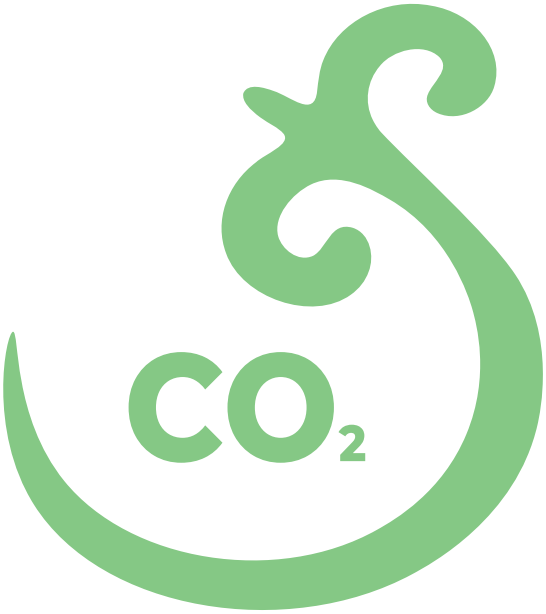
CONCEPT

FOR ACHIEVING CARBON NEUTRALITY IN THE KYRGYZ REPUBLIC



Bishkek, 2025

Concept for Achieving Carbon Neutrality in the Kyrgyz Republic

This Concept was approved by the Resolution of the Cabinet of Ministers of the Kyrgyz Republic No. 397 dated July 3, 2025, *"On the Approval of the Concept for Achieving Carbon Neutrality in the Kyrgyz Republic and the Action Plan for the Implementation of the First Phase of the Concept for Achieving Carbon Neutrality in the Kyrgyz Republic."*

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CHAPTER 1. INTRODUCTION

Currently, climate change has become the most pressing global challenge, bringing not only climate and environmental consequences but also social, economic and governance-related impacts. According to the Intergovernmental Panel on Climate Change (IPCC), global warming is expected to have severe negative impacts on all aspects of human life unless immediate actions are taken to address it. It is widely recognized that climate change is largely driven by human activities; therefore, decisive measures must be taken to reduce greenhouse gas emissions, which are the main drivers for the rise in global temperature.

To address the threat of climate change, the Paris Agreement was adopted in December 2015 at the Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC). Under this agreement, all countries agreed to join their efforts and take on voluntary actions to reduce greenhouse gas emissions and co-operate in adapting to the worst consequences of climate change. To date, the Paris Agreement has been signed by 194 countries worldwide.

The Kyrgyz Republic signed the Paris Agreement in 2015 and ratified it in 2019 through the Law of the Kyrgyz Republic "On the Ratification of the Paris Agreement under the United Nations Framework Convention on Climate Change, signed on December 12, 2015, in Paris," dated November 11, 2019, No. 125. This ratification legally binds Kyrgyzstan to comply with all provisions of the Paris Agreement.

Kyrgyzstan has consistently demonstrated commitment to the Paris Agreement by regularly preparing its nationally determined contributions (NDCs) to the Paris Agreement and submitting biennial reports on the progress in NDC implementation.

The relevance of the Kyrgyz Republic's participation in the implementation of the Paris Agreement lies in the fact that Kyrgyzstan is highly vulnerable to the impacts of climate change. At present, significant negative impacts are already being observed: the number of natural disasters is increasing, crop yields are declining, glaciers are melting at an accelerated pace, significant changes in river runoff are occurring, and there is a shortage of supply of drinking water.

IMPACTS OF CLIMATE CHANGE IN KYRGYZSTAN

Mountain areas have proven to be particularly vulnerable, primarily due to accelerated glacier melting, which leads to mudflows and, most importantly, poses a threat of prolonged and widespread water shortages throughout the region. According to forecasts, by 2050 the glacier area in Kyrgyzstan will be reduced by half, exacerbating not only national but also transboundary regional problems of scarcity of water needed for drinking and crop cultivation. Climate change also leads to degradation of soil and pasture lands, which in turn creates a real threat to the country's food security.

Climate change requires adjustments of the national development plans and timely responses that enable building social, environmental, and economic resilience. The role of the government can no longer be limited to providing emergency assistance but rather need to expand investing in reducing climate risk and adaptation.

Conceptually, carbon neutrality is understood as achieving a balance between carbon dioxide emissions and their absorption from the atmosphere in equal volume. Therefore, striving for carbon neutrality is an important instrument for the sustainable development of the Kyrgyz Republic and for ensuring national security. A key task in this regard is to establish mechanisms that involve all stakeholders in processes aimed at reducing greenhouse gas emissions and minimizing the negative consequences of climate change.

It is also important to integrate gender perspective in the analyses, decision-making processes and strategic documents related to sustainable development and climate change primarily because women and men respond differently to changes in the environment and may be affected differently by the consequences of climate change.

Under the Paris Agreement, developing countries vulnerable to climate change, including the Kyrgyz Republic, may receive financial support To access such support, it is necessary to develop and adopt a concept for achieving carbon neutrality. Equally important is the availability of a climate change adaptation plan alongside efforts to reduce greenhouse gas emissions. The country's nationally determined contribution aligns with the global goal of limiting the average temperature increase to no more than 1.5°C compared to pre-industrial levels.

The Kyrgyz Republic announced that it aims to achieve carbon neutrality by 2050. This Concept has been developed to define priority actions for reducing greenhouse gas emissions in line with the goals of the Paris Agreement.

The purpose of this Concept is, therefore, to establish a foundation for developing a detailed comprehensive Strategy through 2050, as well as to ensure that ministries and agencies make the necessary adjustments to sectoral development programs considering the Kyrgyz Republic's commitment to achieving carbon neutrality.[1]

This Concept is aimed at improving interagency coordination and territorial governance, including the revision of regional development documents – from the ayil okmotu (village administrations) to the oblasts of the Republic.

The Concept represents a document that defines strategic directions and systematic framework for 25-year timeframe and does not establish firm approaches for institutional and organizational structures. The systemic framework proposed in the Concept is designed to ensure coordinated action by all stakeholders in achieving sustainable climate development.

The Concept objectively presents a modern vision of how all levels of public administration at the national levels and local self-government bodies should focus their efforts on effectively achieving carbon neutrality by 2050, acting within the priority policy areas of mitigation and adaptation reflected in this Concept and the associated Action Plan[2].

It is important to note that this Concept and the associated Action Plan covers also the coal industry, which remains economically significant for the country. To that end, the Concept envisages measures to reduce dependence on coal, which are aligned with the current national policy in the fuel and energy sector and are already its components. Relevant measures include those that are aimed at improving energy efficiency of small boilers, further increase in natural gas supply to households within the framework of Gazprom Kyrgyzstan LLC's General Scheme of Gas Supply and Gasification of the Kyrgyz Republic project and development of renewable energy sources. An approach to the Concept based on such measures makes it possible to meet economic needs while simultaneously contributing to achieving carbon neutrality.

[1] Resolution of the Cabinet of Ministers of the Kyrgyz Republic No. 397, dated July 3, 2025 «On the Approval of the Concept for Achieving Carbon Neutrality in the Kyrgyz Republic and the Action Plan for the Implementation of the First Stage of the Concept for Achieving Carbon Neutrality in the Kyrgyz Republic.»

[2] The Action Plan of this Concept outlines mitigation and adaptation measures and policy actions across, including estimated mitigation potential, cost estimates, responsible agencies, and contributions from the private and civil sectors. It serves as an internal national operational document for implementation.

The main goal of this Concept is to ensure the well-being of the people of the Kyrgyz Republic in the future, under challenging climate conditions, without the loss of livelihoods, while preserving the natural environment.

The main approach underlying this Concept includes the following elements:

A systemic perspective on the comprehensive set of measures to achieve carbon neutrality, with due attention to the synergy of planned mitigation and adaptation measures.

Fulfillment of the commitments enshrined in the Kyrgyz Republic NDC, in accordance with the country's current needs and considering international requirements and best practices.

Consideration of local conditions and territorial characteristics, including natural, geographic, climatic, socio-economic, socio-cultural contexts, and others.

Strengthening the institutional and organizational framework for implementing adaptation and mitigation measures, including enhancement of the regulatory and legal frameworks, integration of climate information into the national statistical system, and provision of climate services to a wide range of stakeholders (state and local authorities, the population, the non-governmental sector, and the business community).

CHAPTER 2. GENERAL ASSESSMENT OF THE CURRENT SITUATION, ACHIEVEMENTS AND CHALLENGES

§ 1. Institutional and Organizational Framework for Low-Carbon Development

The foundation for low-carbon development is regulated by strategic and programmatic documents of the Kyrgyz Republic.

The long-term strategic legislative framework of the climate policy is defined in the National Development Strategy of the Kyrgyz Republic for 2018–2040, adopted by the Decree of the President of the Kyrgyz Republic "On the National Development Strategy of the Kyrgyz Republic for 2018–2040" of October 31, 2018, No. 221. This Strategy envisages shaping Kyrgyzstan's image as a country with "negative CO_2 emissions" and as the "greenest" country in the region. The provisions of the Strategy were further developed in 2018 through the approval of the Concept of Green Economy in the Kyrgyz Republic – "Kyrgyzstan: Country of Green Economy" by Resolution of the Jogorku Kenesh of the Kyrgyz Republic of June 28, 2018, No. 2532-VI, followed by the adoption of the Program for the Development of the Green Economy for 2019–2023, approved by Resolution of the Government of the Kyrgyz Republic "On Approval of the Program for the Development of the Green Economy in the Kyrgyz Republic for 2019–2023" of November 14, 2019, No. 605. This program covers seven priority sectors, including energy, agriculture, industry, low-carbon and environmentally friendly transport, sustainable tourism, waste management, and "green" cities. Work is currently underway to prepare the subsequent Green Economy Development Program until 2028.

As part of the implementation of the above-mentioned National Strategy, the National Development Program of the Kyrgyz Republic until 2026 was approved by the Presidential Decree "On the National Development Program of the Kyrgyz Republic until 2026" of October 12, 2021, No. 435. One of its targets is the reduction of greenhouse gas emissions, as well as the development of a monitoring system based on national climate statistics and the introduction of a national system for Monitoring, Reporting and Verification (MRV).

Priority directions of climate policy in various sectors are regulated by the Presidential Decree "On Measures to Ensure Environmental Security and Climate Resilience" of March 19, 2021, No. 77.

In accordance with the National Security Concept of the Kyrgyz Republic, global and regional climate and environmental changes, whose consequences include the reduction of glacier areas and water resources in the country, are defined as external threats to national security. The Concept also regulates the conduct of a well-balanced and comprehensive domestic and foreign policy by authorized state bodies in the emerging climate reality.

The institutional framework for climate action of the national business community is defined by the Business Development Program of the Kyrgyz Republic until 2026, which includes a few measures aimed at creating conditions in the private sector to stimulate the introduction of green technologies and the implementation of environmental, social, and governance principles.

Commitment to the climate agenda is also embedded in sectoral programs and action plans. In general, most adaptation and mitigation measures are, to some extent, reflected in the existing national program documents in the areas of "green economy," public health and healthcare system development, biodiversity conservation, comprehensive protection of the population and territory of the Kyrgyz Republic from emergencies, forestry, irrigation development, and gas supply and gasification. However, in territorial development programs (regional and local self-government), issues of ecology, environmental protection, and climate security are presented only partially; specific environmental programs and/or climate adaptation programs at oblast or district level are practically absent.

The country's evolution of adaptation and mitigation policies is reflected in the Voluntary National Review on the Achievement of the Sustainable Development Goals in the Kyrgyz Republic, presented to the international community in 2020, where commitment to the climate agenda is reflected in Kyrgyzstan's contribution to achieving Sustainable Development Goal 13 – Climate Action.

The Kyrgyz Republic has made important progress and continues to actively move towards establishing a national climate statistics system and introducing a national MRV system for the preparation of international climate reporting, strengthening the country's climate image, and providing an effective mechanism for tracking progress in the implementation of adaptation and mitigation policies.

Systematically developed international climate reporting not only allows assessing the current state of the country's contribution to addressing global climate challenges but also forms an information basis for preparing national greenhouse gas inventory across types, key sectors, and subcategories.

Work is actively underway to establish a climate services system in the Kyrgyz Republic as a national information platform on climate adaptation, planning, and implementation of measures to reduce climate impact. For instance, the National Statistical Committee of the Kyrgyz Republic is developing a climate statistical monitoring system covering various aspects of public life, economic development, and the well-being of the population. Combined with the emerging national MRV system, official statistics will provide a sustainable platform for tracking progress and timely adjusting national climate policy. The Kyrgyzhydromet is developing climate products and indices, as well as relevant specialized data on climate change and variability for stakeholders, primarily representatives of the private sector.

The functional basis of government agencies has been optimized and strengthened – functions have been updated and necessary competencies expanded, with consistent efforts to involve the private sector, non-governmental organizations, academia, and business associations in decision-making and implementation across various aspects of national climate policy. Given the country's long-standing experience in climate reporting, particular attention has been paid to improving mechanisms of interaction among all stakeholders, establishing effective information exchange and access to new climate-related data.

Over the past several years, the institutional framework for coordination of all stakeholders has been significantly strengthened – climate-related roles and functions of the Ministry of Natural Resources, Ecology and Technical Supervision of the Kyrgyz Republic, responsible for developing and implementing national climate policy, have been updated. To consolidate efforts in climate change and green economy coordination, the Coordinating Council on Climate Change, Ecology, and Sustainable Development was established in 2020.

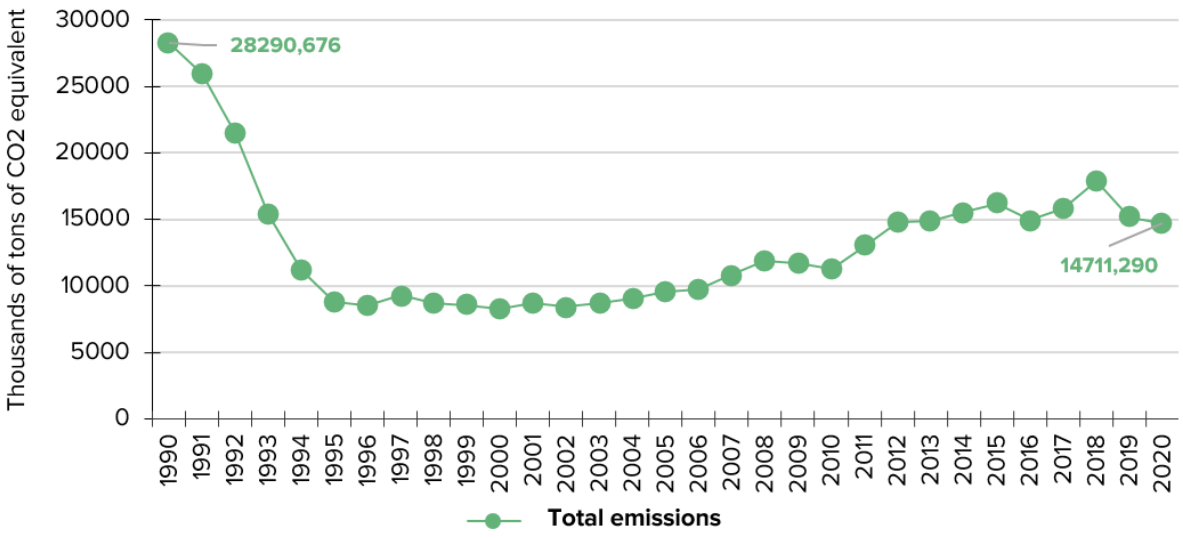
Capacity-building for government agencies, civil society organizations, and the expert community in climate-related issues remains a priority area: current aspects of climate change, climate risks, climate finance, climate vulnerability and adaptive capacity of the economy and specific groups (private sector, NGOs, the population); building monitoring systems, developing climate change indicators, and data production.

§ 2. Greenhouse Gas Emissions

Kyrgyzstan is among the countries with relatively low levels of greenhouse gas emissions. In 2020, the total greenhouse gas emissions amounted to 14,711.290 thousand tons of CO_2 equivalent, while removals accounted for 10,960.100 thousand tons of CO_2, resulting in net emissions of 3,751.190 thousand tons of CO_2 equivalent. The Kyrgyzstan's share of the total global greenhouse gas emissions amounts to less than 0.032%.

The greenhouse gas emissions trend between 1990 and 2020 is presented in Figure 1. Compared to 1990, Kyrgyzstan's total greenhouse gas emissions decreased by 48.53% in 2020. Between 1995 and 2006, Kyrgyzstan had a negative carbon balance; however, during the period from 2010 to 2020, the country's total greenhouse gas emissions increased by 30.56%.

Figure 1. Greenhouse gas emissions trend of the Kyrgyz Republic



Carbon dioxide (CO_2) accounts for the largest share of around 55% of Kyrgyzstan's total greenhouse gas emissions, followed by methane (CH_4), nitrous oxide (N_2O), and five types of hydrofluorocarbons.

According to the IPCC methodology, emissions are assessed by the following sectors:

Energy (including transport)

Industrial processes and product use

Agriculture

Forestry and other land use

Waste

Quantitative data on emissions by these sectors are presented in Table 1.

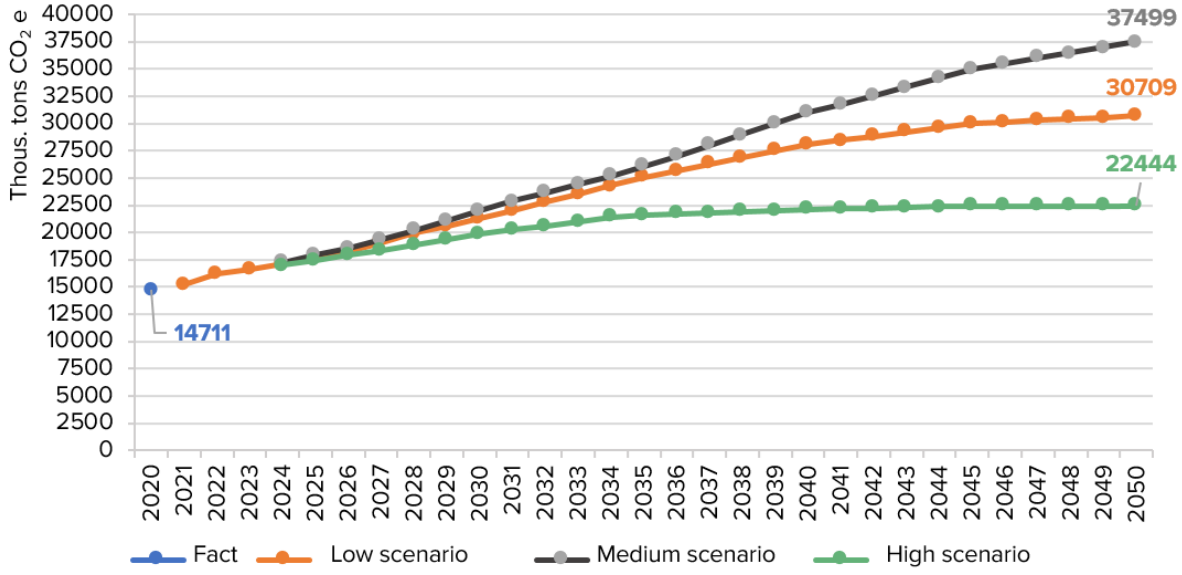
Table 1. Greenhouse gas emissions in Kyrgyzstan between 1990 and 2020 by sector

Year	Energy	IPPU	Agriculture	LULUCF	Waste
1990	20529,719	871,638	6437,637	-10273,525	451,682
1995	5398,675	169,149	2814,657	-10323,647	423,188
2000	4421,042	227,930	3210,044	-10303,877	417,481
2005	5213,316	482,930	3414,776	-10205,986	429,963
2010	6273,356	431,877	4089,427	-10334,544	472,887
2015	9920,106	944,071	4803,018	-10336,530	536,210
2020	7648,189	1132,175	5329,990	-10960,100	600,936

The main sources of greenhouse gas emissions are: energy sector, (74% in 1990), agriculture (16.1%), waste (5.5%), industrial processes, 4.2%), and land-use change, and forestry (0.2%).

The projections of future greenhouse gas emissions and removals under the "business-as-usual" scenario—that is, without mitigation or climate change adaptation measures—for the period 2020–2050 is presented in Figure 2.

Figure 2. Projections of greenhouse gas emissions until 2050



All data on greenhouse gas emissions presented in this Concept were calculated based on the internationally accepted IPCC methodology, applied by all countries committed under the Paris Agreement.

Based on the calculations conducted by the national technical group (a team of sectoral experts responsible for preparing data for the NDC, National Communications, and other international climate reporting), all data have been harmonized through the work of the relevant interagency working group. The results have been reviewed and verified by experts representing the national scientific community. As part of the implementation of the Quality Assurance and Quality Control Work Plan, independent experts and specialists from research and academic institutions were engaged to carry out comprehensive verification and validation of documentation and resulting datasets.

As outlined in the updated NDC (2021), Kyrgyzstan's overall mitigation target is to reduce greenhouse gas emissions by 16.63% by 2025 and by 15.97% by 2030 under the business-as-usual scenario. With international support, emissions reductions could reach 36.61% by 2025 and 43.62% by 2030 compared to the same scenario.

To achieve the ambitious mitigation goals, systemic work has been launched in the country across key priority areas aimed at addressing relevant climate challenges.

Direct mitigation measures to reduce greenhouse gas emissions are mostly identified in the energy sector and envisage switching the households and heat boilers to natural gas, improving building energy efficiency, developing electric transport, and expanding renewable energy sources. In agriculture, emission reductions are expected through expanding organic farming (already proven effective at demonstration sites), increasing livestock productivity by improving breeding, gradually reducing livestock numbers, and improving manure management. Increasing greenhouse gas removals is expected through expanding perennial plantations (especially intensive orchards) and, in the forestry sector, through reforestation and afforestation.

In all sectors, a set of regulatory measures, capacity building, and the development of the national MRV system are also envisaged.

The development of the National Adaptation Plan (NAP) contributes to strengthening institutions, enhancing vertical and horizontal coordination, and integrating climate risk considerations into land-use and business management decisions at national, regional, and local levels.

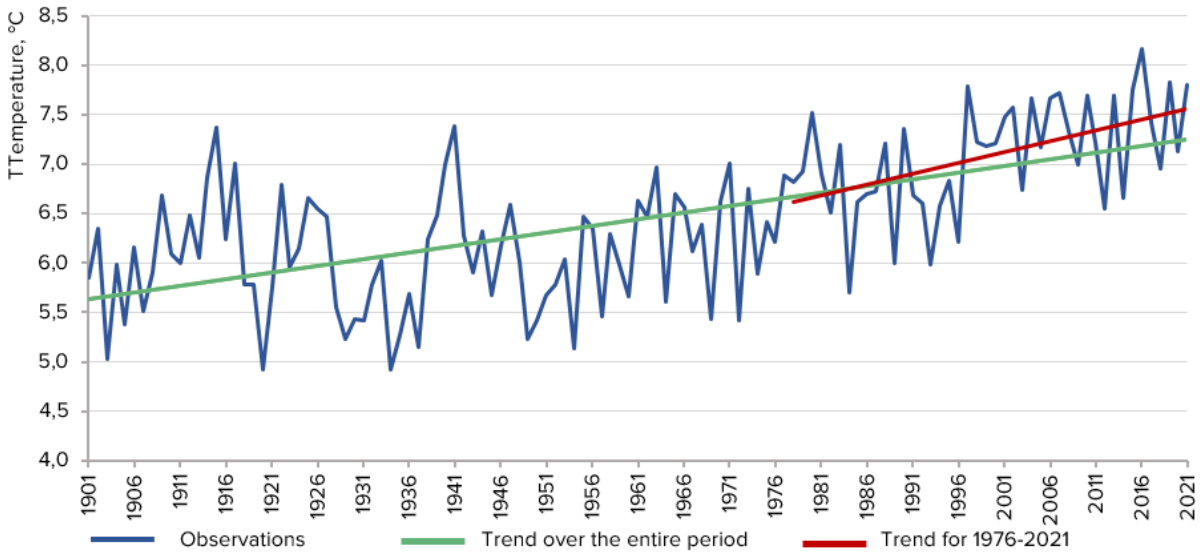
Sectoral and regional adaptation plans are under preparation, including climate adaptation plans for Osh, Jalal-Abad, and Batken regions, as well as one of the most vulnerable districts of Batken region. An updated roadmap and a mechanism for improving climate statistics have been developed, along with a list of interlinked climate and sectoral datasets for four vulnerable sectors, and the framework for a national climate services system as a foundation for adaptation planning.

§ 3. Climate Change

The Kyrgyz Republic, while being a country with relatively low greenhouse gas emissions, is among those particularly vulnerable to climate change. Currently, climate change adaptation has become most urgent across all regions of the country, which represent four distinct climatic zones.

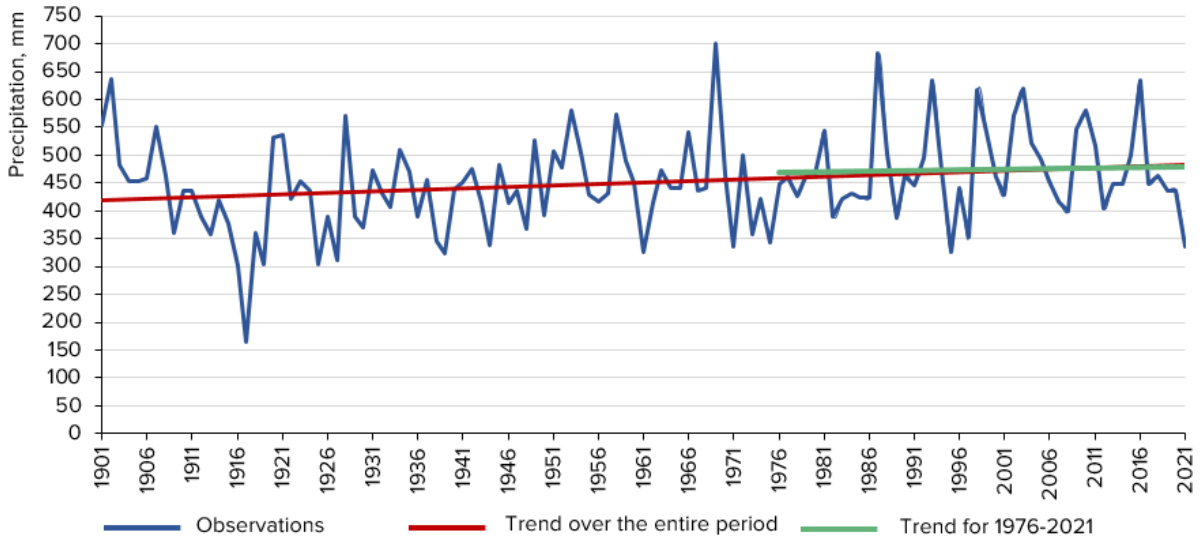
Long-term observations indicate a significant increase in air temperature across the country over the period 1901–2017 (Figure 3). For instance, at the beginning of the last century, the average annual temperature increased by approximately 0.1°C per decade, while during the period 1976–2017, the rate of increase doubled to 0.2°C per decade.

Figure 3. Dynamics of average annual air temperature in the Kyrgyz Republic, 1901–2021



The precipitation regime in the Kyrgyz Republic (Figure 4), in addition to significant spatial and seasonal variability, is characterized by interannual fluctuations and cyclical patterns.

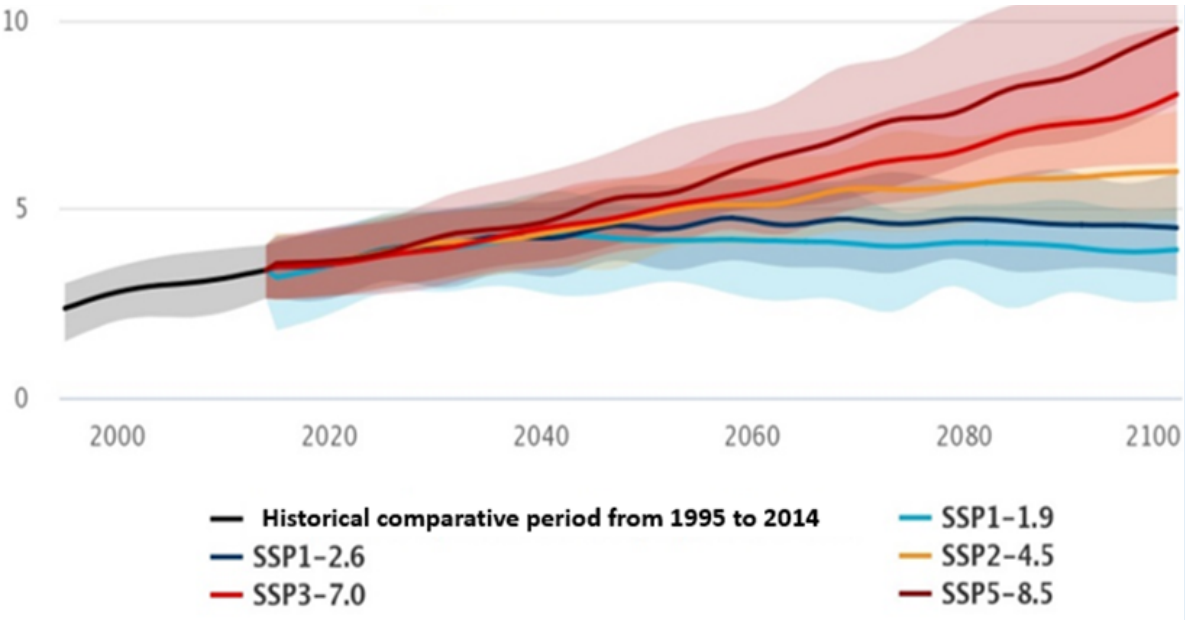
Figure 4. Dynamics and trends of precipitation in the Kyrgyz Republic, 1901–2021



For analyzing future climate change in Kyrgyzstan, assessments were conducted using coupled atmosphere-ocean general circulation models (AOGCMs) under the international CMIP6 project. The projections of future changes in air temperature relative to the historical period 1995–2014, based on a multimodel ensemble of the IPCC SSP (Shared Socioeconomic Pathway) scenarios until 2100, is shown in Figure 5.

Figure 5. Projected future changes in air temperature for Kyrgyzstan? and precipitation under different SSP scenarios[3]

[3] IPCC, 2021: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change.



Projections indicate that throughout the 21st century, temperatures in Kyrgyzstan will consistently rise under all scenarios. By the end of the century, the increase in average annual temperature is expected to reach nearly 6°C under the high-emission SSP5-8.5 scenario and approximately 3°C under the moderate SSP2-4.5 scenario.

Overall, since the beginning of the last century, the country has observed a slight upward trend in total annual precipitation – approximately 1% per decade. However, since the mid-1970s, the long-term trend has accelerated, with the rate of increase in average annual precipitation reaching 2% per decade.

According to multi-model ensemble CMIP6 projections for the territory of Kyrgyzstan, the current precipitation regime is generally expected to be maintained throughout the 21st century, with a slight upward trend. Under the moderate SSP2-4.5 scenario, a small increase in total annual precipitation of about 3% relative to the baseline period 1995–2014 is projected over the next 20 years. During 2040–2050, a slight increase of approximately 4% from the current period is expected.

The consequences of changes in average temperature and precipitation are manifested in the increased occurrences of landslides in Osh and Jalal-Abad regions. All regions of the country, except Naryn, are vulnerable to mudflows and floods. The negative impacts of heavy rainfalls are particularly observed in Jalal-Abad, while the Issyk-Kul region is most vulnerable to hurricane-force winds.

§ 4. Impacts of Climate Change

The vulnerability, risk, and impact assessment conducted as part of the preparation of the Fourth National Communication of the Kyrgyz Republic to the UNFCCC confirmed the vulnerability of seven sectors, as presented in Table 2.

Table 2. Types of Climate Change Impacts on Vulnerable Sectors

	Vulnerable Sectors	Types of Climate Change Impacts
1	Water Resources	1. Changes in river basin water flow 2. Reduced water availability for the population and the economy 3. Deterioration of surface and groundwater quality

	Vulnerable Sectors	Types of Climate Change Impacts
2	Agriculture	1. Deterioration of biochemical regulatory processes in soil ecosystems 2. Changes in the productive potential of pastures and livestock resilience to meteorological fluctuations 3. Increased vulnerability of food self-sufficiency
3	Energy	1. Changes in the gross hydropower potential of rivers 2. Increased critical load on energy infrastructure due to temperature fluctuations 3. Increased vulnerability of energy facilities and infrastructure to hydrological emergency situations (hereinafter – ES)
4	Health	1. Increased morbidity and mortality from non-communicable diseases 2. Increased morbidity and mortality from infectious, vector-borne, and parasitic diseases 3. Damage or destruction of healthcare infrastructure due to climate related events
5	Disaster Risk Management	1. Increased vulnerability of infrastructure and population to hydrological emergencies 2. Increased vulnerability of infrastructure and population to emergencies related to the activation and reactivation of gravitational processes 3. Increased damage from meteorological emergencies to infrastructure and population
6	Forests and Biodiversity	1. Ecosystem degradation and biodiversity loss 2. Shifts in the boundaries and habitats of flora and fauna 3. Increased fire risk and outbreaks of mass forest pest infestations
7	Settlements and Cities	1. Urban “heat islands” 2. Decreased air quality 3. Increased overall territorial vulnerability

The consequences of rising air temperatures are primarily manifested through glacier melting and retreat. Glacier sizes are decreasing rapidly, not only in terms of area but also in thickness. Over the past 50 years, the total glacier area in the Kyrgyz Republic has decreased from 7,944.2 km^2 to 6,683.9 km^2, meaning that whereas glaciers covered 4% of the country’s total area fifty years ago, they now occupy less than 3.3% of the national territory.

Intense glacier melting leads to changes in river basin hydrology, which, in turn, causes a reduction in water availability for both the population and the economy, not only in the Kyrgyz Republic but also in downstream countries along the Naryn and Syr Darya rivers. Climate change reduces the hydropower potential of rivers and increases the vulnerability of energy facilities and infrastructure to hydrological emergencies.

Climate change in Kyrgyzstan also contributes to ecosystem degradation and biodiversity loss, causing shifts in the ranges and habitats of flora and fauna. Additionally, it decreases the productive capacity of pastures and reduces livestock resilience to meteorological fluctuations.

The most urgent problem is that climate change is becoming a factor in increased morbidity and mortality from non-communicable, infectious, vector-borne, and parasitic diseases.

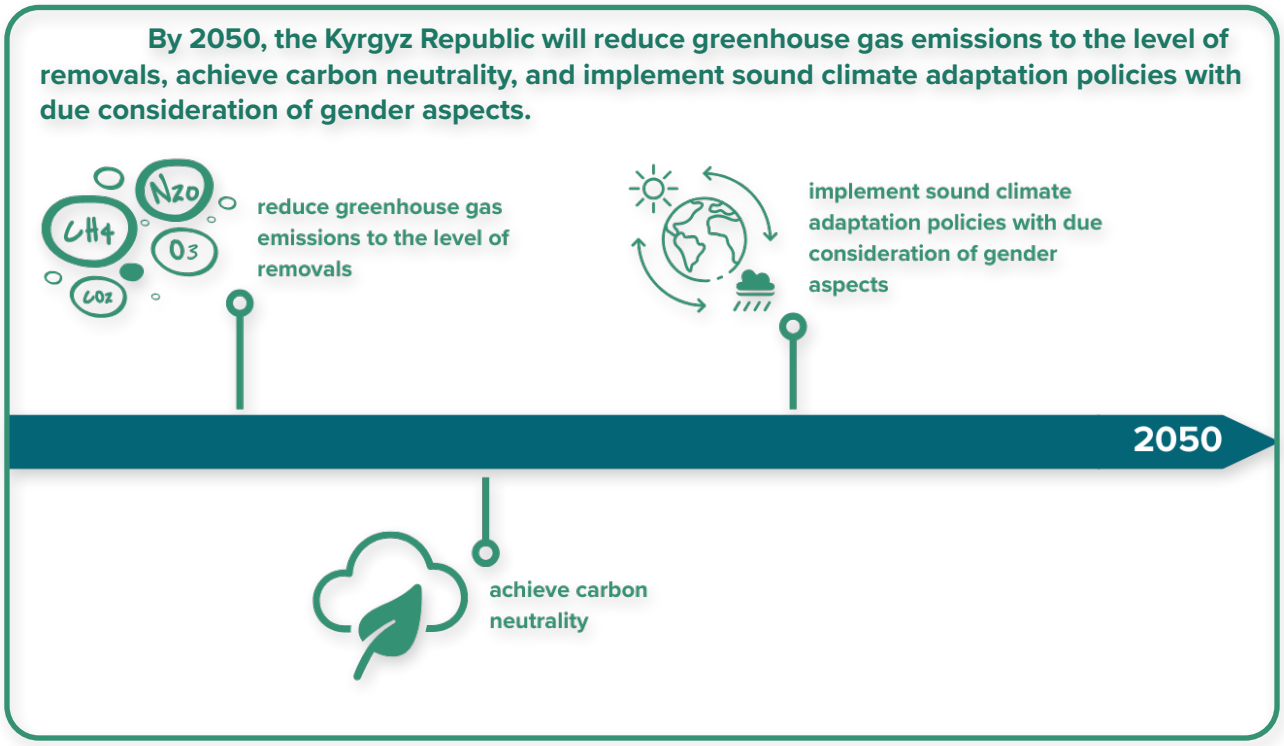
The Kyrgyz Republic spans over four climate zones – the Northwest, Northeast, Southeast, and Inner Tien-Shan zones. The dynamics of mean temperature changes and precipitation trends in these climate zones over past years show different patterns. Long-term forecasts of temperature and precipitation also vary significantly between climatic zones. Weather variability, heat, low water availability, and drought also have different impacts depending on the climate zones. Observation data over several recent years indicate differing rates of crop yield changes across these zones. Accordingly, each of the four climate zones requires a tailored approach to adaptation policy.

CHAPTER 3. MAIN GOALS OF THE CONCEPT

During preliminary discussions with stakeholders and the expert community, and based on the preliminary examination of international experience, the following long-term vision was proposed:

By 2050, the Kyrgyz Republic will become a country with a thriving carbon-neutral economy, moving along the path of sustainable and climate-resilient development, strengthening its competitive advantages, and fostering social unity through actions to combat climate change and its adverse impacts.

To ensure long-term development in line with the above vision, the following goal on reducing greenhouse gas emissions by 2050 was formulated.



CHAPTER 4. PRIORITY AREAS OF MITIGATION POLICY

To achieve the set goal, the Kyrgyz Republic will act in accordance with agreed priorities. The priority areas of mitigation actions are defined by the sources of greenhouse gas emissions and removals and include the following:

- Reduction of greenhouse gas emissions in the Energy sector;
- Reduction of emissions in the Transport sector;
- Reduction of emissions in the Industrial Processes and Product Use sector;
- Reduction of emissions and enhancing the removals in the Agriculture sector;

- Increase of absorption in the Forestry and Other Land Use sectors;
- Reduction of emissions in the Waste sector.

CHAPTER 5. TASKS IN PRIORITY AREAS OF MITIGATION POLICY

Progress in the priority areas will be achieved through addressing corresponding tasks. The formulation of these tasks was based on the analysis of the updated NDC with a planning horizon by 2030. Accordingly, NDC tasks were incorporated into this Concept as tasks that comprise the first implementation phase. However, addressing the NDC tasks alone is insufficient to achieve carbon neutrality, therefore, this Concept also sets new tasks necessary for reaching carbon neutrality by 2050.

In order to solve the tasks outlined in this Concept in the priority areas of mitigation policy specific measures have been identified and presented in the Action Plan.

§ 1. Energy Sector

The most urgent task for the Energy sector is to switch from coal for residential heating to electricity or gas within a realistic timeframe. The following tasks are considered as a priority for the Energy sector:

- Increasing the energy efficiency of buildings and households;
- Reducing coal consumption through switching to natural gas in households and boiler houses;
- Development of renewable energy sources;
- Further development of hydropower;
- Reducing electricity losses in transmission network;
- Reducing electricity losses in distribution network;
- Improving the district heating systems in Bishkek;
- Strengthening the sector's capacity for monitoring and reporting greenhouse gas emissions;
- Raising public awareness on mitigation in the energy sector.

§ 2. Transport Sector

At present, the country has a very large fleet of outdated vehicles emitting high levels of carbon dioxide. The key task in the Transport sector is the transition of public and private vehicles from internal combustion engines to electric transport.

To the following tasks are considered as a priority for the Transport sector in achieving carbon neutrality by 2050:

- Development of electric transport;
- Improvement of traffic management;
- Development of bicycle infrastructure;
- Replacement of buses with internal combustion engines with gas-powered buses;
- Improvement of the overall system for managing public transport and vehicle use;
- Improvement of vehicle operation and fleet management systems.

§ 3. Industrial Processes and Product Use Sector

The following tasks are considered as a priority for the Industrial processes anEd product use sector (hereinafter referred to as IPPU) in achieving carbon neutrality by 2050:

- Development of biogas installations in the food industry;
- Strengthening the accounting of greenhouse gases and equipment containing them;
- Creating conditions for environmentally sustainable management of greenhouse

gases;

- Strengthening the capacity of stakeholders for monitoring and reporting in the IPPU sector;
- Raising public awareness and conducting research on mitigation in the IPPU sector.

§ 4. Agriculture Sector

Improving livestock breed quality remains a highly relevant issue. The problems of soil degradation and declining crop yield also require urgent attention.

The following tasks are considered as a priority for the Agricultural sector in achieving carbon neutrality by 2050:

- Increasing livestock productivity;
- Development of organic farming;
- Introduction of biogas technologies.

§ 5. Waste Sector

The following tasks are considered as a priority for the Waste sector in achieving carbon neutrality by 2050

- introduction of waste sorting at landfills;
- use of the potential of organic waste for biogas production;
- landfill degassing (collection and flaring of biogas);
- strengthening the capacity of the sector and stakeholders in terms of greenhouse gas emissions;
- raising public awareness.

§ 6. Land Use, Land-Use Change, and Forestry Sector

This sector, which is a net carbon removal, the following tasks are considered as a priority increasing the net CO_2 removal in achieving carbon neutrality by 2050:

- Preserving carbon sinks through the conservation of existing forests;
- Increasing carbon sinks through expansion of forest areas;
- Preserving carbon sinks through the conservation of existing perennial plantations;
- Increasing carbon sinks through expansion of perennial plantations;
- Conducting scientific research on climate change mitigation in the LULUCF sector;
- Strengthening the capacity of forestry and educational institutions related to ecology for mitigation in the LULUCF sector;
- Disseminating information on climate change mitigation in the LULUCF sector.

CHAPTER 6. PRIORITY AREAS OF ADAPTATION POLICY

This Concept focuses primarily on measures to mitigate the impacts of climate change, including preventing and reducing greenhouse gas emissions into the atmosphere. At the same time, given the intensifying climate change and its impact in the country (with projected warming of up to 6.0°C), climate adaptation of industrial and infrastructure facilities, population life-support systems and economic functioning, as well as national security (food, economic, epidemiological) becomes particularly important.

The main areas of climate adaptation cover broad areas where the most evident trends with significant threats to life and economic activity are observed, including:

– Human life and material assets. As the frequency and scale of climate-related natural disasters increase, the economic, human, and environmental costs of disaster response and recovery increase as well. Strengthening resilience of the population, infrastructure, and civil and industrial facilities to disasters requires effective governance, cooperation and interaction among all stakeholders, reliable risk information, and tools that help preserve viability.

– Health and well-being of the population. Climate factors play a critical role in shaping public health, with the most vulnerable groups including women, children, the elderly, and persons with disabilities and others. Heat stress, reduced access to safe drinking water and medical care, combined with the synergistic effects of air pollution and adverse weather conditions, require targeted support for local populations in areas of heightened climate vulnerability and for those whose health faces higher climate-related risks.

– Nature and biodiversity. To conserve and ensure the sustainable use of the country's natural wealth in the context of climate change, it is important to promote management approaches that account for current and projected climate impacts on terrestrial and aquatic ecosystems and biodiversity. Integrating carbon-neutrality measures into biodiversity conservation and ecosystem management decisions provides mitigation benefits such as increased carbon removal by ecosystems, while also supporting better climate adaptation of natural systems.

– Development infrastructure is increasingly exposed to climate-related threats particularly water, energy, green, municipal, transport, and other systems that are critical to the daily lives of local communities. At the same time, this sector holds significant potential for enhancing climate resilience and offers substantial opportunities for climate mitigation. A priority analysis of climate risks is required, along with the integration of mitigation and climate risk management factors into the planning, design, operation, and maintenance of networks and facilities.

– Economy and "green" jobs. Climate change directly and indirectly affects the economy, including employment, savings and investment, and trade. The competitiveness of production systems, particularly in international markets, will increasingly depend on the success of their climate adaptation, carbon footprint, and climate efficiency indicators.

Priority areas for adaptation to climate change are defined as follows:

1) Water resources;
2) Agriculture;
3) Energy;
4) Healthcare;
5) Disaster risk management;
6) Forests and biodiversity;
7) Human settlements and cities.

CHAPTER 7. TASKS IN PRIORITY AREAS OF ADAPTATION POLICY

Similarly to mitigation, the identification of tasks in the priority areas of adaptation to global climate change, is based on the analysis of the updated NDC with a planning horizon until 2030.

A list of specific measures aimed at addressing the tasks outlined in this Concept in the priority areas of adaptation policy is presented in the Action Plan. Specific tasks for adaptation in each priority area are outlined below.

§ 1. Water Resources Sector

The following priority tasks have been identified for adaptation in the water sector:

- Conducting scientific research on the impact of climate change on water resources;
- Development of water sector policies that take into account climate adaptation, gender aspects, and the interests of vulnerable groups (NAP);
- Strengthening climate resilience of irrigation infrastructure;
- Strengthening climate resilience of drinking water supply and sanitation infrastructure;
- Promoting efficient use of water resources.

§ 2. Agriculture Sector

The following priority tasks have been identified for adaptation in the agricultural sector:

- Conducting scientific research on the impact of climate change on agriculture;
- Developing of agricultural policies that integrate climate change, gender aspects, and the interests of vulnerable groups (NAP);
- Increasing climate awareness and adaptive knowledge among government officials, local self-governments, and land users;
- Improving land-use practices under climate change;
- Strengthening climate resilience of crop production;
- Strengthening climate resilience of pasture infrastructure;
- Developing climate-resilient livestock breeding;
- Creating climate-oriented financial services and products in agriculture;
- Developing and launching a state program of climate-oriented agricultural support based on the experience of the “Agriculture Finance” program;
- Developing and launching a state program of climate-oriented agricultural support based on the experience of the “Agriculture Finance” program.

§ 3. Energy Sector

The following priority tasks have been identified n the energy sector:

- Conducting scientific research on the impact of climate change on the country’s energy security;
- Developing energy sector policy and legislation taking into account climate change, gender aspects, and the interests of vulnerable groups;
- Raising awareness and knowledge of energy sector employees and the population on climate change issues;
- Increasing resilience of energy infrastructure to overloads during extreme cold events;
- Ensuring the safety of energy infrastructure during climate-related emergencies;
- Diversifying electricity sources in connection with climate impacts on the country’s hydropower;
- Developing mechanisms for organizing, accounting, and monitoring rational use of energy resources.

§ 4. Healthcare Sector

The following priority tasks have been identified for adaptation in the healthcare sector:

- Improving the evidence base in healthcare regarding the impact of climate change on public health;
- Developing health sector policies that take into account climate adaptation, gender aspects, and the interests of vulnerable groups (NAP);
- Improving the clinical regulatory framework for climate adaptation in the healthcare system;
- Increasing climate resilience of healthcare infrastructure;
- Reducing population vulnerability to cardiovascular and respiratory diseases;
- Reducing prevalence of nutrition-related diseases caused by climate change;
- Reducing population vulnerability to food poisoning due to climate change factors;
- Reducing prevalence of infectious, parasitic, and vector-borne diseases;
- Reducing population vulnerability to injuries caused by adverse weather conditions.

§ 5. Disaster Risk Reduction Sector

The following priority tasks have been identified for adaptation in the disaster risk reduction sector:

- Providing scientific justification for decision-making processes on responding to and preventing hydrometeorological emergencies;
- Improving policies for preventing and responding to climate-related emergencies, considering gender aspects and the interests of vulnerable groups (NAP);
- Raising awareness and knowledge in the field of climate-related emergencies;
- Upgrading hydrological and glaciological monitoring systems;
- Expanding agro- and meteorological services;
- Strengthening systems for responding to and preventing climate-related emergencies;
- Developing a Common System for comprehensive monitoring and forecasting of emergencies;
- Developing mechanisms to introduce insurance systems for climate disaster risks;
- Reducing the vulnerability of children and staff in schools and preschool institutions to climate change and emergencies.

§ 6. Forests and Biodiversity Sector

The following priority tasks have been identified for adaptation in the forestry and biodiversity sectors:

- Conducting scientific research on the impact of climate change on forests, ecosystems, and biodiversity;
- Integrating climate adaptation and ecosystem conservation into national forest and biodiversity conservation policies (NAP);
- Raising climate awareness and adaptive knowledge among forestry staff and protected area employees;
- Increasing climate resilience of forest ecosystems;
- Strengthening climate resilience of biodiversity;
- Expanding the network of protected areas by including some glaciers;
- Introducing mechanisms to reduce the vulnerability of forest ecosystems and biodiversity to climate change.

§ 7. Climate-Resilient Territories and Green Cities Sector

The following priority tasks have been identified for adaptation in the sector of climate-resilient territories and green cities:

- Conducting scientific research on the impact of climate change on regions, resi-

dents, and the infrastructure of Bishkek and Osh, considering gender aspects and the interests of vulnerable groups;

- Developing methodologies and pilot policies for "green" climate-resilient development of cities and regions, considering gender aspects and the interests of vulnerable groups;
- Developing and improving urban landscape and recreational zones;
- Introducing "green" and ecosystem-based mechanisms for reducing vulnerability of cities and regions.

CHAPTER 8. CROSS-CUTTING AREAS OF LOW-CARBON DEVELOPMENT

Four cross-cutting thematic areas have been identified that promote low-carbon development and effective implementation of mitigation and adaptation measures:

1) Climate knowledge management that aims to promote the establishment and effective functioning of a national climate services system. It includes activities to provide climate information, including knowledge on climate change and variability, climate threats to the economy, households, and population life-support, to increase awareness among a broad range of stakeholders. This is a key condition for building climate risk management capacity, successful adaptation, and mitigation actions. Effective climate services involve generating up-to-date knowledge, including international knowledge and innovative intellectual products, and delivering it to users in a timely manner. All stakeholders must be provided with reliable and timely information for effective decision-making on climate adaptation and reducing negative climate impacts.

2) A specialized approach to climate-neutral territorial planning that aims at creating conditions to ensure the climate resilience of territories, cities, and rural settlements through proper climate-neutral spatial planning. This approach supports efforts to reduce the negative impacts of climate change on people's lives, facilitates climate adaptation, strengthens the capacity for managing climate risks, and enhances the climate resilience of vulnerable population groups. Territorial planning documents, including those related to the location of economic facilities, engineering, transport, and social infrastructure, must address the goal of achieving carbon neutrality. They should incorporate up-to-date measures to reduce climate vulnerability and minimize negative impacts on the climate. Actions in this area will ensure that climate-related issues are integrated into regional socio-economic development documents.

3) The introduction of technological and institutional innovations that aims at promoting the implementation of mitigation and adaptation measures, and the widespread adoption of climate-related "green" innovations in the context of the Kyrgyz Republic to support inclusive and sustainable development. This approach encourages economic actors—primarily the private sector to consistently apply proven inclusive "green" technologies, methods, and practices for achieving carbon neutrality. It also fosters a transition toward the planning, design, construction, and operation of economic systems that are resilient and competitive under changing climate conditions. Implementing measures in this direction will enhance the environmental and economic competitiveness of economic actors, especially small and medium-sized enterprises, through the application of modern climate adaptation and mitigation technologies. It will also strengthen the capacity of government bodies and local self-government authorities to make effective decisions in managing climate risks.

4) Investment financing and insurance that aim at ensuring the funding of multilateral investments and the effective insurance of climate risks to minimize losses and damages through the implementation of measures for reducing greenhouse gas emissions and adapting to the adverse effects of climate change (including climate risk management). One of the key outcomes is the provision of necessary financial resources to build capacity and reduce losses and damage, while ensuring the continuity of public and private services and effective insurance against the negative consequences of climate change.

CHAPTER 9. EXPECTED RESULTS OF THE IMPLEMENTATION OF THE CONCEPT

Overall, the implementation of this Concept is expected to deliver the following results:

- Minimize climate risks for the population and economy of the Kyrgyz Republic, and reduce climate change;
- Ensure the fulfillment of the Kyrgyz Republic's international commitments in the area of consistent transition to low-carbon development;
- Integrate the climate agenda into the socio-economic development of the Kyrgyz Republic, ensuring the country's climate security;
- Enable transition to an innovative development path – a low-carbon, inclusive "green" economy in the interests of sustainable development of the Kyrgyz Republic;
- Create favorable regulatory, legal, and economic conditions to support climate-friendly innovations, including the protection of intellectual property rights and other results of scientific and technological activities;
- Implement mechanisms for consolidated and multi-channel financing of the most significant climate adaptation and mitigation projects, using budgets at all levels, as well as extra-budgetary sources and international support funds;
- Develop low-carbon areas and enhance their investment attractiveness.

CHAPTER 10. FAVORABLE PRECONDITIONS AND RISKS

The implementation of this Concept is a complex and long-term process that will affect many areas of economic development and public life. Its successful implementation depends on many factors related both to the external context of the Kyrgyz Republic's and to the efforts at the national level.

§ 1. Key Favorable Preconditions

The keys to implement the Concept are outlined here.

1) International context: At the international level, it has been recognized that sustainable development, climate change adaptation, and greenhouse gas mitigation are inextricably linked, creating the potential for synergy, trade-offs and co-benefits. For developing countries that are exposed to significant climate threats, adaptation issues come to the forefront;

2) Awareness of the urgency of climate action and the institutional readiness of the Kyrgyz Republic to transition to low-carbon development: The Kyrgyz Republic declared its intention to achieve carbon neutrality by 2050 at the World Leaders' Summit in Glasgow on November 2, 2021., within the UNFCCC framework. To achieve this goal, Kyrgyzstan already has the necessary long-term strategic legislative frameworks for the climate agenda, regulated by programmatic documents at various levels – from national to sectoral;

3) Availability of national organizational structures (with corresponding authority) to implement the transition to climate-neutral development:

–to consolidate coordination efforts in the areas of climate change and the "green" economy, the Coordinating Council on Climate Change, Ecology and Sustainable Development is functioning. The Ministry of Natural Resources, Ecology and Technical Supervision of the Kyrgyz Republic has been tasked with developing and implementing a unified state policy in the climate sphere. Consistent and systematic work is being carried out to analyze and clarify the competencies of public administration bodies, engage the private sector, non-governmental organizations, academia, and business associations in making and implementing decisions on various aspects of national climate policy;

4) Recognition by a significant part of the Kyrgyz population and the broader public of the vital necessity of adapting to climate change: Current practice demonstrates many examples of climate initiatives at the level of local communities, NGOs, and environmental move-

ments aimed at contributing to sustainable development and raising awareness of climate change issues and its specific impacts on Kyrgyzstan;

5) Significant progress in the national mitigation process and on-going work on climate adaptation: Although the Kyrgyz Republic has relatively low greenhouse gas emissions, it remains an active participant in the global process of reducing negative climate impacts. Assessment of emissions and removals of greenhouse gases is carried out in the framework of regular reporting under the UNFCCC. Since 2003, four National Communications have been prepared, containing data on emission inventories and removals, analysis of adaptation and mitigation measures, and GHG emission projections. The country is actively developing its NAP;

6) Availability of specialized international technical, financial, and analytical assistance: in practice, Kyrgyzstan has been actively implementing numerous long-term international project initiatives aimed at supporting national efforts to fulfill international climate commitments (sectoral international projects on mitigation and adaptation, establishment of general frameworks for monitoring and policy development, improvement of climate statistics collection, research and analytical work, and comprehensive capacity building of government officials, etc.);

7) Overall readiness of the local expert community to work towards achieving carbon neutrality: Over the years of independence, a professionally trained, active, and responsible expert community has been formed in the Kyrgyz Republic. Local experts and consultants carry out a wide range of activities to support the achievement of strategic goals in the transition to climate-neutral development.

§ 2. Risks

The most significant risks in implementing the Concept are outlined here.

- Institutional risks: certain issues of the climate agenda and climate adaptation, despite their comprehensive and cross-cutting nature, are still not integrated into sectoral regulatory legal acts governing the activities of a number of ministries, agencies, and their structural divisions. In the absence of such a "systemic climate mandate," cross-cutting management decisions at different levels and in different sectors are often made not in a systematic manner, but rather through manual management and ad hoc responses;
- Lack of a system for recording and assessing damages from the negative impacts of climate change in various sectors, infrastructure, life-support systems, and households: Progress towards climate-neutral development in the Kyrgyz Republic is significantly hampered by the absence of a nationally adopted comprehensive approach to assessing the degree of climate risk impacts, based on contemporary methods and best practices, while taking into account the country's socio-economic and natural-climatic characteristics. Monitoring of climate risks consequences is necessary. Without such data, it is impossible to assess many economic dimensions of climate responses, such as the expected amount of climate adaptation assistance, compensation payments, recovery costs, etc.;
- Likelihood of insufficient financing for adaptation and mitigation measures.

CHAPTER 11. STAGES OF IMPLEMENTATION AND FINANCING

This Concept is expected to be implemented in two stages.

§ 1. First Stage, until 2030

This stage envisions the identification and development of underlying elements of the implementation system of the Concept, including the development of institutional (regulatory legal) and organizational infrastructure, as well as the promotion of the most significant "green" climate-friendly and adaptation innovations. Underlying regulation and legislation will be developed and adopted, establishing commitment to the climate agenda.

§ 2. Second Stage, 2030–2050

This stage envisions putting in place effective management of actions aimed at the transition to a low-carbon, inclusive "green" economy in the interests of sustainable development. This will require establishing appropriate inter-country and inter-agency coordination, as well as setting up an effective system of incentives for the implementation of mitigation and adaptation measures, especially those that are mutually supportive.

The implementation of this Concept will be carried out within the funds allocated in the state budget for the corresponding years, as well as through extra-budgetary sources, international assistance, and private investment.

CHAPTER 12. IMPLEMENTATION MECHANISMS

§ 1. Coordination of Implementation

The coordination of the implementation of this Concept of Carbon Neutrality in the short term will be carried out within the existing institutional framework under the overall interagency coordination of the Coordinating Council on Climate Change, Ecology and Sustainable Development . The state body responsible for the UNFCCC – the Ministry of Natural Resources, Ecology and Technical Supervision of the Kyrgyz Republic – will also monitor and track the progress of implementation of the measures and tasks of this Concept and collect relevant information.

The most important overarching tasks in the implementation of this Concept are:

- Periodic clarification and forecasting of national priorities under this Concept;
- Increasing demand for national science-intensive innovative products (goods and services) with climate- and nature-conserving orientation, and developing and activating the corresponding markets for goods and services;
- Stimulating climate-friendly initiatives and entrepreneurship, with active involvement of small and medium-sized enterprises, and coverage of farming and household sectors;
- Promoting the development of intellectual property and intellectual activity outcomes in the implementation of this Concept;
- Focusing resources and consolidation of efforts of the state and other economic actors on the most important directions of national climate policy;
- Strengthening and harmonizing links among economic actors, regardless of their legal and ownership forms, in the implementation of complex climate adaptation and mitigation tasks;
- Developing a system for training and retraining personnel for the purposes of the implementation of this concept – starting from preschool education to higher education institutions.
- As the tasks of the first stage are addressed and the tasks of the second stage are further clarified, the implementation of this Concept will be promptly adjusted as needed.

§ 2. Monitoring and Evaluation

The main indicator of mitigation actions is the level of achieved reductions of greenhouse gases emissions measures in tons of CO_2 equivalent. In addition, a wide range of sectoral indicators will be used. These indicators are included in the Action Plan, which is based on the Updated NDC submitted by Kyrgyzstan to the international community in 2021, are used for its calculation.

These indicators represent a set of benchmarks for assessing the results for each relevant measure. Assessment of these indicators, collecting and processing relevant data and information, and compiling it into reports is the responsibility of the relevant bodies designated in the Action Plan, with due consideration of gender aspects.

Gender-sensitive measures are cross-cutting and present in all sectoral measures. These measures enable accounting for gender representation at the level of decision-making and resource allocation. They require gender considerations in research, monitoring, and evaluation, as well as in the preparation of informational and communication products, program

development (including educational programs). They also require undertaking broad public awareness activities involving not only men and women, but also underrepresented vulnerable groups, such as persons with disabilities, youth, etc.

Responsibility for implementing measures under the Action Plan is assigned to the relevant institutions of the state, municipal, and private sectors, as well as academia and civil society.

To improve the effectiveness of the monitoring process, appropriate formats of reporting at the national levels will be introduced, and collecting data into the overall reporting on this Concept's implementation will be regulated.

An important element of the monitoring system will be the preparation of reports within the framework of the national greenhouse gas inventory for the purposes of international climate reporting under the UNFCCC. The results of the national greenhouse gas inventory are based on quantitative assessments of greenhouse gases by sectors, which makes this information one of the key inputs for evaluating the effectiveness of mitigation and adaptation measures and contributes to the timely adjustment of climate policy.

LIST OF ABBREVIATIONS

CCCEDS	Coordinating Council on Climate Change, Ecology and Sustainable Development under the Cabinet of Ministers of the Kyrgyz Republic
LULUCF	Land Use, Land-Use Change and Forestry
IPCC	Intergovernmental Panel on Climate Change
MRV	Monitoring, Reporting and Verification
NAP	National Adaptation Plan
LSGB	Local Self-Government Bodies
NDC	Nationally Determined Contribution
UN	United Nations
PAs	Protected Areas
IPPU	Industrial Processes and Product Use
UNFCCC	United Nations Framework Convention on Climate Change
CMIP6	Coupled Model Intercomparison Project Phase 6

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