity.

The International Fund for Agricultural Development (IFAD) supports the agricultural sector by building capacity for pasture management, improving the climate resilience of livestock farming, and enhancing access of local communities to markets.

All operating entities of the UNFCCC financial mechanism (the Global Environment Facility, the Green Climate Fund, and the Adaptation Fund) provide financial resources to various international development partners for the implementation of adaptation projects in the Kyrgyz Republic.

Further details on climate-related cooperation are provided in Chapter 4.

# 4. Information on financial, technology development and transfer and capacity-building support needed and received under Articles 9-11 of the Paris Agreement

## 4.1 National circumstances, institutional arrangements and country-driven strategies

Climate change is already having a tangible impact on the Kyrgyz Republic, with accelerated glacier melt and more frequent extreme weather events (abnormal precipitation, floods, landslides, droughts, etc.), leading to increasing climate risks for agriculture, water resources, and vulnerable population groups[249] As a mountainous country with a below-middle-income level, the Kyrgyz Republic has a particular need for international support to advance adaptation and low-carbon development.[250].

The country declared enhanced climate ambition in its Nationally Determined Contribution (NDC) 2.0 (2021), which foresees an unconditional reduction of net greenhouse gas (GHG) emissions by 16.63% in 2025 and 15.97% in 2030 compared to the Business-as-Usual Scenario (BAU). **With international support, GHG emissions are expected to be reduced by 36.61% by 2025 and by 43.62% by 2030 compared to the BAU scenario.**

These targets are integrated into key national strategic documents, such as the National Development Strategy until 2040, the Kyrgyzstan Development Programme until 2030, the Green Economy Development Programme, as well as the Concept on Achieving Carbon Neutrality of the Kyrgyz Republic by 2050, accompanied by a detailed action plan.[251]

Institutional development in the area of climate policy implementation and climate finance infrastructure has been reflected in the following documents:

- Resolution of the Cabinet of Ministers (CM) of the Kyrgyz Republic of 8 April 2022, No. 197 “On Amendments to the Resolution of the Government of the Kyrgyz Republic ‘On the Coordinating Council on Climate Change, Ecology and Green Economy’ of 30 January 2020, No. 46”;[252]
- Regulation on the Climate Finance Center under the Cabinet of Ministers of the Kyrgyz Republic;[253]
- Resolution of the Government of the Kyrgyz Republic of 14 August 2017, No. 478 “On the Establishment of the Climate Finance Center of the Kyrgyz Republic”; [254]
- Resolution of the Government of the Kyrgyz Republic of 30 January 2020, No. 46 “On the Coordinating Council on Climate Change, Ecology and Sustainable Development.” [255.]

[249] World Food Program, 2022. In the Kyrgyz Republic, the Green Climate Fund and WFP team up to support vulnerable communities through climate services and climate sensitive livelihoods. Просмотрено 18/07/2025 https://www.wfp.org/news/kyrgyz-republic-green-climate-fund-and-wfp-team-support-vulnerable-communities-through-climate

[250] NDC of the Kyrgyz Republic 2.0.

[251] Resolution of the Cabinet of Ministers of the Kyrgyz Republic No. 397 of 3 July 2025 “On the Approval of the Concept for Achieving Carbon Neutrality of the Kyrgyz Republic and the Action Plan for the Implementation of its First Stage.”

[252] https://cbd.minjust.gov.kg/159102/edition/1169203/ru

[253] Resolution of the Cabinet of Ministers of the Kyrgyz Republic No. 649 of 5 December 2023 “On the Climate Finance Center under the Cabinet of Ministers of the Kyrgyz Republic.” https://cbd.minjust.gov.kg/7-25149/edition/5722/ru?lang=ru

[254] https://www.gov.kg/ru/npa/s/743

[255] https://cbd.minjust.gov.kg/159127/edition/1168345/ru

The national authorized body on climate-related issues and cooperation with the Green Climate Fund (GCF) is the Ministry of Natural Resources, Ecology and Technical Supervision (MNRETS) of the Kyrgyz Republic (KR). The Ministry of Finance (MoF) and the Ministry of Economy and Commerce (MEC) are also engaged in financing and reporting, particularly with regard to the integration of climate priorities into the national budget and development plans.

The Climate Finance Center (CFC), established in 2017 and transferred under the authority of the Cabinet of Ministers (CM) of the Kyrgyz Republic in 2023, performs a coordinating role in mobilizing and allocating international climate finance. The key Objectives of the CFC include the development and promotion of climate projects, mobilization of investments from the Green Climate Fund and other sources, as well as interaction with government agencies, international organizations, the private sector, and academic institutions to support the implementation of climate policy and resource mobilization.

To ensure direct access to international climate finance and enhance the effectiveness of climate project implementation, the Community Development and Investment Agency (ARIS) completed the accreditation process with the Green Climate Fund in 2024. [256] This accreditation will accelerate the implementation of priority measures, improve transparency and accountability in the use of funds, and strengthen the institutional and managerial capacity of the country in the area of climate finance. [257] Accreditation of ARIS provides the Kyrgyz Republic with direct access to GCF financing for projects of up to USD 50 million.[258]

An important role in advancing climate finance in the Kyrgyz Republic is played by the Green Taxonomy. [259] This instrument defines unified criteria for "green" activities and investments, thereby facilitating the attraction of additional capital sources, the development of green financial instruments, the prevention of greenwashing, and the promotion of sustainable public procurement. The taxonomy covers priority sectors, including renewable energy sources (RES), energy efficiency, sustainable transport, water conservation, waste recycling, sustainable agriculture and forestry, as well as biodiversity conservation. The document has been adapted to international standards and national legislation, which enables the integration of climate measures into the country's economic strategy.

The system of "green" budget expenditure tagging, introduced by the Ministry of Finance (MoF) of the Kyrgyz Republic with the support of the World Bank (WB), represents an important step towards identifying and monitoring the use of budgetary resources allocated to climate and environmental activities. In turn, this will enhance transparency and accountability in the allocation of public resources and facilitate the attraction of international climate finance.

Between June 2024 and March 2025, the tagging methodology was successfully piloted in two ministries—the Ministry of Natural Resources, Ecology and Technical Supervision (MNRETS) and the Ministry of Emergency Situations (MES). The methodology takes into account the risks of double counting and enables monitoring of public expenditures on climate-related measures. Going forward, the Ministry of Finance intends to extend the "green" expenditure tagging system to other pilot ministries.

[256] https://www.greenclimate.fund/ae/aris?utm_source
[257] https://www.greenclimate.fund/document/accreditation-master-agreement-between-gcf-and-aris?utm_source
[258] https://www.greenclimate.fund/ae/aris?utm_source
[259] Resolution of the Cabinet of Ministers of the Kyrgyz Republic No. 246 of 30 April 2025 "On the Approval of the Pilot Nationwide Classifier – the Green Taxonomy of the Kyrgyz Republic."

The national climate finance system of the Kyrgyz Republic is being gradually developed with a strong focus on mobilizing private capital. The country has introduced tax incentives aimed at supporting the climate agenda and attracting private investment into priority sectors such as renewable energy, energy efficiency, and the development of electric transport. In particular, new producers of energy from renewable energy sources (RES) are exempt from profit tax for a period of up to five years;[260]; imports of equipment for RES, including solar and wind installations, are exempt from value-added tax (VAT).[261] Energy-efficient buildings benefit from a 50% reduction in property tax. [262] Equipment for electric vehicle (EV) charging stations and EVs themselves are exempt from VAT and property tax.[263] The incentives provided under tax legislation play an important role in mobilizing private climate investments and facilitating the transition to a low-carbon economy.

In order to stimulate the mobilization of extra-budgetary resources, mechanisms for supporting private sector "green" investments are being implemented. These include the provision of tax incentives and the launch of concessional credit lines (for example, the Kyrgyz Sustainable Energy Financing Facility (KyrSEFF) program of the European Bank for Reconstruction and Development (EBRD), supported by the Asian Development Bank (ADB), for financing energy efficiency, renewable energy sources (RES), sustainable housing, and transport). In addition, with the active involvement of international partners, mechanisms to further stimulate private "green" investments are planned to be introduced. In April 2025, a joint project of the World Bank (WB) and the Asian Infrastructure Investment Bank (AIIB) entitled "Development of the Sustainable Finance Market for Small and Medium Enterprises" was approved. The project provides for the establishment of a National Green Finance Fund and the introduction of a partial "green" guarantee mechanism through the Guarantee Fund to support lending to small and medium-sized enterprises (SMEs). The combination of direct financing of environmental initiatives with risk-reduction instruments is expected to mobilize up to USD 148 million in private capital over a five-year period.[264]

In June 2025, a project of the United Nations Development Programme (UNDP), implemented with the support of the Green Climate Fund (GCF), was launched to strengthen the capacity of the financial sector in the area of climate finance.[265] The project aims to establish a national system for monitoring and verification of climate finance and to provide training for specialists of commercial banks, as well as to develop enabling regulatory measures and risk-sharing mechanisms to expand "green" lending. Within the framework of this initiative, practical guidance will be provided on the application of the Green Taxonomy, and support will be extended for the preparation of bank project proposals to access financing from the GCF and other sources. Such measures reinforce transparency and a systemic approach in the fulfillment of the Kyrgyz Republic's climate commitments.

The market for sustainable financial instruments in the country is only beginning to emerge. Thus, in June 2025, the commercial bank KICB carried out the first issuance of "sustainable" bonds denominated in the national currency, aimed at financing green and social projects. The International Finance Corporation (IFC) supported this issuance and invested up to USD 15 million in the first sustainable development bonds in the history of the Kyrgyz Republic. This issuance represented a significant step in advancing sustainable finance and set a precedent for the introduction of innovative market-based mechanisms oriented, inter alia, toward climate objectives. The targeted proceeds from the bonds will

[260] Tax Code of the Kyrgyz Republic, Article 239.
[261] Tax Code of the Kyrgyz Republic, Article 297 and Resolution of the Cabinet of Ministers of the Kyrgyz Republic No. 196 of 4 October 2021 "On the Approval of the List of Specialized Goods and Equipment Intended for the Construction of Energy Installations Based on the Use of Renewable Energy Sources, Exempt from Value-Added Tax (VAT) upon Import into the Territory of the Kyrgyz Republic."
[262] Tax Code of the Kyrgyz Republic, Article 409.
[263] Ibid., Articles 291, 297, 409.
[264] https://www.worldbank.org/en/news/press-release/2025/04/18/advancing-sustainable-finance-for-micro-small-and-medium-enterprises-in-the-kyrgyz-republic
[265] https://www.undp.org/ru/kyrgyzstan/press-releases/government-and-undp-launch-project-strengthen-national-capacity-green-and-climate-finance

expand lending to local small enterprises, energy efficiency initiatives, and renewable energy projects, thereby engaging the private sector in achieving the country's climate goals.[266].

All of this requires the establishment of a cross-sectoral system for monitoring climate support. However, certain institutional and regulatory gaps remain: the absence of an approved accounting methodology, weak inter-agency coordination, fragmented data and manual collection of reports, insufficient information on private sector participation (no mechanism for declaring "green" investments), as well as risks of double counting due to the current lack of a verification system for climate reporting.

Thus, national mechanisms for monitoring the support required and received are beginning to develop in the Kyrgyz Republic, and the foundations for mobilizing climate finance have been laid. At the same time, in order to achieve the targets, set under the Nationally Determined Contribution (NDC), it is essential to significantly scale up resource mobilization, including private investment, and to strengthen the institutional framework.

## 4.2 Basic Assumptions, Definitions and Methodologies

The definitions and assumptions applied in this Report are consistent with the guiding documents of the United Nations Framework Convention on Climate Change (UNFCCC). In presenting information on climate finance, measures related to climate change mitigation, adaptation to climate change impacts, and cross-cutting (integrated) measures affecting both adaptation and mitigation simultaneously were taken into account. Financial flows were classified by channels (bilateral, multilateral, regional) and by types of instruments (grants, concessional and non-concessional loans).

The assessment of required financial support was conducted on the basis of the mitigation and adaptation measures plan under the Nationally Determined Contribution (NDC) 2.0 (2021), submitted by the Kyrgyz Republic. The cost of specific NDC measures was determined in 2021 prices and agreed with the relevant ministries. The assessment of needs also took into account the budget of adopted state programs. In addition, in assessing the needs for adaptation measures, the cost estimates of the National Adaptation Plans (NAPs) by sector, developed in 2024 and calculated in the same year's prices, were applied. For cost calculations related to forecasts or long-term assessments, assumptions of constant prices adjusted for the inflation rate were used. According to the national cost assessment methodology for the implementation of planned measures, calculations are presented both in the national currency and in United States dollars (USD) at the official exchange rate of the National Bank of the Kyrgyz Republic (NBKR)[267] at the time of calculation.

**Methods of Data Collection for the Biennial Transparency Report (BTR).** Data on support received are presented for the period 2017–2024. The period starting from 2017 was selected because 2017 serves as the baseline year for the preparation of the Nationally Determined Contribution (NDC) 2.0 (2021). In the absence of a unified national digital platform for tracking climate finance, and in order to avoid double counting and ensure the accuracy of the data, several complementary approaches were applied in preparing the Report. Thus, data for 2017–2023 were derived from the Organisation for Economic Co-operation and Development (OECD) database on climate-related development finance (reports in the CRDF-RP format from the recipient's perspective)[268]. Grants and concessional loans directed towards climate-related projects and initiatives were included in the accounting, based

[266] https://www.ifc.org/en/pressroom/2025/ifc-invests-in-kyrgyz-republic-s-first-sustainability-bond-to-support-green-and-so

[267] Exchange rate of the US dollar against the Kyrgyz som: at the end of 2021 = 84.7586; at the end of 2023 = 89.0853; at the beginning of 2025 = 86.9963.
Website of the National Bank of the Kyrgyz Republic: https://www.nbkr.kg/index1.jsp?item=1562&lang=RUS&valuta_id=15&beg_day=01&beg_month=01&beg_year=2021&end_day=31&end_month=01&end_year=2025.

[268] OECD website:https://www.oecd.org/en/data.html

on the Rio markers. Data for 2024 were collected from a variety of sources, such as the International Aid Transparency Initiative (IATI), open data of the Green Climate Fund (GCF), and information officially submitted.

Since the reporting data in international databases is in US dollars, the official exchange rate of the National Bank of the Kyrgyz Republic for July 2025 was used to make sure the data in national currency is comparable.

## 4.3 Information on Financial Support Needed

The needs for international support required for the implementation of climate measures in the Kyrgyz Republic were comprehensively assessed during the preparation of the Updated Nationally Determined Contribution (NDC) (2021) and other strategic documents. The country has identified priority sectors and indicative volumes of resources needed to achieve the established mitigation and adaptation targets. The total financial requirement for climate action up to 2030 has been estimated at USD 10.1 billion, of which a substantial share is expected to be provided from international sources due to the limited availability of domestic resources.

Information on the support required for the implementation of mitigation and adaptation measures under the NDC is presented in Table 4.1.

*Table 4.1. Support Required for the Implementation of Climate Actions*

| Sector | Total Needs (USD million) | Available Resources (USD million) | Support Required (USD million) | Notes |
|---|---|---|---|---|
| **Mitigation Measures** | | | | |
| Energy | 7,155.8 | 2,857.1 | 4,298.7 | Renewable Energy Sources (RES), grid modernization, energy efficiency |
| Land Use, Land-Use Change and Forestry (LULUCF) | 63.0 | 36.2 | 26.8 | Reforestation, sustainable land use |
| Agriculture | 11.6 | 4.5 | 7.1 | Biogas, manure management, soils |
| Industrial Processes and Product Use (IPPU) | 0.55 | 0.1 | 0.45 | Advanced emission control methods |
| Waste | 3.8 | 0.5 | 3.3 | Improved waste management system |
| **Total Mitigation** | **7,234.8** | **2,898.4** | **4,336.4** | |
| **Adaptation Measures** | | | | |
| Water Resources | 1,977.7 | 577.1 | 1,400.6 | Irrigation modernization, drinking water supply |
| Agriculture | 276.0 | 83.0 | 193.0 | Agrotechnologies, insurance, training |
| Energy | 64.9 | 25.2 | 39.7 | |
| Health | 144.1 | 2.7 | 141.4 | Infrastructure, epidemiological surveillance |
| Disaster Risk Reduction (DRR) | 309.9 | 121.9 | 188.0 | Early warning systems, avalanches, floods |
| Forests and Biodiversity | 46.2 | 4.0 | 42.2 | Biodiversity and forest conservation |

| Sector | Total Needs (USD million) | Available Resources (USD million) | Support Required (USD million) | Notes |
|---|---|---|---|---|
| Climate-Resilient Areas and Green Cities | 13.45 | 2.25 | 11.2 | Sustainable cities, local adaptation measures |
| **Total Adaptation** | **2,832.2** | **816.1** | **2,016.1** | |
| **Total under NDC-2** | **10,067.0** | **3,714.5** | **6,352.5** | |

Thus, for the implementation of greenhouse gas (GHG) emission reduction measures by 2030, the estimated total costs amount to approximately USD 7.2 billion. Of this, about 40% (USD 2.9 billion) was expected to be covered by domestic resources (public investments, the private sector, and already available international finance), while 60% (USD 4.3 billion) represented the financing gap requiring international support and investments. The largest share of the required resources falls on the energy sector, with total costs exceeding USD 7.1 billion, of which around USD 4.3 billion was expected to be covered by external sources (projects in renewable energy, grid modernization, energy efficiency improvements, etc.). A significant need was also identified in the forestry and land-use sector, amounting to USD 63.0 million, including USD 26.8 million of external support required for reforestation programs, expansion of forest cover, sustainable land management, and carbon sequestration by ecosystems.

In the agriculture sector, USD 11.6 million was required to implement emission reduction measures (for example, through biogas plants (BGPs), improved manure management, and soil carbon conservation), of which USD 7.1 million was expected to be mobilized from external sources. Relatively small needs for international support were identified for the industrial processes sector (USD 0.45 million) and the waste sector (USD 3.3 million for improving waste management systems).

For the implementation of climate change mitigation measures under the Nationally Determined Contribution (NDC) 2.0, support was also envisaged in the form of technology transfer and capacity building. Particular attention was given to modern solutions in renewable energy (solar installations, small hydropower plants, energy storage systems), energy efficiency (building insulation, energy-efficient stoves), climate-resilient agriculture (drought-resistant crop varieties, drip irrigation), as well as climate monitoring systems (radar-based meteorological stations, satellite technologies). NDC measures in the energy and industrial sectors included components of technological support, digitalization, and modernization. In addition, training activities were foreseen to prepare local specialists for the operation and maintenance of the introduced technologies. These directions were considered an integral part of climate action and require further support from international partners, including grant and concessional financing, as well as private sector participation through guarantees and co-financing mechanisms.

The financial needs for adaptation measures under the Nationally Determined Contribution (NDC) up to 2030 were estimated at USD 2.83 billion. Of this, only about 29% (USD 0.8 billion) was expected to be covered from national resources (including budgetary allocations and ongoing public investments), while approximately 71% (USD 2.01 billion) represented additional needs, primarily from international sources.

The most capital-intensive area is adaptation in the water resources sector. The need for strengthening water security was estimated at around USD 2.0 billion, of which over USD 1.4 billion (about 70%) constituted additional needs to be met through international sources. These funds were envisaged for the modernization of irrigation systems, construction of reservoirs and drinking water supply systems, and improvement of water resources management in the context of climate change.

The second largest block is agricultural adaptation. The financial need for adaptation in this sector—through the introduction of climate-resilient agrotechnologies (drought-resistant crops, new irrigation

systems, agroforestry), crop insurance, and farmer capacity building—was estimated at USD 276 million, of which USD 193 million was expected to be mobilized through additional international support.

The financial requirement for adaptation measures in the health sector amounted to USD 144.1 million, with a gap of USD 141.4 million anticipated to be covered by international support. This need is linked to strengthening the health system to address climate risks (epidemiological surveillance, infrastructure for extreme heat, etc.).

For disaster risk reduction (DRR)—including meteorological and hydrological services, early warning systems, avalanche and flood protection—the estimated need was USD 309.9 million, of which USD 188 million was expected to be provided by development partners.

The financial requirement for forest and biodiversity conservation was USD 46.2 million, of which USD 42.2 million was expected to be covered by international support. For the development of climate-resilient regions and green cities, the financial need was estimated at USD 13.5 million, of which USD 11.2 million was anticipated from international sources.

It should be noted that the Kyrgyz Republic is currently in the process of updating its Nationally Determined Contribution (NDC) 3.0, which will also include cost estimates and updated information on the required support.

In addition, in 2024, with the support of the United Nations Development Programme (UNDP) and the Green Climate Fund (GCF), Adaptation Plans (APs) were developed for four priority sectors for the period 2025–2029, which set out priority measures. Table 4.2 presents the key parameters of the support required for the implementation of the APs for the four sectors.

*Table 4.2. Support Required for the Implementation of Adaptation Plans in Priority Sectors*

| Sector | Total Needs (USD million) | Available Resources (USD million) | Support Required (USD million) | Notes |
|---|---|---|---|---|
| Agriculture and Irrigation | 77.0 | 57.7 | 19.3 | Infrastructure, equipment, research, capacity building |
| Health | 57.1 | 33.4 | 23.7 | Infrastructure, equipment, epidemiological surveillance, research, capacity building |
| Disaster Risk Reduction (DRR) | 101.9 | 67.6 | 34.3 | Infrastructure, equipment, capacity building |
| Ecosystems and Biodiversity | 110.7 | 87.0 | 23.7 | Conservation and protection of biodiversity and forests, research, capacity building |
| Monitoring and Reporting System | 0.08 | 0.05 | 0.03 | Coordination |
| **Total** | **346.78** | **245.75** | **101.03** | Across all sectors |

All of the above-mentioned needs and the expected support have been systematized in tabular form in accordance with the requirements of the United Nations Framework Convention on Climate Change (UNFCCC). The form includes the names of measures, a brief description, the estimated amount (disaggregated by currency and by sources—domestic and requested external), the expected implementation period, the required financial instrument, the type of support (mitigation, adaptation, or cross-cutting), the sector and subsector, the link to technology development and/or capacity building, alignment with national strategies, as well as the projected results and impacts.

## 4.4 Information on Received Financial Support

During the period 2017–2024, the Kyrgyz Republic mobilized a substantial volume of international climate support for the implementation of measures on climate change adaptation and greenhouse gas

(GHG) emission reduction. The total volume of funds received amounted to USD 1,312.7 million. The dynamics of inflows reflect a steady increase, reaching its peak in 2023. The funds were provided through multilateral financial institutions (the World Bank (WB), the Asian Development Bank (ADB), the European Bank for Reconstruction and Development (EBRD)), targeted climate funds (the Green Climate Fund (GCF), the Global Environment Facility (GEF), the Adaptation Fund, among others), as well as bilateral assistance programmes from individual countries (European Union, Germany, Switzerland, Japan, the Republic of Korea, etc.). The main forms of support included grants and concessional loans. The resources were directed to priority sectors, including energy, water resources, agriculture, infrastructure, and disaster risk reduction. Support was allocated relatively evenly across mitigation, adaptation, and cross-cutting (integrated) projects.

The dynamics of climate finance inflows for the period 2017–2024 (see Figure 4.1) demonstrate that the total volume of mobilized funds increased significantly over this period. At the beginning of the period, the annual volume of assistance amounted to approximately USD 125.1 million, while in 2022–2023 it reached its peak (around USD 278.3 million in 2023). Despite minor fluctuations in certain years (for example, decreases in 2018 and 2020), the overall trend is upward. This indicates a consistent increase in international support for climate action in the country. The growth was driven by all channels—multilateral development banks, targeted climate funds, and bilateral assistance from donor countries. Thus, by the end of the period, the volume of external climate finance had increased significantly, reflecting both the enhanced engagement of development partners and the expanded access of the Kyrgyz Republic to climate-related resources.

The dynamics of climate finance for the period 2017–2024, in thousand USD, are presented in Figure 4.1.[269]

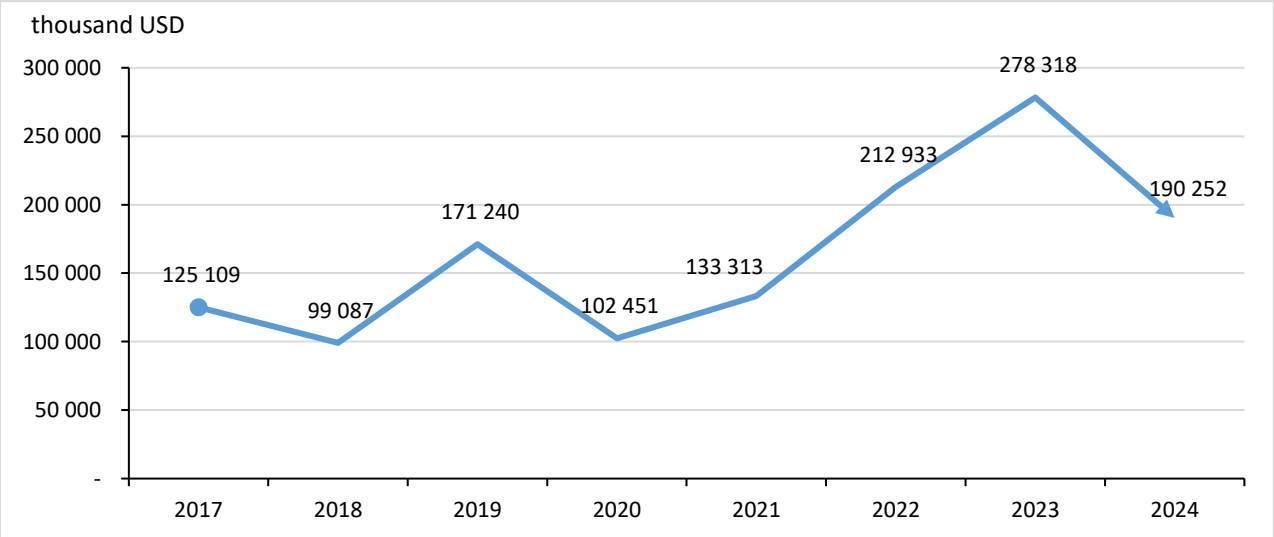



*Figure 4.1. Dynamics of International Support for the Kyrgyz Republic, 2017–2024*

During the period 2017–2024, the sectoral distribution of mobilized financial resources (see Figure 4.2) demonstrates that climate finance covered a wide range of sectors, with the largest share directed to the energy sector—approximately 31% of the total volume. This reflects substantial investments in renewable energy, energy efficiency, and related infrastructure projects.

A significant portion of climate assistance was also allocated to the water supply and sanitation sector (11%) and to agriculture, forestry, and fisheries (approximately 12%). These sectors are closely linked to climate change adaptation (water resources management, sustainable land use) and are critical for

[269] Compiled on the basis of OECD data for the period 2017–2023 and IATI data for 2024.

the country's resilience. Important, though smaller, shares of funding were directed to the transport and storage sector as well as disaster risk reduction (DRR), each accounting for around 5–7%. A portion of financing was also allocated to environmental protection (~6%) and to the development of the banking/financial sector (credit lines for "green" projects).

More modest percentages were distributed among social infrastructure, health, education, public administration support, and other services, which together accounted for less than 5–10%. Overall, the sectoral structure demonstrates that international assistance has been extended across many areas of the economy, while focusing on those most vulnerable to climate change—energy, water, and agriculture—as well as on infrastructure. Donor projects encompassed energy efficiency, reforestation, water supply, disaster early warning systems, and other areas, reflecting a comprehensive approach to strengthening the climate resilience of the Kyrgyz Republic.

The distribution of funds by sector for the period 2017-2024[270] is shown in Figure 4.

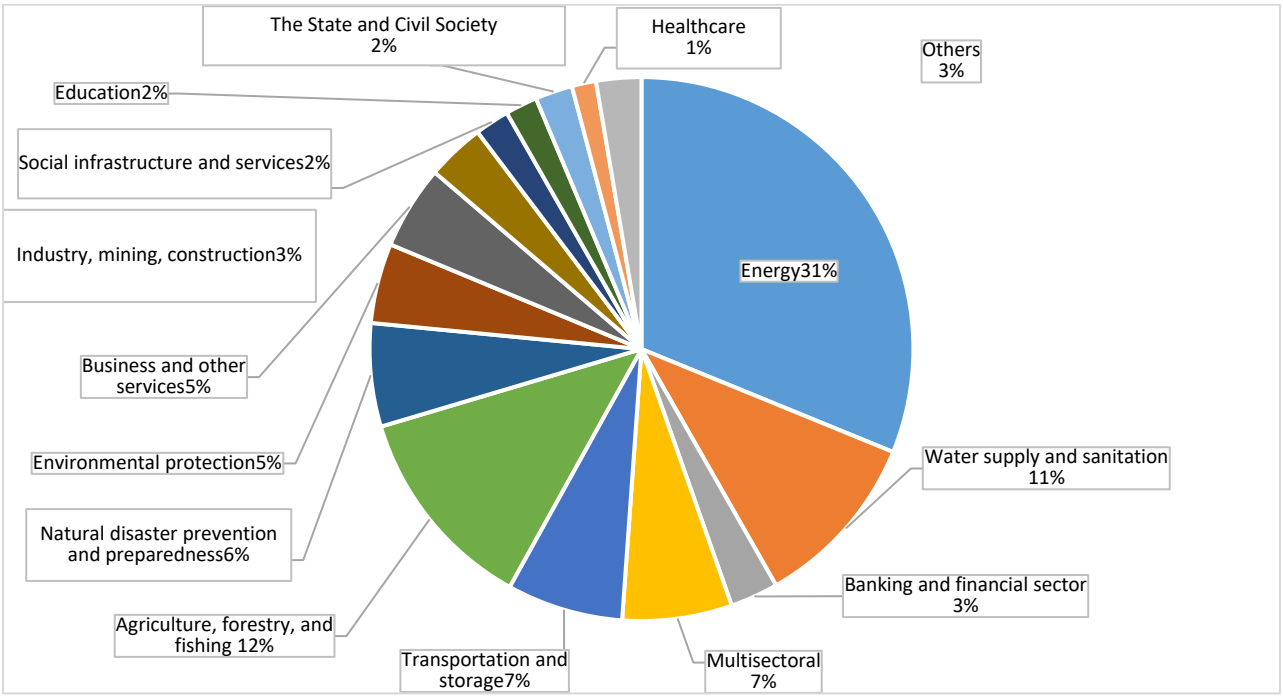



*Figure 4.2. Sectoral Distribution of Climate Finance in the Kyrgyz Republic, 2017–2024*

During the period 2017–2024, the predominant share of climate finance mobilized in the Kyrgyz Republic was provided in the form of grants and concessional loans, while the share of commercial borrowing remained very small (see Figure 4.3). Specifically, concessional loans from international financial institutions accounted for 47% of total climate finance—primarily from the World Bank (WB) and the Asian Development Bank (ADB), which provide loans on terms below market rates. Grants represented 42% of the total, reflecting the significant contributions of targeted climate funds (such as the Green Climate Fund (GCF) and the Global Environment Facility (GEF)), the grant component embedded in loans from international financial institutions, as well as bilateral donors providing resources on a non-repayable basis. Thus, approximately 89% of all resources consisted of grants or concessional lending, i.e., financing on favorable terms for the country. Non-concessional (commercial) loans accounted for only 11%, indicating limited involvement of market-based borrowing in climate project financing.

[270] Compiled on the basis of OECD data for the period 2017–2023 and IATI data for 2024.

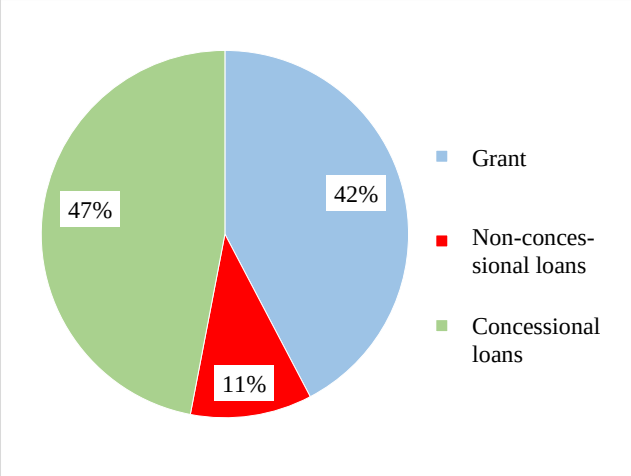
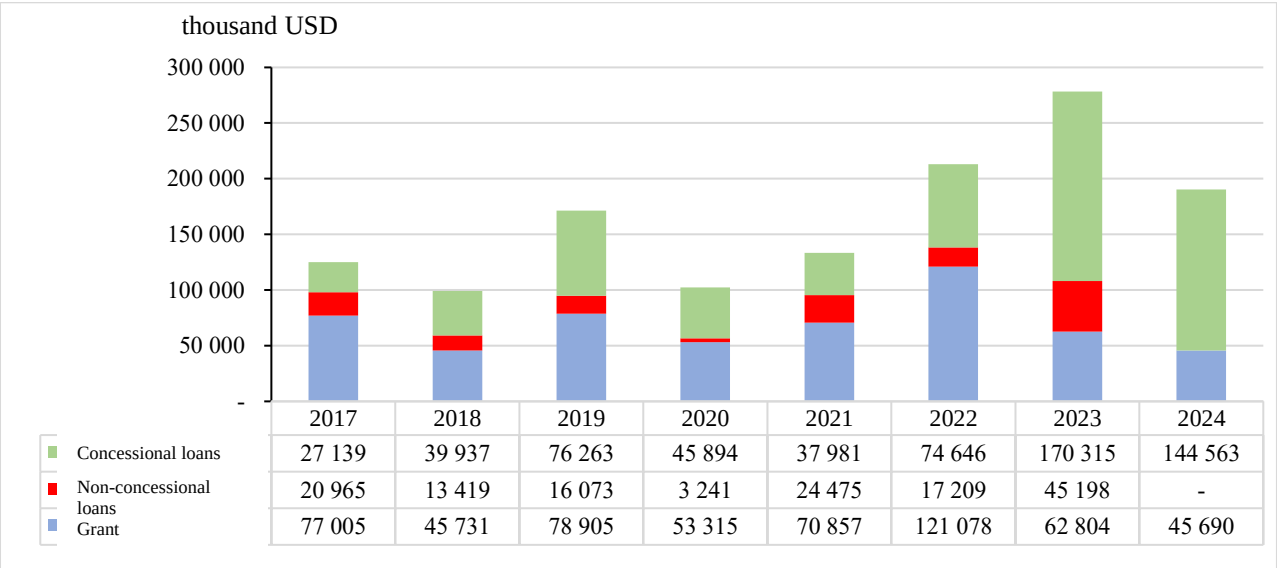



*Figure 4.3. Structure of Climate Finance by Financial Instruments (%)*[271]

At the same time, the absolute volumes of both grant resources and concessional loans increased steadily during the period 2017–2024, thereby driving the overall growth of climate finance (see Figure 4.4). In the early years of the reporting period (2017–2018), the volumes of support were relatively modest; however, after 2019 a noticeable upward trend was observed. The years 2022–2023 recorded the highest inflows, linked to the mobilization of large concessional loans from multilateral development banks for infrastructure projects, accompanied by a substantial increase in grant financing. By contrast, the share of non-concessional loans remained marginal throughout the years, indicating minimal reliance on commercial borrowing. Thus, the dynamics demonstrate that the growth of climate support was achieved primarily through the expansion of concessional loans and associated grant components, which enabled increased investment in climate projects without adding the burden of costly borrowing, as well as through grant financing provided by targeted climate funds and development partners.




| | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|---|---|---|
| Concessional loans | 27 139 | 39 937 | 76 263 | 45 894 | 37 981 | 74 646 | 170 315 | 144 563 |
| Non-concessional loans | 20 965 | 13 419 | 16 073 | 3 241 | 24 475 | 17 209 | 45 198 | - |
| Grant | 77 005 | 45 731 | 78 905 | 53 315 | 70 857 | 121 078 | 62 804 | 45 690 |

*Figure 4.4. Dynamics of Climate Finance by Financial Instruments*[272]

[271] Compiled on the basis of OECD data for the period 2017–2023 and IATI data for 2024.
[272] Compiled on the basis of OECD data for the period 2017–2023 and IATI data for 2024.

When examining the sources of international support by financing channels (see Figure 4.5), it is evident that multilateral sources dominate: approximately 85% of all inflows were provided through multilateral development banks, funds, and programmes, while bilateral assistance from individual countries accounted for about 15%. In other words, the Kyrgyz Republic receives the bulk of its climate-related resources through international financial institutions and global climate funds.

Among the multilateral financing channels, the International Development Association of the World Bank Group and the Asian Development Bank stand out, providing concessional loans and grants, as well as European Union programmes, which provide grant financing. Bilateral support from individual countries, although significant, is considerably smaller in volume. Its scale is estimated at only tens of millions of US dollars per year. Thus, the predominance of multilateral channels underscores the Kyrgyz Republic's strong dependence on international financial institutions and funds in implementing its climate agenda, while bilateral donors complement this support by focusing on specific priorities.

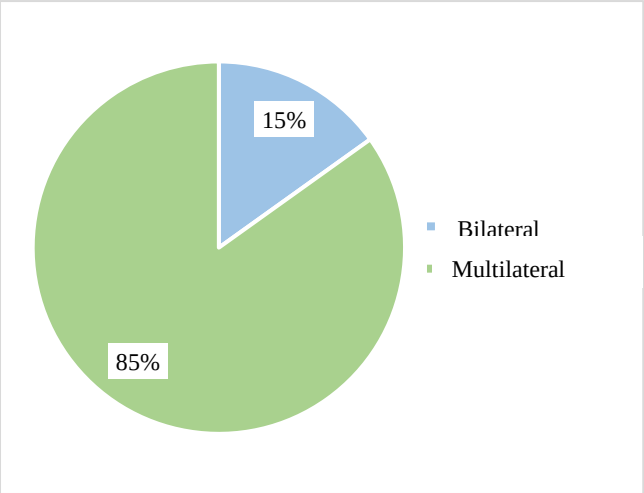



*Figure 4.5. Structure of Climate Finance by Channels, %* [273]

The dynamics of climate finance inflows by financing channels (see Figure 4.6) reflect growth primarily driven by the expansion of multilateral support. After 2017, both types of financing showed an upward trend; however, the pace differed. Inflows from multilateral partners increased significantly after 2019, reaching their peaks in 2022–2023, when large-scale projects were implemented through international banks and funds. Bilateral assistance also grew somewhat, but remained relatively stable and modest in volume, amounting to only several tens of millions of US dollars annually.

During the peak years of inflows (2022–2023), the share of bilateral resources decreased markedly against the backdrop of the sharp increase in multilateral financing. Thus, the channel-based dynamics demonstrate that the key driver of scaling up climate investments was multilateral initiatives—large loans and grants from international financial institutions and grants from global climate funds. At the same time, bilateral support ensured a stable but limited contribution. This highlights the leading role of multilateral partners in expanding climate assistance to the Kyrgyz Republic.

[273] Compiled on the basis of OECD data for the period 2017–2023 and IATI data for 2024.

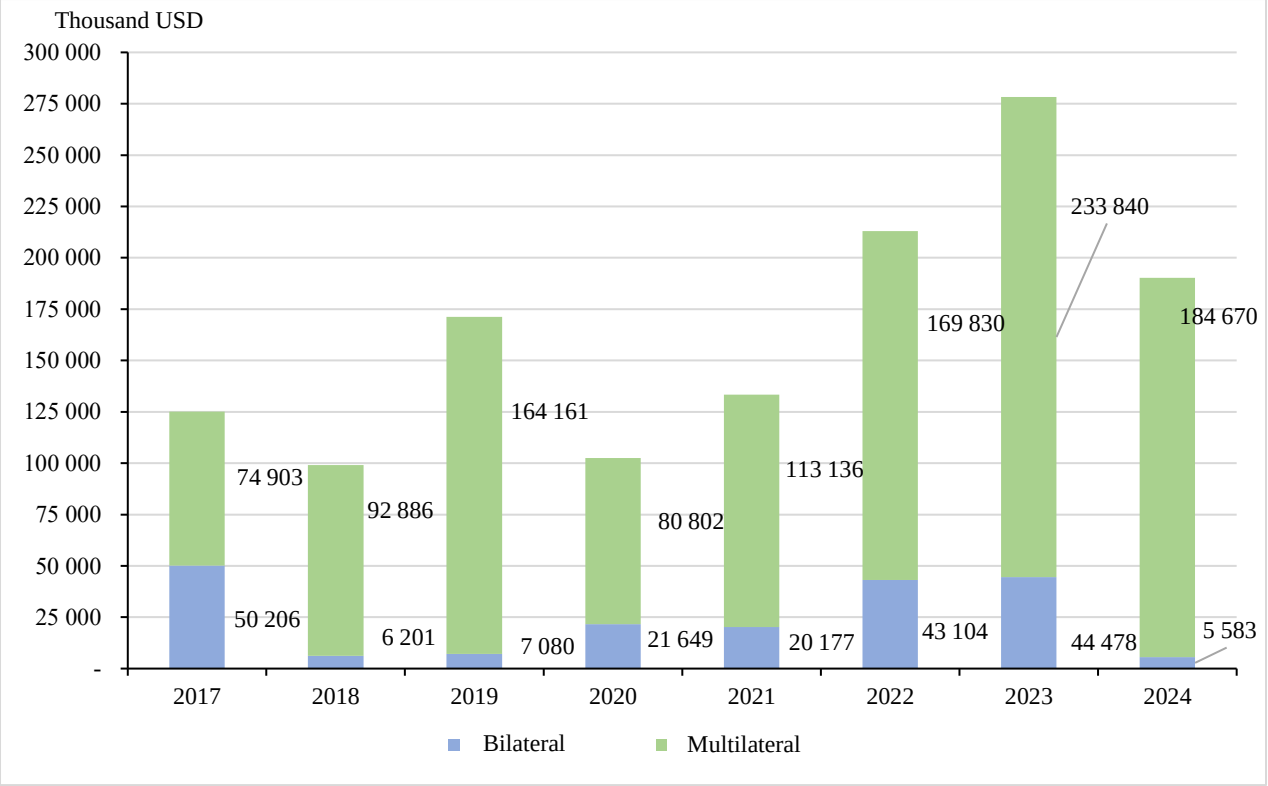
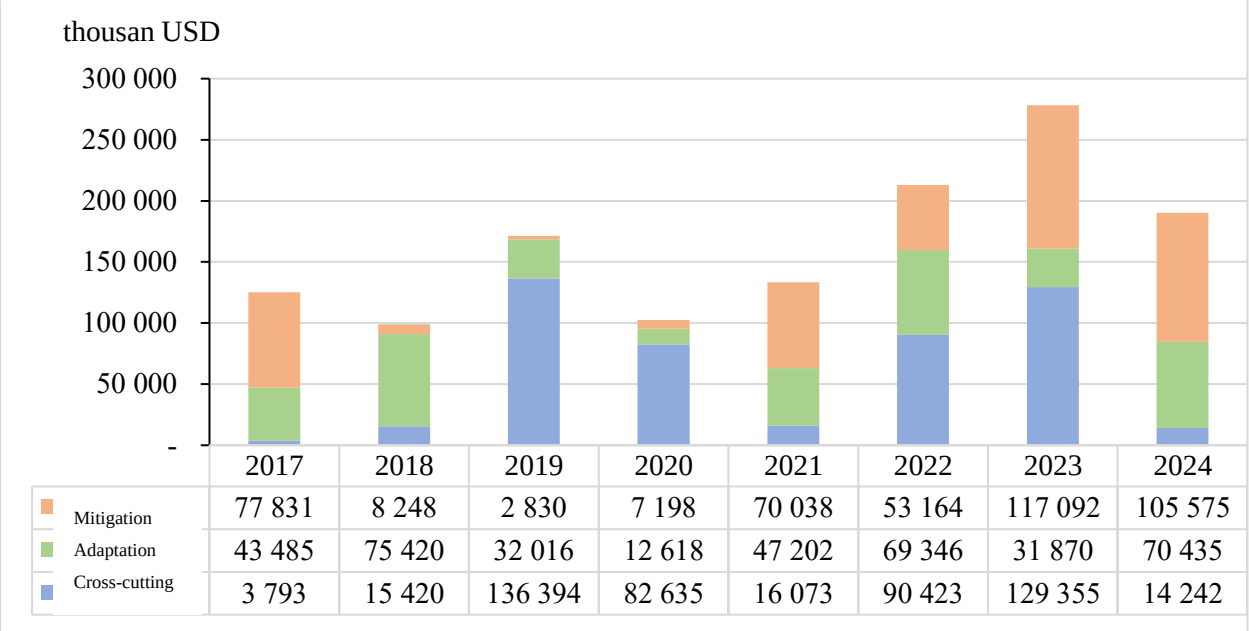



*Figure 4.6. Dynamics of Climate Finance by Channels (Multilateral and Bilateral), 2017–2024* [274]

When analyzing financing by type of support—climate change mitigation, climate change adaptation, and cross-cutting (integrated) projects combining both objectives (see Figure 4.7)—the following trends can be observed. Both mitigation and adaptation financing demonstrated growth, although their shares fluctuated from year to year. In certain periods, mitigation financing prevailed (for example, through projects in renewable energy, energy efficiency, or the forestry sector, which yield emission reduction benefits), while in other years adaptation financing increased (particularly with the launch of projects in water supply, agriculture, disaster risk reduction, and other resilience-related measures).

Cross-cutting projects (targeting both mitigation and adaptation simultaneously) also received notable financing annually, with volumes gradually increasing as integrated initiatives (such as climate-resilient agriculture and ecosystem management) became part of the project portfolio. Overall, the data demonstrate a balanced pattern of support: the country consistently mobilized resources for both mitigation and adaptation each year. During the reporting period (2017–2024), a wide range of projects on both mitigation and adaptation were implemented with external support, in line with the priorities of the Nationally Determined Contribution and the climate agenda of the Kyrgyz Republic.

[274] Compiled on the basis of OECD data for the period 2017–2023 and IATI data for 2024.




| | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|---|---|---|
| Mitigation | 77 831 | 8 248 | 2 830 | 7 198 | 70 038 | 53 164 | 117 092 | 105 575 |
| Adaptation | 43 485 | 75 420 | 32 016 | 12 618 | 47 202 | 69 346 | 31 870 | 70 435 |
| Cross-cutting | 3 793 | 15 420 | 136 394 | 82 635 | 16 073 | 90 423 | 129 355 | 14 242 |

*Figure 4.7. Dynamics of Climate Finance by Type of Support (Mitigation, Adaptation, Cross-Cutting Projects), 2017–2024*[275]

Overall, during the reporting period, the distribution of funds by type of support was relatively balanced. Specifically, 29% of mobilized resources were directed towards adaptation, 34% towards mitigation, and 37% towards cross-cutting (integrated) projects that deliver benefits for both adaptation and emission reductions. This indicates that international climate support has been comprehensive, without a clear dominance of a single type of support. The high share of financing for cross-cutting projects reflects the prioritization of initiatives with dual benefits, such as sustainable land management and climate-oriented agricultural development.

At the same time, the majority of mitigation-related resources were allocated to the energy sector, energy efficiency improvements, and the forestry sector. Financing of adaptation measures reflected the prioritization of enhancing the Kyrgyz Republic's resilience to climate change, as significant resources were allocated to projects in water, agriculture, disaster risk reduction, and protection of vulnerable groups.

Thus, the country has been implementing and financing measures aimed at reducing greenhouse gas (GHG) emissions alongside adaptation measures. Such a balance corresponds to the needs of the country and demonstrates that the support received addresses all key aspects of climate change response.

The structure of climate finance by type of climate action is shown in Figure 4.8.

[275] Compiled on the basis of OECD data for the period 2017–2023 and IATI data for 2024.

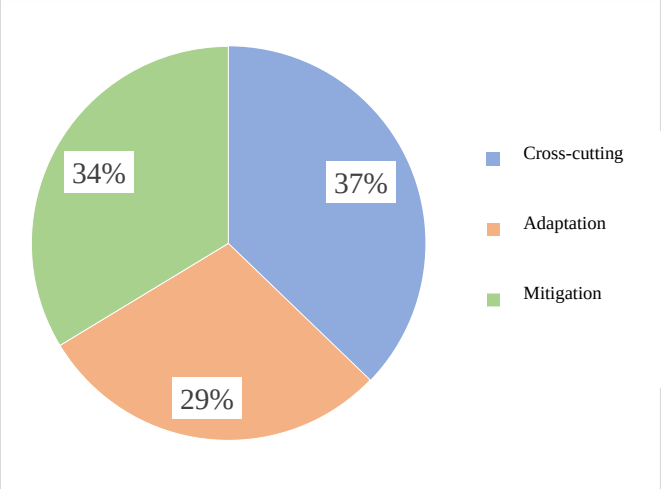



*Figure 4.8. Structure of Climate Finance by Type of Support, 2017–2024.* [276]

## 4.5 Information on technology development and transfer support needed under Article 10 of the Paris Agreement

To implement the climate commitments and priorities outlined in the Nationally Determined Contribution and the National Adaptation Plan (NAP), the Kyrgyz Republic conducted a comprehensive Technology Needs Assessment with technical support from the UNEP Copenhagen Climate Centre (UNEP-CCC) and funding from the Green Climate Fund. [277] This work made it possible to identify the key technological areas required to achieve mitigation and adaptation goals in the priority sectors—energy, agriculture, water resources, and waste management.

In the energy sector, the main needs include technologies for transitioning to cleaner fuels and improving energy efficiency. Among the priority solutions are the replacement of coal-fired boilers with gas-fired systems, the introduction of energy-efficient stoves, and building insulation. These technologies are associated with a high potential for reducing greenhouse gas emissions and delivering significant social benefits, but at the same time require the development of a regulatory framework, market incentives, and state support mechanisms. In addition, there is a need for technologies to advance renewable energy, particularly modern energy storage systems and smart grids. Digital solutions also play an important role—in particular, technologies for smart grid management and energy loss control.

In the agriculture sector, the focus is placed on sustainable farming and efficient use of water resources. The identified priorities include sustainable pasture management, organic farming, drip and subsurface irrigation, agroforestry, and the introduction of drought-resistant crop varieties. These technologies support the adaptation of rural areas to changing climate conditions, but require not only equipment supply, but also capacity building, support from research institutions, and the development of agro-ecological services.

In the water resources sector, technology needs are focused on ensuring sustainable water supply in the context of shrinking glaciers and increasing water scarcity. Priority is given to energy-efficient pumping stations, closed irrigation systems, and water treatment facilities adapted to mountainous conditions. The introduction of these solutions requires the establishment of demonstration facilities, the standardization of approaches, and the training of specialists at the local level.

[276] Compiled on the basis of OECD data for the period 2017–2023 and IATI data for 2024.
[277] Technology Needs Assessment in the Kyrgyz Republic. https://unepccc.org/project/technology-needs-assessment-in-the-kyrgyz-republic/

The waste management sector requires modernization through technologies for mechanical and biological treatment of municipal solid waste (MSW) and the use of organic residues for biogas production. As these technologies are considered public goods, their dissemination is possible mainly with support from the state and international partners. Key Objectives include the introduction of tariff regulation, the development of separate collection infrastructure, and the stimulation of local investment in recycling.

The analysis also revealed cross-cutting barriers to large-scale technology deployment—including the absence of investment incentives, a shortage of skilled professionals, low awareness among beneficiaries, and weak coordination among stakeholders. Within the framework of the Technology Action Plans (TAPs), recommendations were developed to overcome these barriers, including the implementation of training programmes, the development of a regulatory framework, the creation of preferential financing conditions, and the expansion of access to international technical assistance.

Thus, the Kyrgyz Republic has identified priority areas for technological support to achieve its climate objectives and anticipates further cooperation for the implementation of these solutions under Article 10 of the Paris Agreement.

## 4.6 Information on technology development and transfer support received undervArticle 10 of the Paris Agreement

During the period 2017–2024, the Kyrgyz Republic received substantial international support aimed at the development and transfer of climate-resilient technologies. This assistance contributed to the introduction of innovative solutions in the fields of energy, agriculture, water resources management, and early warning systems for climate-related hazards. Below are key projects and initiatives in technology development and transfer implemented with the support of development partners:

- **Technology Needs Assessment (TNA):** During 2020–2023, with the support of the Climate Technology Centre and Network (CTCN), a comprehensive analysis of the Kyrgyz Republic's technology needs was conducted.[278] The project was financed through the Green Climate Fund Readiness Programme and implemented by the United Nations Environment Programme through the Copenhagen Climate Centre. The TNA identified priority climate technologies in four sectors—agriculture, energy, water resources, and waste management—in line with the Nationally Determined Contribution (NDC, 2021). The outputs included Technology Action Plans (TAPs) and project concepts for the introduction of modern low-carbon and adaptation technologies.
- **Artificial Glaciers for Water Supply and Adaptation:** In order to address glacier melt and water shortages in high-altitude pastures, the technology of artificial glaciers was successfully applied. The International Fund for Agricultural Development financed the project *"Access to Markets"* (2016–2024, budget USD 31.2 million), under which the construction of 11 artificial glaciers was supported. [279] The project provided materials and funding, as well as training for local communities. In total, approximately 30 micro-glaciers were established across six regions[280], increasing freshwater availability during summer months and improving pasture productivity. These simple technological structures accumulate winter water in the form of ice and release it in summer, thereby enhancing the climate resilience of the agricultural sector.

[278] https://unepccc.org/project/technology-needs-assessment-in-the-kyrgyz-republic/
[279] Sept.10,2024 https://kyrgyzstan.un.org/ru/node/278274
[280] Ibid.

- **AI-Based Early Warning System:** (Further – AI). To prevent climate-related disasters, the Kyrgyz Republic introduced innovative technologies for monitoring mountain lakes and issuing flood warnings. With the support of the Government of Japan and the United Nations Development Programme, the national Emergency Monitoring System was upgraded with an artificial intelligence module for analyzing satellite imagery and meteorological data. [281] In 2024, automatic hydrometeorological stations were installed on mountain rivers, enhancing early warning capabilities for mudflows and glacial lake outbursts. [282] The new system automatically detects dangerous increases in lake water volume and issues alerts via the "112 Kyrgyzstan" mobile application, SMS, and media outlets. In July 2024, the system enabled early detection of a potential outburst at Lake Zyndan and the evacuation of residents from the village of Tura-Suu, preventing casualties. The project demonstrated the effectiveness of investing in innovative adaptation technologies: two automatic meteorological stations and the national AI platform formed the basis of the new monitoring system; 1,663 meters of channels were reinforced for mudflow diversion; and local response groups were trained and equipped.[283]
- **EBRD Sustainable Energy Financing Facilities (KyrSEFF I, II, III):** Implemented from 2013 to the present, financed by the European Bank for Reconstruction and Development. Under KyrSEFF I and II, USD 55 million was allocated, and in December 2022 the new KyrSEFF III programme (USD 50 million) was launched with grant incentives and technical assistance. The goal is to promote energy-efficient solutions among households and small enterprises. The programme facilitated the transfer of technologies such as thermal insulation materials, energy-efficient boilers, solar water heaters, and LED lighting. Technologies were disseminated through concessional credit mechanisms combined with technical assistance. Through KyrSEFF, the EBRD supports sustainable financing and the implementation of energy efficiency and renewable energy projects in the private sector. Joint efforts across private, public, and residential sectors contribute to changing energy consumption models and reducing environmental impacts. Estimated annual GHG emission reductions from KyrSEFF investments amount to 68,000 tonnes.[284.] Success stories are available at: https://ebrdgeff.com/kyrgyzstan/projects/.
- **Projects on Transition to Renewable Energy Sources:** Several initiatives are being implemented jointly with multilateral development banks, such as the regional E-Mobility programme and the Sustainable Renewables Market Initiative. [285] These projects are aimed at the transfer of advanced technologies (solar panels, energy-efficient stoves, electric vehicles, etc.) and at reducing GHG emissions, thereby creating a foundation for low-carbon development.

All of these examples demonstrate that international support has enabled the Kyrgyz Republic to access modern technologies for climate change mitigation and adaptation. The implemented projects contribute to the technological modernization of the economy—from improved water resources and agricultural management to the development of renewable energy and digital climate monitoring systems.

[281] Early Warning System in the Kyrgyz Republic: Real-Time Risk Monitoring, 27 июня 2025 года, https://www.undp.org/kyrgyzstan/stories/early-warning-system-kyrgyz-republic-real-time-risk-monitoring
[282] Там же
[283] Там же
[284] The EBRD in the Kyrgyz Republic: Results Snapshot, December 2022
[285] https://www.greenclimate.fund/project/fp225

## 4.7 Information on capacity-building support needed under Article 11 of the Paris Agreement

The Kyrgyz Republic has been taking consistent steps to fulfill its commitments under the Paris Agreement; however, for sustainable and systematic implementation of requirements related to transparency, climate planning, and reporting, targeted international support in the area of capacity-building is essential. Key capacity-building needs have been identified and grouped into the following areas:

**1. Human Capacity Development.** At the national level, there remains a shortage of qualified personnel with specialized knowledge in climate modeling, greenhouse gas inventory, monitoring progress on the Nationally Determined Contribution[286], development of climate scenarios, and preparation of national reports.[287] The existing workforce requires systematic training and long-term support. In this regard, the Kyrgyz Republic requires assistance in:

- organizing comprehensive trainings and internships on Intergovernmental Panel on Climate Change methodologies, Monitoring, Reporting and Verification systems, and accounting and forecasting of emissions across different sectors of the economy (particularly in agriculture, energy, and waste);[288]
- preparing national trainers and experts capable of further training specialists at the local level;
- establishing a sustainable knowledge transfer system, including the development of training modules and the integration of climate topics into formal education (universities, training centers under government agencies);
- strengthening monitoring and mobilization of climate finance.

**2. Institutional Development and Coordination.** Despite the presence of certain structures responsible for climate policy, the institutional architecture requires strengthening. Support is needed to:

- develop and implement institutional regulations ensuring regular collection, verification, exchange, and transfer of climate data;
- strengthen coordination among ministries and agencies, including the establishment of inter-agency working groups on climate and transparency;
- develop strategies for mobilizing investments for climate projects and preparing well-substantiated proposals to international funds (e.g., the Green Climate Fund, Adaptation Fund);
- create information systems for the collection, processing, and storage of climate-related information and data.

**3. Technical and Digital Support.** The Kyrgyz Republic currently lacks a fully functioning digital platform for climate action tracking, data collection, and analysis, with many processes still carried out manually or in Excel. Therefore, the country requires capacity-building support in:

- developing an automated national climate information system covering modules on GHG inventory, NDC, transparency, and project monitoring;
- introducing Geographic Information Systems and Remote Sensing solutions, especially for monitoring in the forestry sector, agriculture, and adaptation;
- accessing modern climate modeling tools and software for GHG emission projections and mitigation scenario analysis;

[286] Rapid Transparency Assessment for Central Asia and the Caucasus | CBIT-GSP
[287] Technical analysis of the first biennial update report of Kyrgyzstan, 2024. https://unfccc.int/documents/638772
[288] First Biennial Update Report of the Kyrgyz Republic under the United Nations Framework Convention on Climate Change, 2021

- developing national systems for Measurement, Reporting and Verification of GHG emissions, mitigation actions and support, as well as Monitoring and Evaluation of adaptation actions.

**4. Local-Level Action and Stakeholder Engagement.** The local level remains one of the weakest links: regional authorities and ayil aimaks (rural municipalities) have limited knowledge of climate risks and the integration of climate measures into development planning. Support is required for:

- raising awareness and training local authorities, especially in climate-vulnerable areas;
- engaging non-governmental organizations, youth, and vulnerable groups, including the development of awareness-raising materials in Kyrgyz and Russian;
- introducing pilot adaptation practices and renewable energy technologies at the local level, with subsequent scaling-up.[289]

In conclusion, to achieve sustainable progress in the implementation of the Paris Agreement, the Kyrgyz Republic requires comprehensive support in capacity-building, primarily aimed at the systematic development of competencies, the establishment of robust institutions, and the digitalization of climate governance.

## 4.8 Information on capacity-building support received under Article 11 of the Paris Agreement

During the period 2017–2024, the Kyrgyz Republic received substantial international support for capacity-building from various development partners. This support covered a wide range of areas—from training specialists in greenhouse gas inventory and climate adaptation to strengthening institutional structures for climate governance. Below are examples of projects and programmes through which the Kyrgyz Republic has enhanced its capacity to address climate change:

- **Grant Support Project "Safe Learning in School,"** implemented by UNICEF with support from the Government of Japan during 2017–2020. The project aimed to ensure the safety of children and schools in the face of natural disasters and climate change impacts, drawing on Japan's experience. Ten model schools oriented toward disaster risk reduction were assessed, and in schools previously lacking adequate equipment, alarm systems, emergency exit signs, and fireproof metal doors were installed. Educational materials were developed, and training was conducted for 65,000 students and 3,000 teachers in 121 schools. Local government officials also participated in evacuation drills and disaster risk reduction (DRR) training to help communities take life-saving measures during disasters.[290]This project enhanced local preparedness for floods, landslides, and other climate hazards, thereby strengthening adaptation capacity at the civil society level.
- **Institutional Capacity-Building for Engagement with the Green Climate Fund (GCF Readiness Project, implemented by FAO).[291]** With GCF support, in 2018–2019 the Kyrgyz Republic implemented a project to prepare national institutions for effective engagement with the Fund. The project was aimed at strengthening institutional capacity to manage GCF-related

[289] UNDP – GCF Publication, 2024. "Assessment of Institutional Capacity for National Adaptation Planning to Climate Change in Four Priority Sectors of the Kyrgyz Republic." https://www.undp.org/ru/kyrgyzstan/publications/ocenka-institucionalnogo-potenciala-po-nacionalnomu-planirovaniyu-adaptacii-k-izmeneniyu-klimata-v-chetyrekh-prioritetnykh
[290] Project for Supporting Safe School Programme Grant Aid (Partnership with UNICEF) (March 2017 – March 2020), https://www.mofa.go.jp/policy/oda/white/2020/html/honbun/b2/s3_3.html
[291] https://www.greenclimate.fund/document/nda-strengthening-and-country-programming-support-kyrgyzstan-through-fao

processes, including: (a) institutional mechanisms required at various levels; and (b) a clear and comprehensive strategic framework for engagement, incorporating a portfolio of potential projects/programmes aligned with national priorities and GCF investment criteria. The project budget amounted to USD 300,000 (GCF Readiness grant).[292] As a result, procedures for the selection and preparation of project proposals were developed, and priority areas for GCF financing were identified. This support enhanced the country's capacity to attract international climate finance and to develop high-quality project proposals.

- **Capacity-Building Programmes from the United Nations and Other Partners.** In addition to targeted projects, the Kyrgyz Republic has systematically benefited from international initiatives supporting capacity-building. The United Nations Development Programme and the United Nations Environment Programme, through technical assistance projects, trained national experts in GHG inventory preparation and the development of Monitoring, Reporting and Verification systems, climate risk assessments, and the formulation of National Adaptation Plans. GIZ and FAO provided training on forestry management and agriculture, including modern methods of reforestation, agroforestry, sustainable pasture management, and climate-resilient agriculture. The International Fund for Agricultural Development, through rural development projects (such as the *Access to Markets* project), trained farmers in climate-resilient agricultural practices such as rational irrigation, the use of drought-resistant crop varieties, and the construction of small artificial glaciers for freshwater storage and improved pasture microclimates. The training and seminars covered a wide range of topics, including water resources management, energy efficiency, agricultural adaptation, and the establishment of climate monitoring systems.

The capacity-building support received by the Kyrgyz Republic has significantly strengthened national capabilities for implementing climate policy. Thanks to these initiatives, human resource capacity has improved: specialists were trained in GHG inventory, climate modeling, and climate finance project development. However, limitations remain in terms of expertise within government and municipal institutions, and mechanisms for sustainable knowledge transfer are still insufficiently developed.

## 4.9 Information on support needed and received related to transparency activities, including for transparency-related capacity-building

As a developing country, the Kyrgyz Republic is actively working on establishing a sustainable national transparency system in accordance with Article 13 of the Paris Agreement. To meet the requirements of the Enhanced Transparency Framework, the country both receives international support and formulates key needs in the areas of Monitoring, Reporting and Verification, capacity development, and institutional strengthening. It should be noted that the Kyrgyz Republic also requires support for capacity-building related to the Monitoring and Evaluation of adaptation actions, both at the institutional and human resource levels.

**Key transparency-related needs include:**

1. **Establishment and institutionalization of the MRV system** for systematic data collection on emissions and measures undertaken. The Kyrgyz Republic requires support in developing the regulatory framework, institutional mechanisms, and inter-agency data exchange processes. Legislative initiatives are needed to anchor MRV systems across all sectors of the economy for regular inventory preparation and reporting.

[292] https://www.fao.org/gcf/projects-map/project-detail/supporting-the-kyrgyz-republic-to-strengthen-its-capacities-and-develop-a-strategic-framework-for-gcf/en

2. **Human capacity development.** The country faces a shortage of specialists with knowledge of Intergovernmental Panel on Climate Change methodologies, ETF online transparency tools, preparation of Biennial Transparency Reports emission projections, integration of adaptation measures into planning, and reporting mechanisms, including financial reporting. A long-term training and mentorship programme is required.
3. **Financing of reporting.** The preparation of documents under the ETF requires significant resources, including remuneration of experts, data collection, and independent technical review.

**Support received includes:**

- Project "Supporting the Kyrgyz Republic in Preparing and Submitting its Biennial Transparency Reports (BTR-1/BTR-2) and the Fifth National Communication," implemented jointly by the United Nations Environment Programme and the United Nations Development Programme (UNDP) with funding from the Global Environment Facility.
- UNDP–GCF project "Advancing the Process of Developing a National Adaptation Plan for Medium- and Long-Term Planning and Implementation of Adaptation Measures in the Kyrgyz Republic," implemented during 2021–2024.

With the support provided, the Kyrgyz Republic successfully submitted its Biennial Update Report (BUR-1), the Fourth National Communication (NC-4), prepared its first Biennial Transparency Report (BTR-1), and developed Adaptation Plans for priority sectors. In this regard, continued support for strengthening transparency—particularly in the areas of regulatory reform, human capacity-building, and financing—remains critically important to ensure full implementation of obligations under Article 13 of the Paris Agreement.

A detailed list of projects providing transparency-related support is attached to this report.

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# Annex 1. Projects Supporting Climate Activities in the Kyrgyz Republic

| Project Title | Project Description | Implementing Agency | Received Amount | | Period | Financial tool | Sector | Outputs and Results | Additional Information |
|---|---|---|---|---|---|---|---|---|---|
| | | | *thousand KGS* | *thousand USD* | | | | | |
| Renewable Energy Development in the Kyrgyz Republic | Reconstruction of hydropower plants and construction of new hydropower plants at selected sites, modernization and strengthening of selected grid infrastructure to support the development of large-scale renewable energy sources. | Ministry of Energy of the Kyrgyz Republic | 5,920,365.00 | 67,700.00 | 2024 – 2028 | Concessional Loan | Energy | The expected results of the first stage include an increase in the generating capacity of hydropower plants by more than 20 MW, an increase in deployed variable renewable energy by at least 100 MW, and a reduction of greenhouse gas (GHG) emissions by 50.3 tons of $CO_2$ equivalent over the entire project implementation period. | World Bank project, based on project components, https://www.worldbank.org/en/news/press-release/2023/06/28/the-kyrgyz-republic-to-boost-its-renewable-energy-potential-with-support-from-the-world-bank-and-the-green-climate-fund |
| Modernization of the Uch-Kurgan Hydropower Plant | The project involves replacing outdated electrical and mechanical equipment for electricity generation and transmission at the Uch-Kurgan HPP of the Naryn Cascade, as well as carrying out works to remove silt and deposits that hinder the normal | Ministry of Energy of the Kyrgyz Republic | 5,906,862.02 | 67,545.59 | 2019 – 2027 | Concessional Loan | Energy | The project aims to enhance renewable energy supply and energy security by improving the reliability of power generation. The expected result is the full restoration of all four | ADB project, based on project components https://www.adb.org/projects/49240-002/main |

| Project Title | Project Description | Implementing Agency | Received Amount | | Period | Financial tool | Sector | Outputs and Results | Additional Information |
|---|---|---|---|---|---|---|---|---|---|
| | | | *thousand KGS* | *thousand USD* | | | | | |
| | operation of the hydromechanical equipment. This will (i) increase the availability of clean hydropower for domestic consumption and potential export to Uzbekistan and Kazakhstan, (ii) improve the reliability of hydromechanical facilities and ensure the safe and optimal operation of reservoirs, and (iii) contribute to long-term water management from the Naryn Cascade, which is of critical importance for agriculture downstream, primarily in Uzbekistan. | | 3 594 195,00 | 41 100,00 | 2019-2028 | Grant | Energy | hydropower units of the Uch-Kurgan HPP, with an increase in total capacity to 216 MW compared to the original 180 MW. | |
| Climate-Resilient Water Supply Project | Expand access to water supply services in selected river basins and (ii) strengthen institutional capacity for climate-resilient water resources management at local and national levels. | Ministry of Water Resources, Agriculture, and Processing Industry of the Kyrgyz Republic | 3,536,075.12 | 40,435.39 | 2022 – 2028 | Concessional Loan | Water Supply and Sanitation | Improved access to water supply and sanitation for 95,000 people; enhance energy efficiency and reduce water losses; modernize irrigation systems covering 28,000 hectares; reduce emissions related to water supply and land use. | World Bank project, based on project components, https://documents1.worldbank.org/curated/en/323301650378361478/pdf/Kyrgyz-Republic-Climate-Resilient-Water-Services-Project.pdf |
| | | | 2 953 007,23 | 33 767,95 | | Grant | | | |
| Avalanche Protection Project on the Bishkek–Osh Highway | The project aims to ensure year-round traffic capacity on the Bishkek–Osh highway during the winter season, improving safety and logistics through the construction of a snow protection gallery (snow-shed tunnel) at km 246 of the highway (Kochku-Bullak section, Toktogul district, Jalal-Abad region). | Ministry of Transport and Communications of the Kyrgyz Republic | 3,342,621.13 | 38,223.23 | 2022 – 2024 | Grant | Disaster Prevention and Preparedness | Construction of a 460 m snow-shed, a 550 m access road (190+360=550 m), with a total length of 1,010 m. | Japanese project |

| Project Title | Project Description | Implementing Agency | Received Amount | | Period | Financial tool | Sector | Outputs and Results | Additional Information |
|---|---|---|---|---|---|---|---|---|---|
| | | | *thousand KGS* | *thousand USD* | | | | | |
| Modernization and Sustainable Development of the Power Sector in the Kyrgyz Republic | Strengthening the financial and operational sustainability of the power sector through the reconstruction of distribution networks and the introduction of digital electricity metering systems. In addition, the project supports the reinforcement of the social protection system by implementing short- and medium-term measures to strengthen social protection systems and mitigate the impact of electricity tariff reforms on the recovery level of poor and vulnerable households. | Ministry of Energy of the Kyrgyz Republic | 2,761,563.31 | 31,578.77 | 2023 – 2027 | Grant | Energy | Reduce greenhouse gas emissions through the reconstruction and digitalization of electricity distribution networks, improve sector management through institutional reforms and the establishment of an energy planning unit, enhance financial transparency, improve service quality, and create a supporting social protection mechanism for vulnerable population groups. | Switzerland – IBRD https://www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SECO/en/2022/UR01382/phase1 World Bank project components https://projects.worldbank.org/en/projects-operations/project-detail/P177871 |
| | | | 1 877 596,36 | 21 470,51 | | Concessional Loan | Energy | | |
| Additional Financing for the Central Asia – South Asia Electricity Transmission and Trade Project (CASA-1000) | The objective of the project is to meet electricity demand in Afghanistan and Pakistan by establishing cross-border electricity exchange among the four participating countries within the framework of regional economic integration. This exchange will be carried out using efficient and environmentally sustainable local hydropower resources of the Kyrgyz Republic and Tajikistan. The project will create conditions for sustainable electricity trade between the countries of Central Asia (the Kyrgyz Republic and Tajikistan) and South Asia (Afghanistan and Pakistan). | JSC "Electric Power Plants" | 2,631,865.87 | 30,095.66 | 2023 – 2025 | Concessional Loan | Energy | As of May 2024, all 1,243 transmission towers had been completed and 320 km of conductors installed. With the additional financing, the remaining 136 km will be completed, enabling the full construction of the entire 500 kV transmission line with a total length of 456 km. | Islamic Development Bank (IsDB), based on project components. https://www.isdb.org/news/isdb-board-approves-financing-of-projects-worth-us-403-million-for-sustainable-development-and-economic-transformation https://documents1.worldbank.org/curated/en/099102924124555682/pdf/P145054-71bec88e-5c65-4ac7-aa2b-8eddd27f49b2.pdf |

| Project Title | Project Description | Implementing Agency | Received Amount | | Period | Financial tool | Sector | Outputs and Results | Additional Information |
|---|---|---|---|---|---|---|---|---|---|
| | | | *thousand KGS* | *thousand USD* | | | | | |
| Carbon Sequestration through Climate Investments in Forests and Pastures of the Kyrgyz Republic | Carbon sequestration through climate investments in forests and pastures in the Kyrgyz Republic. | FAO | 2,622,496.07 | 29,988.52 | 2019 – 2030 | Grant | Agriculture, Forestry, Fisheries | It is expected that over 20 years, 19.8 million $tCO_2e$ will be sequestered through the restoration of degraded forests and pastures. This will enhance climate resilience, reduce erosion and landslide risks, improve ecosystem services, and support green value chains and land management with gender-sensitive considerations. | GCF https://www.greenclimate.fund/project/fp116 |
| District Heating Improvement Project | Improving the efficiency and quality of the centralized district heating system in Bishkek; testing efficient and environmentally friendly heating stoves; and demonstrating the benefits of enhanced energy efficiency in public buildings. | Community Development and Investment Agency (ARIS) | 2,181,097.27 | 24,941.08 | 2019 – 2025 | Concessional Loan | Energy | The project aims to improve the efficiency and reliability of Bishkek's centralized district heating system, reduce energy losses and fuel consumption, and provide more than 165,000 people with improved heating during the winter season. In addition, energy efficiency retrofits have been completed in 21 public buildings, demonstrating best practices in energy-efficient modernization. | World Bank Project, based on project components: https://projects.worldbank.org/en/projects-operations/project-detail/P157079?lang=en https://www.worldbank.org/en/news/press-release/2023/07/06/the-kyrgyz-republic-to-improve-efficiency-and-quality-of-heat-supply-with-support-from-the-world-bank |
| | | | 1 680 684,06 | 19 218,80 | 2019 - 2025 | Grant | | | |
| Irrigated Agriculture Development Project in Issyk-Kul and Naryn Regions | The project aims to provide priority support to smallholder farms to maximize agricultural productivity and increase production, reduce post-harvest losses, and enhance economic returns. Key activities at the farm level include investments in climate-resilient irrigation infrastructure and land management, as well as the introduction of climate- | Ministry of Water Resources, Agriculture and Processing Industry of the | 1,749,000.00 | 20,000.00 | 2021 – 2025 | Concessional Loan | Agriculture, Forestry, Fisheries | Development and rehabilitation of 4 reservoirs and approximately 190 km of irrigation canals to improve access to water for 20,600 hectares of farmland; strengthened climate resilience, improved rural incomes, and increased agricultural productivity. | IsDB, based on project components: https://www.isdb.org/project-procurement/tenders/2020/gpn/gpn-irrigated-agriculture-development-issyk-kul-and-naryn-regions-project |

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|---|---|---|---|---|---|---|---|---|---|
| | | | *thousand KGS* | *thousand USD* | | | | | |
| | smart agricultural practices. Post-harvest support will be selective and aimed at increasing the value-added of key crops (potatoes, fruits, and vegetables) by transforming them into higher-value products. This will be achieved through investments in agricultural storage facilities, primary processing and packaging units, quality control laboratories, and certification. Additional institutional support will be provided to strengthen market linkages across the value chain. | Kyrgyz Republic | | | | | | | |
| GRCF2 W2 – Bishkek Buses Project | Provision of a sovereign loan of up to EUR 25.0 million to the Kyrgyz Republic for subsequent on-lending to the City of Bishkek in favor of the Bishkek Passenger Motor Transport Enterprise (BPATP). The project finances the rehabilitation of the bus fleet and the procurement of new city buses operating on compressed natural gas (CNG). | Bishkek City Municipality | 1,654,683.07 | 18,921.48 | 2021 – 2025 | Non-concessional Loan | Transport and Storage | By 2024, 124 CNG buses were procured and put into operation, replacing the old diesel bus fleet. This has improved public transport coverage, reduced greenhouse gas emissions and air pollution, and enhanced depot infrastructure and service reliability. | EBRR, based on project components: https://www.ebrd.com/home/work-with-us/projects/psd/51598.html |
| Issyk-Kul Ring Road Reconstruction Project | The project aims at the full rehabilitation and widening of a 33 km road section (Tyup–Karakol). | Ministry of Transport and Communications of the Kyrgyz Republic | 1,560,982.50 | 17,850.00 | 2021 – 2024 | Concessional Loan | Transport and Storage | The project enhances climate resilience through the modernization of drainage and snow protection systems. It is also expected to reduce vehicle emissions by ensuring smoother traffic flow and shorter travel times. | IsDB Project, https://www.isdb.org/project-procurement/tenders/2021/gpn/gpn-reconstruction-issyk-kul-ring-road-project?utm_source |
| Sustainable Rural Water Supply and Sanitation Project | Expansion of investments in the rural water supply and sanitation sector to cover new areas and districts, as well as support for the implementation and, where necessary, extension of the State Program for | Community Development and Investment | 1,481,329.45 | 16,939.16 | 2017 – 2025 | Concessional Loan | Industry, Mining, Construction | Improved climate-resilient water supply and sanitation services for approximately 200,000 rural residents in 94 villages; modernization of 57 water supply and | IDA project, based on project components https://www.worldbank.org/en/news/press-release/2023/07/06/the- |

| Project Title | Project Description | Implementing Agency | Received Amount | | Period | Financial tool | Sector | Outputs and Results | Additional Information |
|---|---|---|---|---|---|---|---|---|---|
| | | | *thousand KGS* | *thousand USD* | | | | | |
| | the Development of Drinking Water Supply and Sanitation Systems. | Agency (ARIS) | | | | | | sanitation systems in public institutions, which improved public health, water safety, and adaptive capacity to climate variability. | kyrgyz-republic-to-improve-efficiency-and-quality-of-heat-supply-with-support-from-the-world-bank |
| Climate-Resilient Water Supply Project in the Kyrgyz Republic | Reconstruction of irrigation water supply infrastructure, including intakes, pumping stations, main canals, and distribution networks at the Aravan-Ak-Buura Irrigation Complex in Osh Region. | Ministry of Water Resources, Agriculture, and Processing Industry of the Kyrgyz Republic | 1,299,472.60 | 14,859.61 | 2022 – 2027 | Non-concessional Loan | Agriculture, Forestry, Fisheries | Improved efficiency of irrigation systems reduced water losses and electricity consumption, contributing to lower greenhouse gas emissions and enhanced resilience of agriculture to climate variability over an area of about 8,700 hectares. | EBRD project, based on project components, https://www.ebrd.com/home/work-with-us/projects/psd/49793.html |
| Kyrgyz Republic Resilience Enhancement Project | The project aims to strengthen the capacity of the Government of the Kyrgyz Republic to respond to emergencies and natural disasters, improve preparedness, reduce negative financial impacts on the budget and population, and create safer learning conditions for children. | Ministry of Emergency Situations of the Kyrgyz Republic | 1,234,401.26 | 14,115.51 | 2018 – 2027 | Concessional Loan | Disaster Prevention and Preparedness | Strengthening resilience to natural disasters and climate change through nationwide early warning coverage, landslide risk monitoring at 57 high-risk sites, and seismic retrofitting of 40 schools; enhancing emergency response capacity and reducing vulnerability to climate-induced hazards. | World Bank project, based on project components, https://documents1.worldbank.org/curated/en/099052725100036206/pdf/P162635-f72260df-84e4-40ea-b69e-1bc84eae2170.pdf |
| | | | 1 012 741,83 | 11 580,81 | 2018 - 2027 | Grant | | | |

| Project Title | Project Description | Implementing Agency | Received Amount | | Period | Financial tool | Sector | Outputs and Results | Additional Information |
|---|---|---|---|---|---|---|---|---|---|
| | | | *thousand KGS* | *thousand USD* | | | | | |
| Landslide Risk Management Sector Project | Reducing landslide risk to protect rural communities in the Kyrgyz Republic. The project introduces advanced international practices and technologies to improve landslide risk reduction and monitoring. It will lower risks to communities and infrastructure from landslide hazards through: (i) implementation of engineering measures to mitigate landslide impacts, (ii) enhancement of landslide monitoring systems, and (iii) strengthening of landslide risk management capacity. | Ministry of Emergency Situations of the Kyrgyz Republic | 1,148,208.44 | 13,129.89 | 2021 – 2028 | Grant | Agriculture, Forestry, Fisheries | Landslide mitigation and early warning systems have been introduced in high-risk areas. The project is designed to achieve the following outcomes: (i) reduction of human and material losses from climate- and geophysical-related disasters, and (ii) increased protection of people and territories from emergencies to support sustainable development. The overall result will be reduced vulnerability and exposure of communities and infrastructure to landslide hazards. | ADB project, based on project components, https://www.adb.org/projects/53022-001/main |
| Urban Transport | Transition to a zero-emission transport sector in the Kyrgyz Re- | Bishkek City Hall | 2,186,250.00 | 25,000.00 | 2020 – 2027 | Concessional Loan | Transport and Storage | Improved air quality and reduced greenhouse gas emissions in Bishkek | ADB project, based on project components, |

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|---|---|---|---|---|---|---|---|---|---|
| | | | *thousand KGS* | *thousand USD* | | | | | |
| Electrification Project | public. The project includes four interrelated outcomes: (i) modernization of the zero-emission bus fleet in Bishkek, (ii) upgrading of bus depot infrastructure, (iii) establishment of a pilot “green mobility” corridor, and (iv) strengthening the resilience of bus operations in Bishkek. The project aims to reduce reliance on imported fossil fuels, lower operating costs, improve air quality, and cut carbon emissions, thereby enhancing energy security, improving public health, and contributing to climate change mitigation. | | 2 204 350,75 | 25 206,98 | 2020-2027 | Grant | | through electrification of public buses powered by a nearly zero-emission hydropower-based grid — projected reduction of emissions per electric bus by 70–85% compared to diesel alternatives. | https://www.adb.org/sites/default/files/project-documents/54123/54123-001-iee-en_0.pdf |

| Project Title | Project Description | Implementing Agency | Received Amount | | Period | Financial tool | Sector | Outputs and Results | Additional Information |
|---|---|---|---|---|---|---|---|---|---|
| | | | *thousand KGS* | *thousand USD* | | | | | |
| Regional Project on the Development of Climate-Resilient Pastoral Communities | The project aims to strengthen the resilience of pastoral communities in the Kyrgyz Republic to climate change through sustainable pasture management, income diversification, and institutional capacity building. It promotes environmentally sound solutions to land degradation, supports climate-resilient agricultural practices, and enhances local governance of pasture use. | Ministry of Water Resources, Agriculture and Processing Industry of the Kyrgyz Republic | 1,088,963.52 | 12,452.41 | 2022 – 2027 | Grant | Agriculture, Forestry, Fisheries | The project enhances climate resilience through improved management of 23 pastures, reforestation and restoration of 2,500 ha of natural forests, and planting of 1,500 ha of climate-resilient tree species. It provides sustainable livelihoods for 2,800 rural entrepreneurs (about 15,000 people), supports gender-sensitive adaptation, and contributes to building long-term capacity in climate-resilient value chains for 3,000 women, men, and youth. | IFAD – Adaptation Fund, based on project components, https://www.adaptation-fund.org/wp-content/uploads/2022/03/AFB.PPRC_.29.10_Proposal-for-Kyrgyzstan-1.pdf |
| Reconstruction of the Suusamyr–Talas–Taraz Road, Phase IV | The project aims to improve the efficiency, safety, and capacity of the road section to accommodate current and future traffic flows, enhance regional and local transport accessibility, and increase transit freight in the region. In addition, the project supports regional trade, tourism, and integration with neighboring countries. This will be achieved by modernizing the existing section from the city of Talas to the Kichi-Kapka border crossing of the Suusamyr–Talas–Taraz corridor (93 km). | Ministry of Transport and Communications of the Kyrgyz Republic | 918,225.00 | 10,500.00 | 2023 – 2025 | Concessional Loan | Transportation and Storage | Reconstruction of 93 km of high-altitude road has increased climate resilience through improved drainage, slope stabilization, and landslide protection, ensuring year-round access and reducing climate-related risks for transport and trade. | IsDB, based on project components, https://www.isdb.org/project-procurement/tenders/2023/gpn/reconstruction-suusamyr-talas-taraz-road-phase-iv-km-1046-1976-gpn |

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|---|---|---|---|---|---|---|---|---|---|
| | | | *thousand KGS* | *thousand USD* | | | | | |
| Resilience of Rural Communities to Climate Change and Natural Disasters | The project aims to strengthen climate resilience and reduce the vulnerability of rural communities in Kyrgyzstan, particularly in southern and mountainous regions, in the face of increasing climate and natural hazards such as droughts, floods, landslides, and severe frosts. | World Food Programme (WFP) | 896,896.89 | 10,256.11 | 2022 – 2027 | Grant | Disaster Prevention and Preparedness | WFP restored and reconstructed more than 494 disaster protection facilities (such as dams and diversion channels), benefiting over 16,000 vulnerable households in target areas. WFP also supported the Ministry of Emergency Situations (MES) in strengthening national disaster information systems. | Switzerland, main project objective. https://www.eda.admin.ch/countries/kyrgyzstan/en/home/international-cooperation/projects.html/content/dezaprojects/SDC/en/2022/7F10773/phase1.html |
| Water Supply and Sanitation – Large Systems | Support for the modernization of water supply and sanitation systems. | Water Resources Agency | 744,429.53 | 8,512.63 | 2017 – 2025 | Non-concessional loan | Water Supply and Sanitation | Modernization of water supply and sanitation systems in rural communities improved service reliability for the population, reduced emissions through energy-efficient infrastructure, increased climate resilience, and strengthened utility capacity for sustainable service delivery. | EBRD, based on project components https://www.ebrd.com/home/news-and-events/news/2017/ebrd-eu-and-eib-invest-us-30-million-in-water-upgrades-in-the-kyrgyz-republic.html |
| Climate Resilience and Disaster Risk Reduction in Water Resources Management | The project will enhance the resilience of the water sector to climate change and natural disasters by modernizing and maintaining infrastructure in good condition, improving water resource management in agriculture and on farms, and increasing the efficiency of disaster risk management. Project activities include both structural (construction works and equipment procurement) and non-structural (capacity building and demonstration activities) measures. Activities will focus on the Fergana Valley in the southwest and the Chu River Basin | Ministry of Emergency Situations of the Kyrgyz Republic and the Water Resources Agency | 667,243.50 | 7,630.00 | 2019 – 2026 | Concessional loan | Water Supply and Sanitation | Modernization of irrigation systems and early warning infrastructure in the Chu and Fergana basins improved water use efficiency, reduced climate risks on approximately 20,000 ha of agricultural land, and strengthened resilience to droughts, floods, and natural disasters. Losses in agriculture and water management from extreme weather events were reduced. | Asian Development Bank, based on project components. https://www.adb.org/projects/51081-002/main |

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|---|---|---|---|---|---|---|---|---|---|
| | | | *thousand KGS* | *thousand USD* | | | | | |
| | in the north, which are prone to floods, landslides (including mudflows), and droughts that are expected to intensify due to climate change. | | | | | | | | |
| Rural Water Supply and Sanitation Development Program in Naryn Region | Ensuring reliable access to safe drinking water and improved sanitation conditions. | Ministry of Water Resources, Agriculture and Processing Industry of the Kyrgyz Republic | 596,098.29 | 6,816.45 | 2019 – 2025 | Grant | Water Supply and Sanitation | Improved inclusive and reliable access to safe drinking water and sanitation for rural communities in Naryn Region. | Asian Development Bank, based on project components. https://www.adb.org/projects/52256-001/main |

| Project Title | Project Description | Implementing Agency | Received Amount | | Period | Financial tool | Sector | Outputs and Results | Additional Information |
|---|---|---|---|---|---|---|---|---|---|
| | | | *thousand KGS* | *thousand USD* | | | | | |
| Climate-Resilient Agricultural Value Chain Development Project | The project aims to increase the adaptive capacity and income resilience of approximately 8,000 direct and 20,000 indirect beneficiaries, thereby reducing vulnerability to climate shocks. The proposed project will strengthen food security at both the household and national levels through climate-resilient horticultural value chains. It will help participating financial institutions (PFIs) provide more structured credit products to small and medium agribusiness enterprises, including aggregators, collectors, processors, and exporters, for the procurement of fruits and vegetables | Ministry of Water Resources, Agriculture and Processing Industry of the Kyrgyz Republic | 592,491.24 | 6,775.20 | 2024 – 2029 | Grant | Industry, Mining, Construction | Supports the development of climate-resilient agriculture in Kyrgyzstan by financing climate-optimized technologies such as drip irrigation, cold storage, and resource-efficient processing in the dairy and horticulture sectors. The project aims to improve adaptive capacity and income resilience of approximately 8,000 direct and 20,000 indirect beneficiaries, reducing vulnerability to climate shocks. It pro- | Asian Development Bank, based on project components. https://www.adb.org/projects/51276-001/main |

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|---|---|---|---|---|---|---|---|---|---|
| | | | *thousand KGS* | *thousand USD* | | | | | |
| | such as apples, apricots, cucumbers, garlic, onions, pears, and potatoes. This will enhance processing and storage capacities and reduce post-harvest losses through the establishment of modern and efficient processing, warehousing, and cold storage facilities. | | 577 170,00 | 6 600,00 | 2024-2029 | Concessional loan | | motes low-emission practices such as resource efficiency, crop rotation, and improved manure management, contributing to greenhouse gas emission reductions and enhanced production resilience. | Asian Development Bank, based on project components. *https://www.adb.org/projects/51276-001/main* |
| Sustainable Rural Water Supply and Sanitation Project | Expansion of water supply and sanitation infrastructure considering climate change, and implementation of pilot sanitation solutions. Institutional capacity strengthened to enhance climate resilience and sustainability in the rural water supply and sanitation sector. | | 566 676,00 | 6 480,00 | | Grant | | Improved inclusive and reliable access to safe water supply and sanitation for rural communities in Naryn region. | |

| Project Title | Project Description | Implementing Agency | Received Amount | | Period | Financial tool | Sector | Outputs and Results | Additional Information |
|---|---|---|---|---|---|---|---|---|---|
| | | | *thousand KGS* | *thousand USD* | | | | | |
| Climate Services and Livelihood Diversification | Support for vulnerable rural communities to better manage climate risks, including increased weather variability. This includes expanding the provision of climate services, local-level adaptation planning, construction of small-scale infrastructure to reduce climate risks, and diversification of income sources to enhance overall economic resilience of communities facing growing risks to the agricultural sector. | World Food Programme (WFP) | 708,065.16 | 8,096.80 | 2018 – 2026 | Grant | Disaster Risk Reduction and Preparedness | Delivered climate services to approximately 102,000 people and diversified climate-resilient livelihoods for more than 20,400 households in Osh, Batken, and Naryn, supporting small-scale infrastructure for climate risk reduction and strengthening local adaptation planning. | GCF, project interventions, https://www.greenclimate.fund/project/sap002 |
| Green Economy and Sustainable Private Sector Development | The project supports the transition to a "green" economy, particularly in the tourism and agriculture sectors. With generous financial support from the Governments of Switzerland and Germany, as well as the European Union (which joined as a co-donor for the first time), the international cooperation agency (GIZ) will address challenges in the above sectors through improvements in green economy policies and practices. The transition of the economy to sustainable development will also create new and decent jobs. | Ministry of Economy and Trade of the Kyrgyz Republic | 287,115.84 | 3,283.20 | 2020 – 2026 | Grant | Industry, Mining, Construction | Evidence-based strategies were developed to address environmental, social, and labor issues (including GEP II, Monitoring System, Green Taxonomy, GEM, and RDF green zones). The Green Economy Modeling Institute (GEM) was established with a developed business model. | Switzerland |
| Other projects* | 281 projects | | 53,004,895.6 | 606,116.59 | | | | | |
| **Total*** | | | **115,188,118.9** | **1,317,188.32** | | | | | |

Note:
*Exchange rate: 1 USD = 87.45 KGS
** Full information on projects for the period 2017–2023 is available on the OECD website: https://webfs.oecd.org/climate/RecipientPerspective/, and data for 2024 are available on the IATI website: https://iatistandard.org/en/