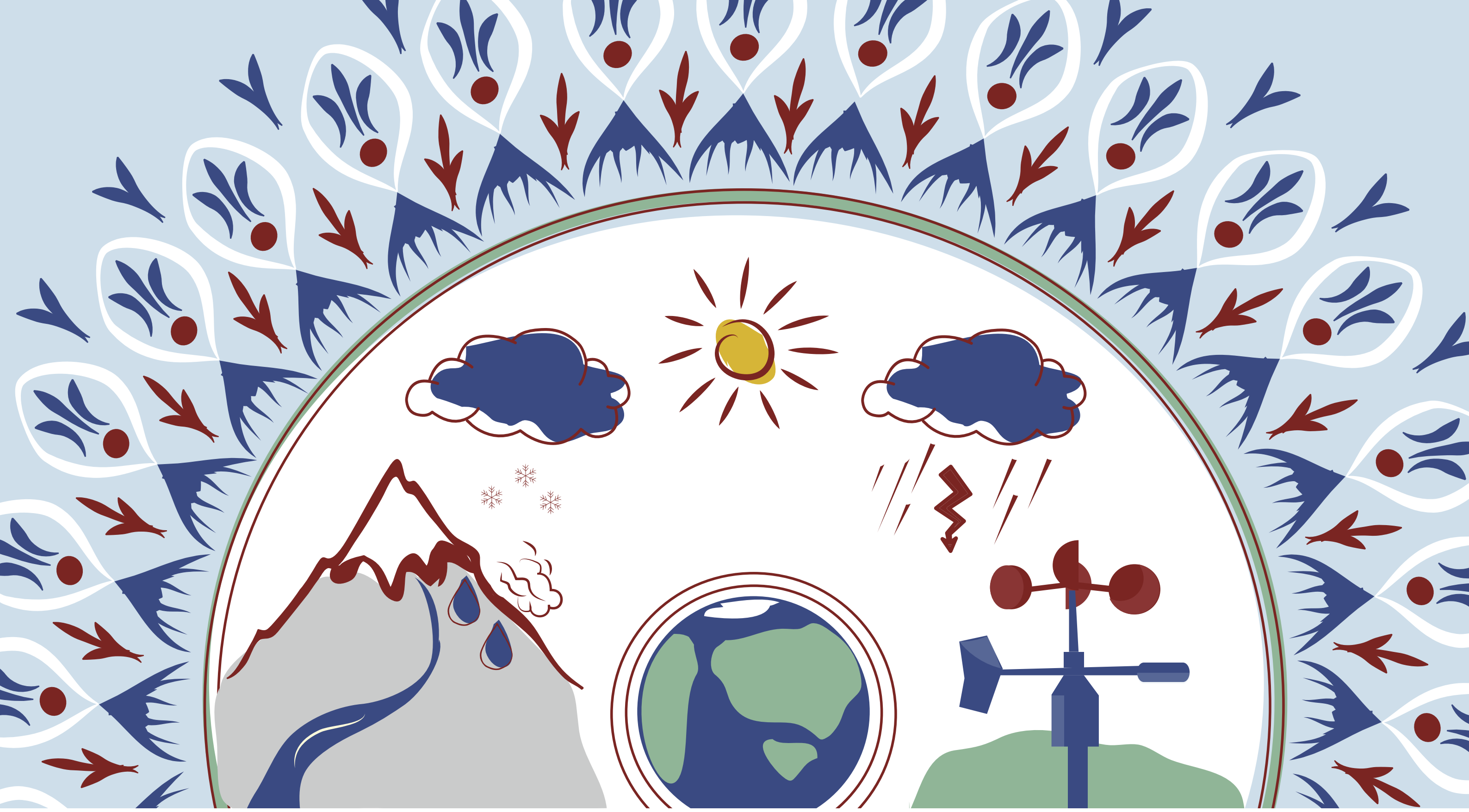

Climate change in Central Asia
Illustrated summary

Climate change in Central Asia. Illustrated Summary.

Acknowledgement

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Produced by Zoï Environment Network

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1. Introduction

Over the past decade, the five countries of Central Asia — Kazakhstan, the Kyrgyz Republic, Tajikistan, Turkmenistan and Uzbekistan — have made good progress on integrating climate change considerations into sectoral planning, and in developing solutions from the household to the sector level. All the countries submitted their nationally determined contributions to the global climate action under the Paris Agreement, and are revising their climate targets for 2020–2021.

Two of the five countries — Kyrgyzstan and Tajikistan — have managed to keep their greenhouse gas emissions below their peak levels, but total emissions are projected to grow even though the countries are working to decouple emissions and economic growth. In 2018 GHG emissions in Kazakhstan approached the country's 1990, Uzbekistan's emissions were fluctuating around the year 1990 level with some recent increases, and Turkmenistan's emissions have been rising since 2000.

In a major shift from political and institutional interest in climate issues residing primarily in environmental agencies and hydrometeorological services, the ministries of finance, energy, the economy and foreign affairs are new and strong players in planning and implementing climate actions and the transition to cleaner energy. The environmental agencies and hydrometeorological services remain strong players, but the number of stakeholders has grown, and academia and NGOs are actively engaged. Presidential and other high-level statements increasingly cover climate change and related concerns.

Climate change in the region is likely to continue disrupting precipitation, increasing temperatures and altering the mountain glaciers and snow reserves. Both mountain and downstream communities will face challenges related to water resources and increased risks from natural hazards. The implications of warming spill across a range of concerns.

The effective implementation of the 2015 Paris Agreement to limit the global temperature rise to well below 2.0°C above pre-industrial levels depends on the domestic and international climate actions by multiple stakeholders, and 2020 is a critical year for the countries around the world to start fulfilling the promise of the Paris Agreement in concert with addressing the Sustainable Development Goals. In its 2020 World Energy Outlook, the International Energy Agency stresses two themes — the effects of the pandemic and the opportunities for accelerating the transition to clean energy. Other global developments of interest in Central Asia include the European Union's Green Deal and China's pledge to have its emissions peak in 2030 and to reach carbon neutrality by 2060. Both the EU and China are important to Central Asia as investors in energy technologies and infrastructure, and as trade and strategic partners.

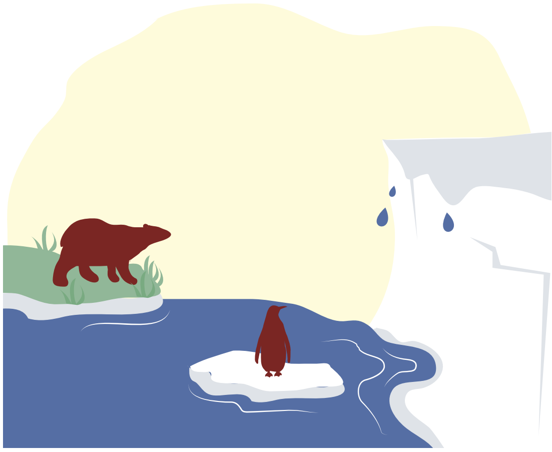
In Central Asia, the decline in economic activity in 2020 resulting from the global pandemic came with a decline in greenhouse gas emissions, but also with serious socioeconomic disruptions. Travel restrictions affected labour migration — a key income source in the region — and led to the postponement of the 26th Conference of the Parties of the United Nations Framework Convention on Climate Change (UNFCCC). Economies around the world suffered setbacks and unemployment rose almost everywhere. Internal and international political conflicts and violence have popped up in many regions. When oil storage capacity ran low, oil producers started paying "buyers" to take the product so that the producers did not run out of storage. The resulting negative oil price — previously unthinkable in the oil and gas exporting economies in the region — did not make its way to consumers, however, and the oil sector suffered economic losses. In short, 2020 has been a strange and challenging year.

For the first time in Central Asia, the regional Climate Adaptation and Mitigation Program for the Aral Sea Basin (CAMP4ASB) is supporting countries in their domestic climate change responses. The CAMP4ASB activities include mobilizing NGOs, academia, parliamentarians and hydrometeorological services to identify and address climate change challenges; holding regional climate forums; demonstrating climate adaptation and clean energy technologies; and encouraging the mass media to cover climate issues. The countries initiated CAMP4ASB in 2015 under the auspices of the Executive Committee of the International Fund for Saving the Aral Sea (IFAS). The World Bank provides US $38 million in funding with additional financing from the Green Climate Fund (GCF).

In implementing this project, the Regional Environmental Centre for Central Asia (CAREC) engaged numerous partners in Central Asia and internationally. Selected results — including data from scientific assessments and climate adaptation actions — are reported here, and more detailed information is available from the CAREC website and Central Asia Climate Information Portal, designed for regional information exchange and links to the global knowledge. The report team hopes that readers will find information in this report relevant and that the visuals will be used broadly for education and for raising awareness.

This publication provides visual information on current global and regional climate change impacts and areas of concerns, reports on greenhouse gas emission sources and trends, and presents the regional and country efforts to transition to clean energy. The information sources include official country information from the national communications to the UNFCCC, other international and domestic information such as statistics and news reports, and scientific papers. These data sources vary in terms of methodology, reference years and completeness, and the combination of international and domestic sources gives readers a regional summary that uses information as diverse and comparable as possible. Information reported by the countries is available on the UNFCCC and country websites, but regional reporting is harder to find.

Global climate headlines and concerns



Record warm temperatures in the polar regions

In 2020 record-breaking temperatures in the polar regions peaked with the all-time warmest February on record in Antarctica at +18 °C, while the sea ice extent in the Arctic was the second lowest since satellite observations began. In June, temperatures in Verkhoyansk — a Russian town located within the Arctic circle — reached +38 °C amid a prolonged Siberian heatwave. The thawing permafrost around Norilsk, a major industrial city in the Arctic, was a contributing factors in the collapse of a power plant's fuel tank support, leading Russia to declare a state of emergency with more than 20 000 tonnes of diesel leaking into the river and heading toward the ocean. The damage of this leak is estimated at US $2 billion.

Record winter and summer temperatures, heat and extensive forest fires in 2019

In December 2019, Australia witnessed its most intense and destructive forest fires ever, and in summer 2020, massive wildfires swept across Siberia, Alaska and the Western United States as a result of climate change effects. Asia and Europe saw record high temperatures, with the warmest February in recent history.

Growing damage from natural disasters

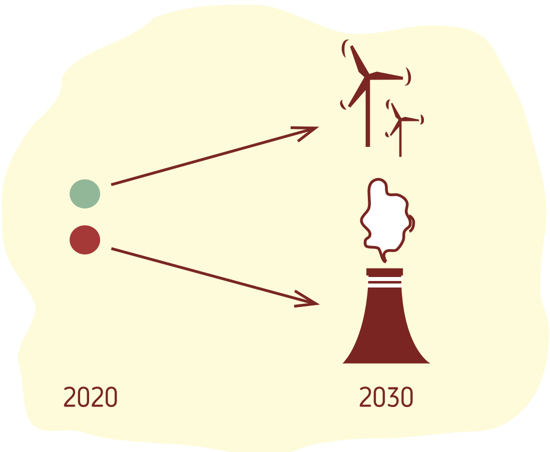
Weather-related natural disasters have become more frequent and more severe globally. In April 2020, more than 140 tornadoes hit the United States, affecting more than 1 million homes. The July 2020 hurricanes in the Caribbean and southern United States came much earlier and were more numerous than usual due to warming of the ocean. Extreme rainfall events in Bangladesh the same month were devastating, affecting 4.7 million people, and raising growing concerns for future disasters.

Existential risk to small island states

Small island developing states are increasingly threatened by the impacts of climate change. Major risks include sea level rise, storm surges, and coastal devastation that could wipe out islands entirely. Even mild impacts will threaten their economies, livelihoods, and overall food security.

Risk multiplier for conflict and migration

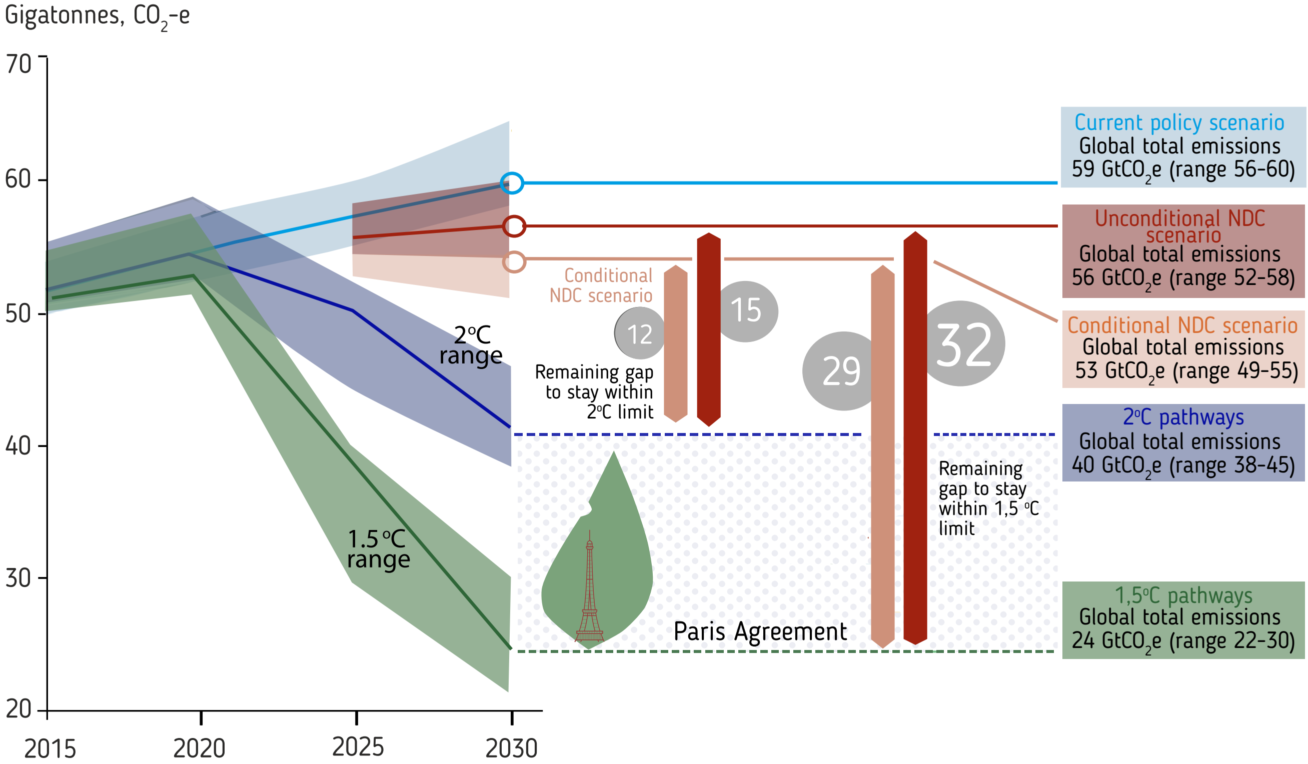
In areas experiencing conflict, climate change is likely to exacerbate the tensions, and in some situations may lead to increased migration. As heightened water scarcity, more frequent droughts and crop failures lead to economic deterioration, areas with limited resources may see increased conflict and mass migration to urban areas as people flee degrading conditions.



Global climate actions and targets

Implementation of the Paris Agreement on climate change begins in 2020, and countries are resubmitting their nationally determined contributions with more ambitious climate targets. At the same time recent drops in emissions due to COVID-19 and rethinking of energy and investment policies may contribute to the success of Agreement. Due to the global pandemic, annual climate change negotiations have been postponed for at least one year, providing additional time for the countries to refine their targets and priorities.

Global greenhouse gas emissions under different scenarios and the emissions gap in 2030



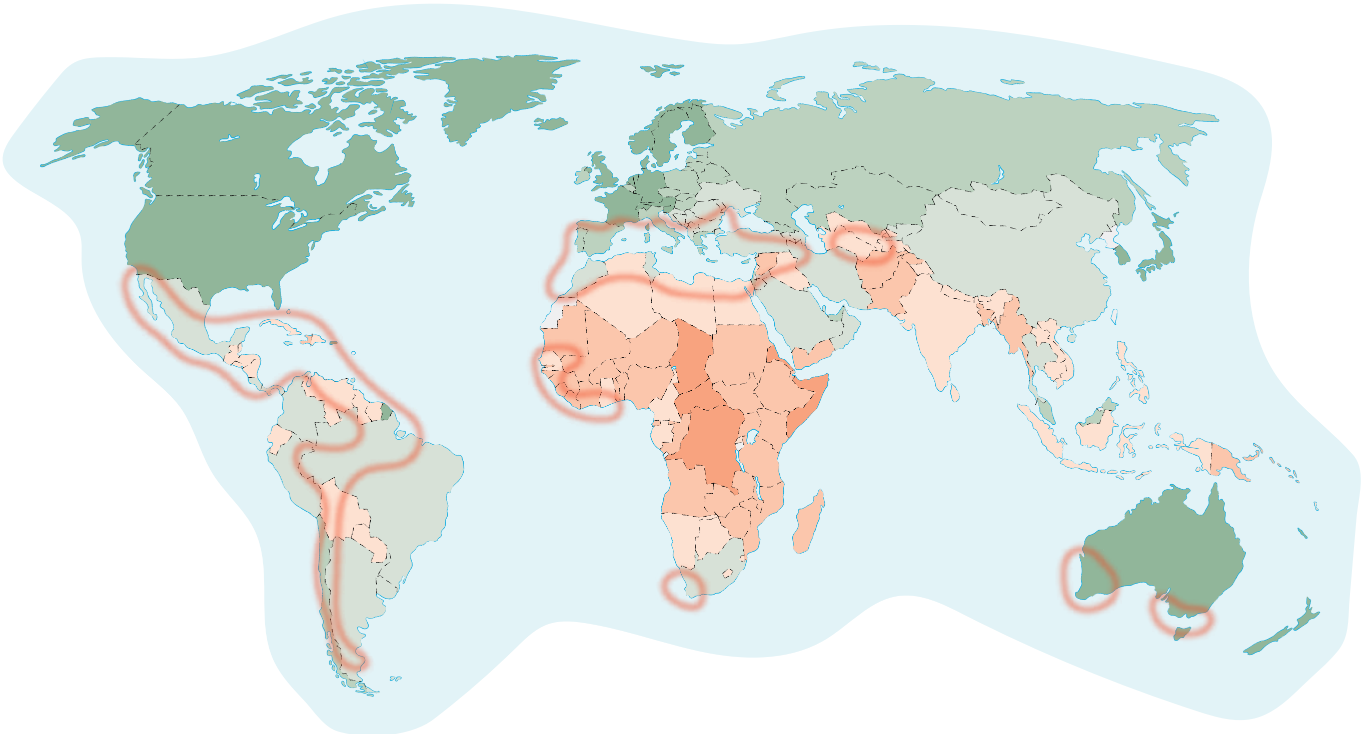
In 2015, the UNFCCC Conference of the Parties in Paris, France, agreed on the easily understood and vital target of keeping the global temperature rise to well below 2.0 °C above pre-industrial levels, and called for efforts to limit the temperature increase to 1.5 °C. The Parties to the Paris Agreement, including all the states of Central Asia, made nationally determined contributions (NDCs) specifying the emission reductions they intended to achieve, and reported on other national needs, such as adaptation priorities. Most Parties have submitted conditional and unconditional NDCs. Conditional measures are often linked with external support in the forms of technology transfer or financing.

How the countries' actual emissions are affecting the global emission projections compared to the reductions necessary to keep below the 2.0 °C and the 1.5 °C targets is known as the emissions gap, and is the subject of annual assessments conducted by the United Nations Environment Programme (UNEP).

According to the 2019 Emissions Gap Report, the consistent implementation of the unconditional NDCs submitted in the 2015–2017 period would result in a global average temperature increase of about 3.2 °C above pre-industrial levels by 2100, and temperatures would continue to rise. The implementation of the conditional NDCs would still result in a temperature increase of 3.0 °C — well above of the Paris Agreement targets. Scientists and analysts report that a rapid reduction in GHG emissions in the decade of 2020–2030, with a much greater level of effort than the current NDCs, is required.

Limiting warming to 1.5 °C will require reductions in emissions to net zero by 2050. Pathways to reach the 2 °C goal call for about a 25 per cent reduction to 2030, and reach net zero by about 2070. The Paris Agreement climate targets would require unprecedented transitions in energy, land, urban and infrastructure and industrial systems in terms of scale, and deep reductions of emissions in all sectors.

Vulnerability to climate change



Resilience and vulnerability to climate change

ND-GAIN Country Index summarizing a country's current vulnerability to climate change and other global challenges in combination with its readiness to improve resilience

worse better

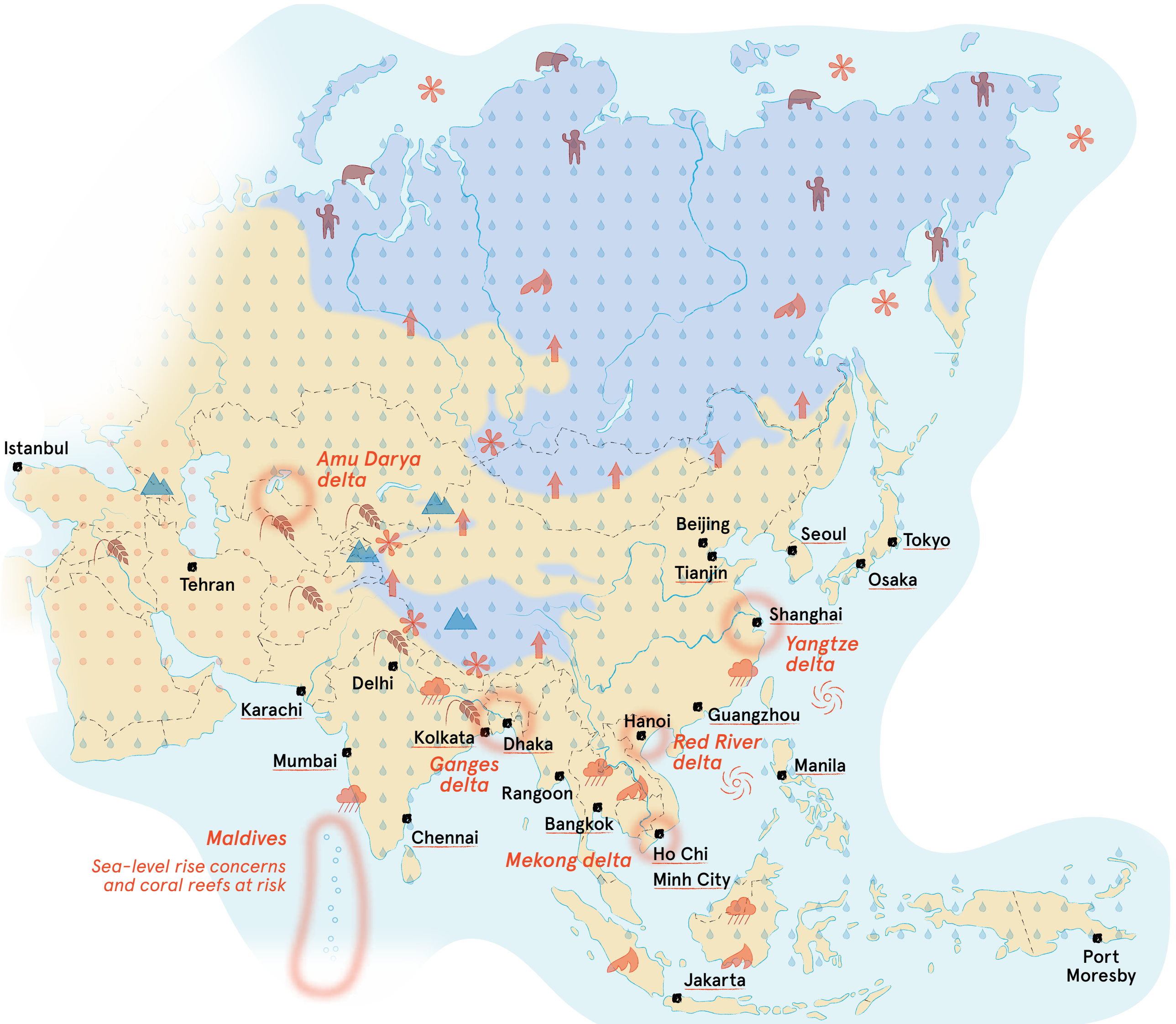
Occurence of days under drought conditions by the end of the 21st century

More than 40%

Source: University of Notre Dame, data from 2017 (simplified); Prudhomme et al. 2013
Map produced by ZOÏ Environment Network, April 2020

Academic researchers and international development organizations such as the World Bank use the Notre Dame Global Adaptation Initiative (ND-GAIN) Country Index to evaluate and understand the conditions for climate-related investments. The ND-GAIN analysis of vulnerability considers a country's biophysical exposure to climate change, the proportion of the population particularly susceptible, the extent of dependence on economic sectors particularly sensitive to climate hazards, and the adaptive capacity of the affected sectors.

The analysis of readiness considers the ability of the business community to use investments to reduce sensitivity or increase adaptive capacity, governance and institutional capacity, and social factors such as education, inequality and information and communication infrastructure. Many of the most vulnerable countries are in Africa, but with a growing risk of droughts and a decrease in precipitation, the southern countries of Central Asia are also highly vulnerable.



Climate change in Asia

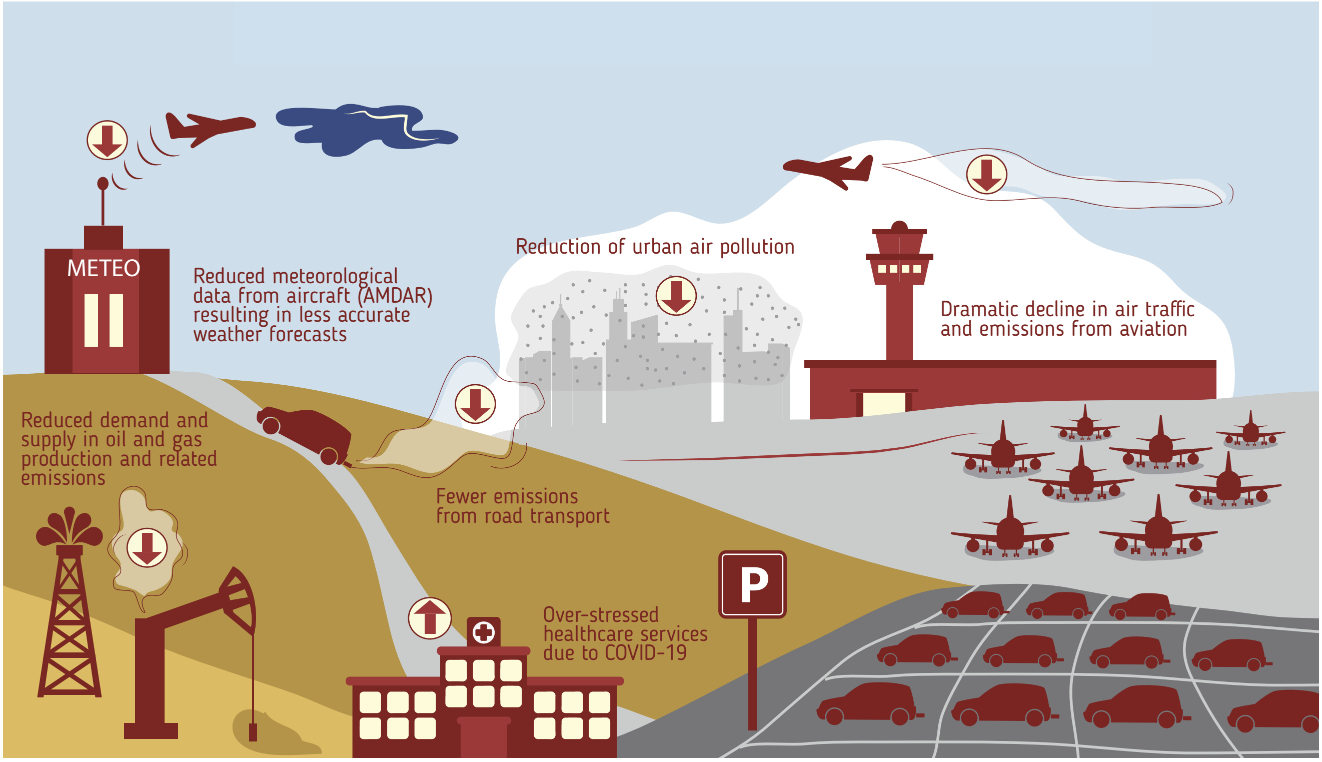
- Climate change hotspot
- More precipitation
- Less precipitation
- Negative agricultural changes
- Changes in the arctic environment
- Shift of the permafrost border to the north
- Melting of glaciers and sea ice
- Impact on mountain regions
- Increasing frequency of forest fires
- Vulnerable indigenous communities
- Increasing monsoonal precipitation extremes
- Increasing frequency or intensity of cyclones (uncertain)
- Seoul — Sea-level rise concerns and affected major cities

The severity of the widespread climate change impacts in Asia varies according to each country's characteristics. Higher temperatures and changing weather patterns will yield massive risks of food insecurity — already a major challenge across the continent. Coastal countries are at risk of deadlier natural disasters and sea level rise, and river deltas, island nations and coastal mega cities are particularly at risk. Sparsely populated areas such as Siberia have few people at risk, but the infrastructure there is highly vulnerable, and densely populated areas such as India and parts of China can expect high impacts on health from air pollution and heatwaves, and on food security.

Severe weather events in Central Asia in 2020

Strong winds and rains in spring 2020 brought significant damage to agriculture and private property in the southern parts of Uzbekistan and Turkmenistan, and contributed to the failure of the poorly constructed Sardoba Dam in Uzbekistan, leading to flooding of the downstream areas along the Syr Darya. Flash floods — the most common and deadly type of a natural hazard in Tajikistan — affected roads and several villages. High summer temperatures in Dushanbe and Tashkent added to the health stress caused by the pandemic. In southern Kyrgyzstan, walnut forests suffered frost damage in spring and their yield was much lower than the local population reliant on forest products had hoped for.

Impacts of global pandemic and COVID-19 restrictions on climate

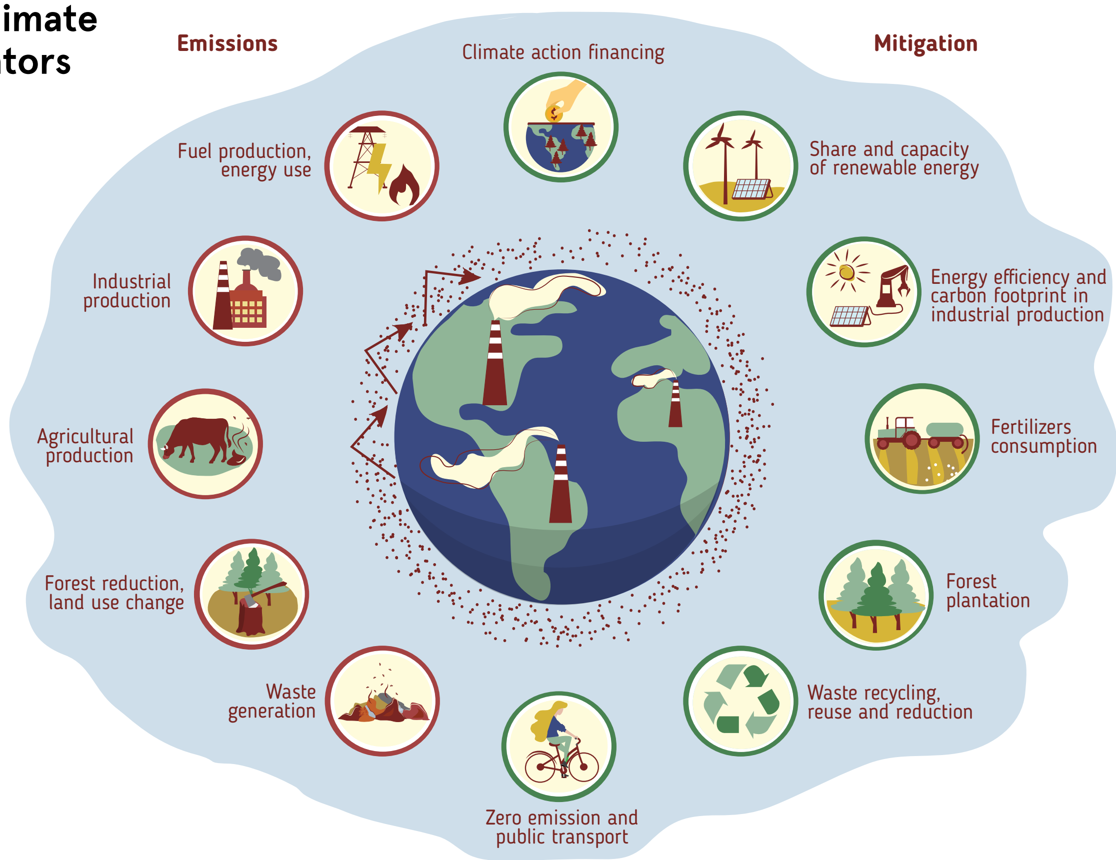


The reductions in travel and other economic activities caused by the COVID-19 shutdowns led to a more than 5 per cent reduction in global emissions in the first quarter of 2020 compared to the first quarter of 2019. By the end of the year emissions are projected to reach a level 8 per cent lower than 2019 levels — the largest annual reduction in emissions ever and the lowest annual emissions since 2010. To put these reductions in perspective, remaining on track to meet the 1.5 °C temperature goal set in the Paris Agreement requires an emissions decline of 7.6 per cent per year every year between 2020 and 2030.

Central Asia's emissions are no doubt falling as a consequence of the drop in economic activity. As of summer 2020, Tajikistan and Turkmenistan were less affected than the other Central Asia countries and had not introduced nationwide lockdowns and so may not experience significant emission reductions. With the significant reduction in flights, numerical weather forecasting faced a shortage of high-altitude weather data reported by aircraft. In addition, the pandemic affected employees of national hydrometeorological services and consequently affected weather forecasting. On a positive note, air quality in many cities improved, at least temporarily, and demand for fossil fuels dropped.

2. Measuring and reporting on climate change

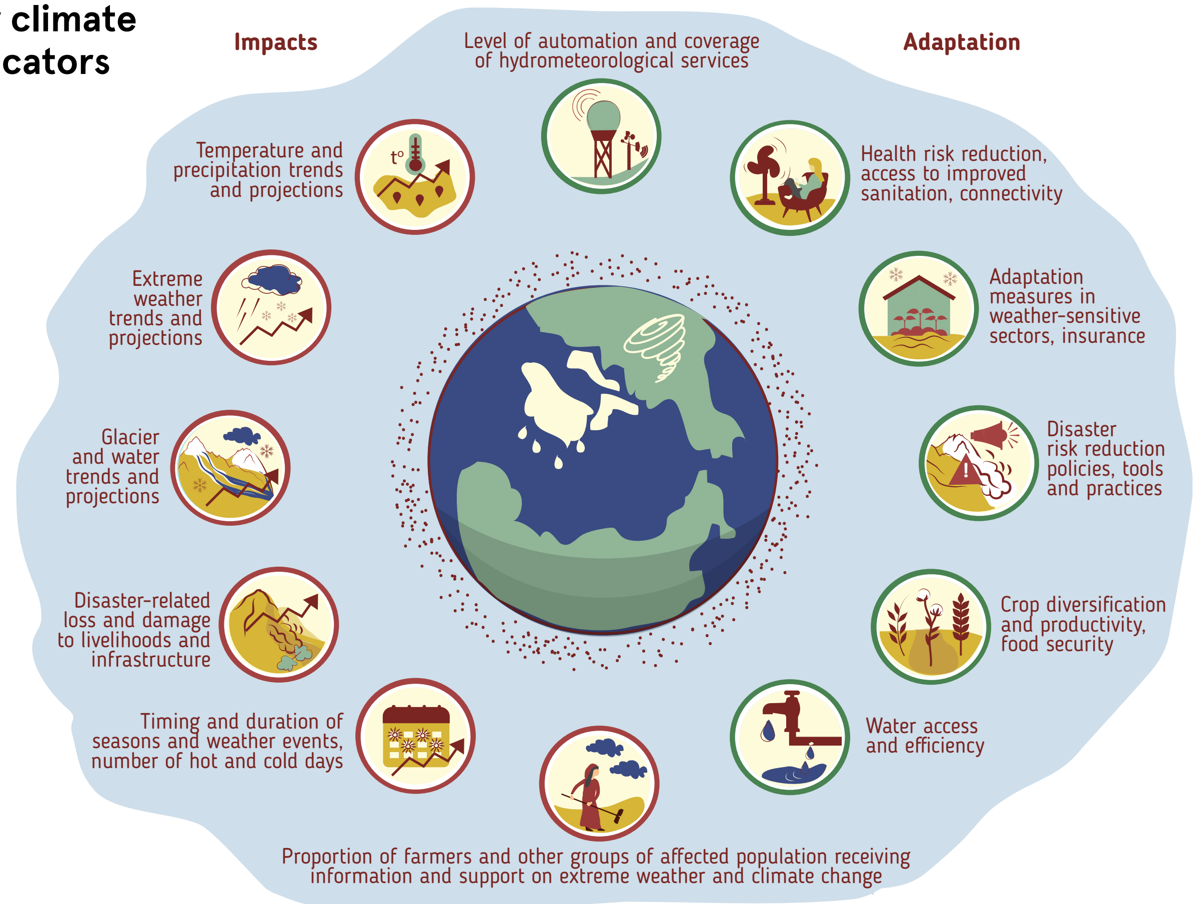
Key climate indicators



Global warming is linked to greenhouse gases (GHGs) such as carbon dioxide, methane, nitrous oxide and others. Different GHGs have different lengths of time they persist in the atmosphere and different levels of warming associated with them. To make a single measurement for all GHGs, scientists convert all values to the equivalent of carbon dioxide, which is the most prevalent, and use the term "carbon dioxide equivalent" or CO_2-eq. As GHG emissions have risen over time, global temperatures have increased — a relationship at the heart of climate change.

Opportunities for reducing emissions are available across the economic sectors — energy, transport, agriculture, housing, industry, forestry and waste. Alternative technologies and renewable resources such as wind and solar energy offer prospects for significant progress, but despite the best intentions, emissions have continued to increase both globally and in Central Asia.

Key climate indicators



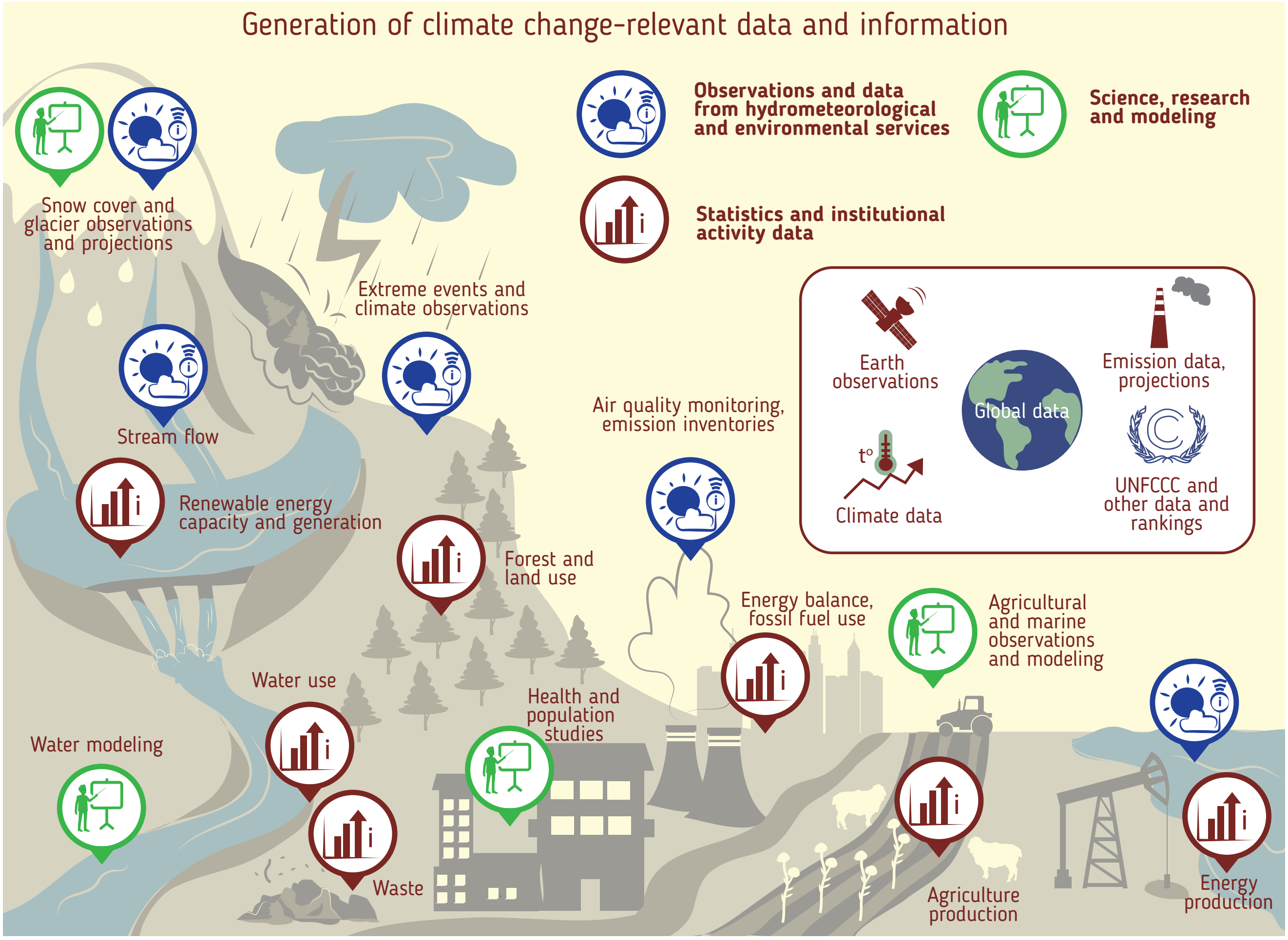
Temperatures at the Earth's surface, in the atmosphere and in the oceans are all increasing. In Central Asia, the increase in temperatures exceeds the global average. Precipitation patterns are changing in uneven ways — some wet areas are getting wetter and some dry areas are getting drier, but no uniform pattern is evident either globally or regionally. Snowfall is becoming rainfall. The amount of water vapour in the air is increasing, and in turn extreme weather events are becoming more frequent and more extreme. Glaciers are retreating and losing mass. Sea levels are rising and the extent of sea ice is shrinking. The oceans are becoming more acidic, and coral reefs are dying. Flora and fauna are migrating to higher latitudes and elevations. Growing seasons are lengthening, but record high temperatures, more hot nights and longer and more intense droughts are adversely affecting agriculture.

Adaptation strategies intend to prevent or minimize the adverse effects of climate change, and include such measures as developing drought-tolerant crops, providing thermal protection for livestock, reducing waste, adapting building codes to account for future weather conditions and extreme events, providing cooling centres for urban dwellers during heatwaves, and creating land corridors for migrating animals. Banks and micro-finance organizations offer financing for adaptation and mitigation projects.

National and international sources of information

All of the Central Asia national hydrometeorological services provide information and services related to climate, weather and hydrology. Periodic national communications to the United Nations Framework Convention on Climate Change provide official information. The national communications usually include a description of national circumstances, a summary and important details of the national greenhouse gas inventory, emission trends and projections, vulnerability assessments, adaptation and mitigation actions and outlooks. But readers may find many differences in data reported by the countries and data from international organizations. These differences occur due to methodological approaches, the level of detail and national nuances.

Ten years ago Kazakhstan reported to the UNFCCC as a Non-Annex I country, but then its reporting frequency and level of detail changed. Now it reports at higher frequency, follows stricter rules and faces in-depth reviews. Kazakhstan also publishes climate indicators in its national statistics. Other countries of Central Asia are now reporting so-called biannual update reports (BURs) in addition to their national communications. Readers may reasonably infer from this title that reporting occurs every two years, but practical matters intrude. BURs are time-consuming to produce and to date only Tajikistan has submitted one — in 2019, with the latest GHG data referring to 2014. The data for the remaining Central Asia countries available on the UNFCCC website cover 2010–2012.



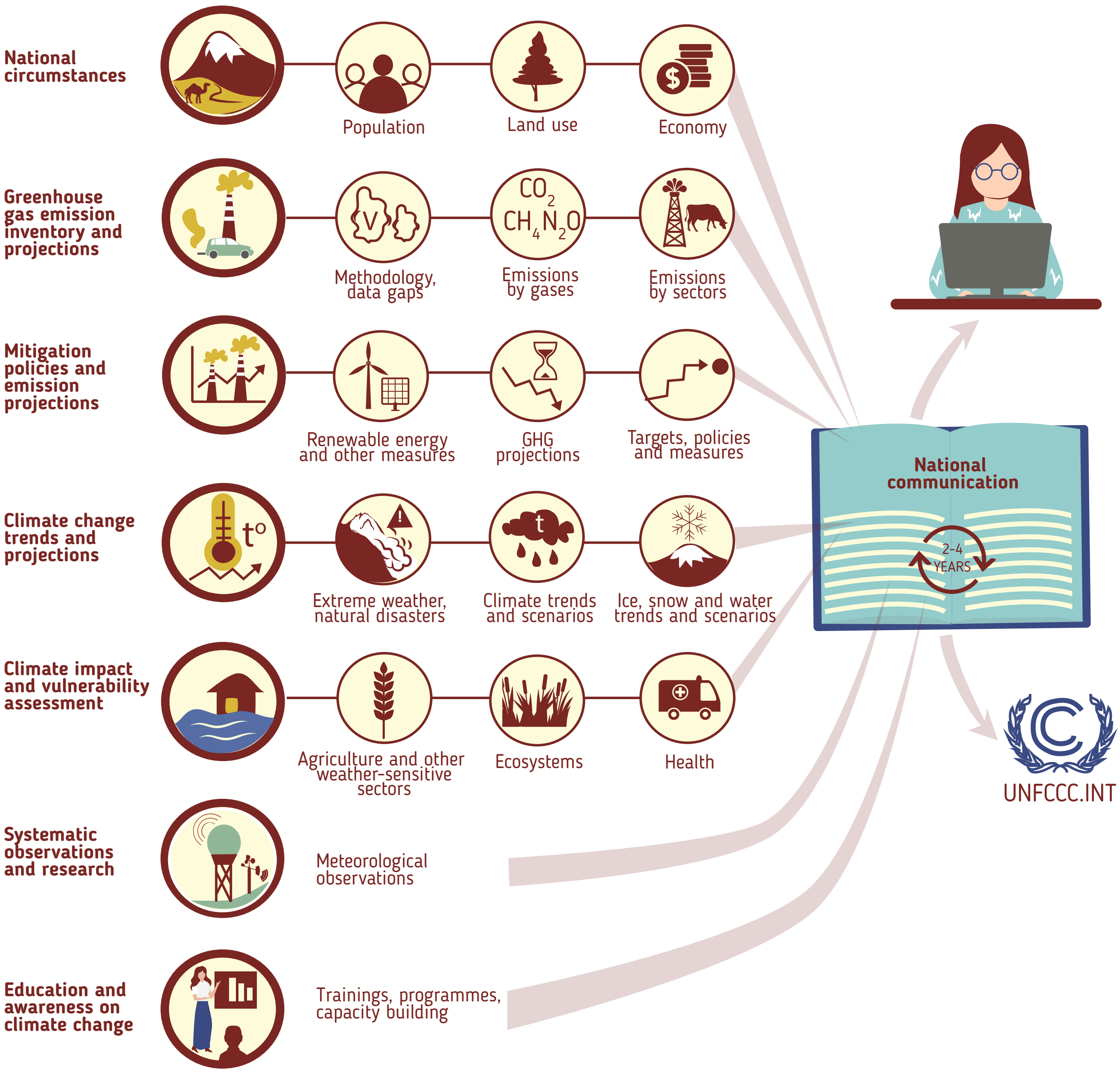
International data sources tend to be more up-to-date, but at the same time they are more general and based on estimates. The countries are now also working on the revision of their NDCs, another type of the official UNFCCC reporting.

Lay readers may find the NDC reporting confusing and complex. In presenting their mitigation goals, for example, some countries may communicate a target as not exceeding a certain level of emissions compared to a base year, and others may characterize the exact same policy target as a reduction in emissions. But reducing emissions by taking specific actions is not the same as not exceeding some previous emission level, a result that may come from socioeconomic changes unrelated to climate actions.

The measurements of emissions related to climate targets is further complicated by whether or not the effects of land use, land use change and forestry (LULUCF) are included. The difference can range from something negligible to as much as 5–15 per cent. Central Asia has a relatively low forest cover, and LULUCF is not a big factor there, but in a country such as Russia with its vast forests, the LULUCF difference in emissions can run to hundreds of millions tonnes of carbon.

The Regional Environmental Centre for Central Asia (CAREC) is conducting climate awareness activities among policymakers, NGOs and the mass media, and is well aware of these information challenges. To make climate information more understandable, CAREC is producing and disseminating simplified information and synthesis reports such as this one. With the participation of stakeholders, CAREC has designed a Central Asia climate information portal (CACIP) that will provide tailored and selected practical information on climate change. A list of useful information sources is available in the References section of this report.

Scope and content of national communications



3. Climate trends, projections and impacts in Central Asia

Temperature change between 1976 and 2019

Temperature trends

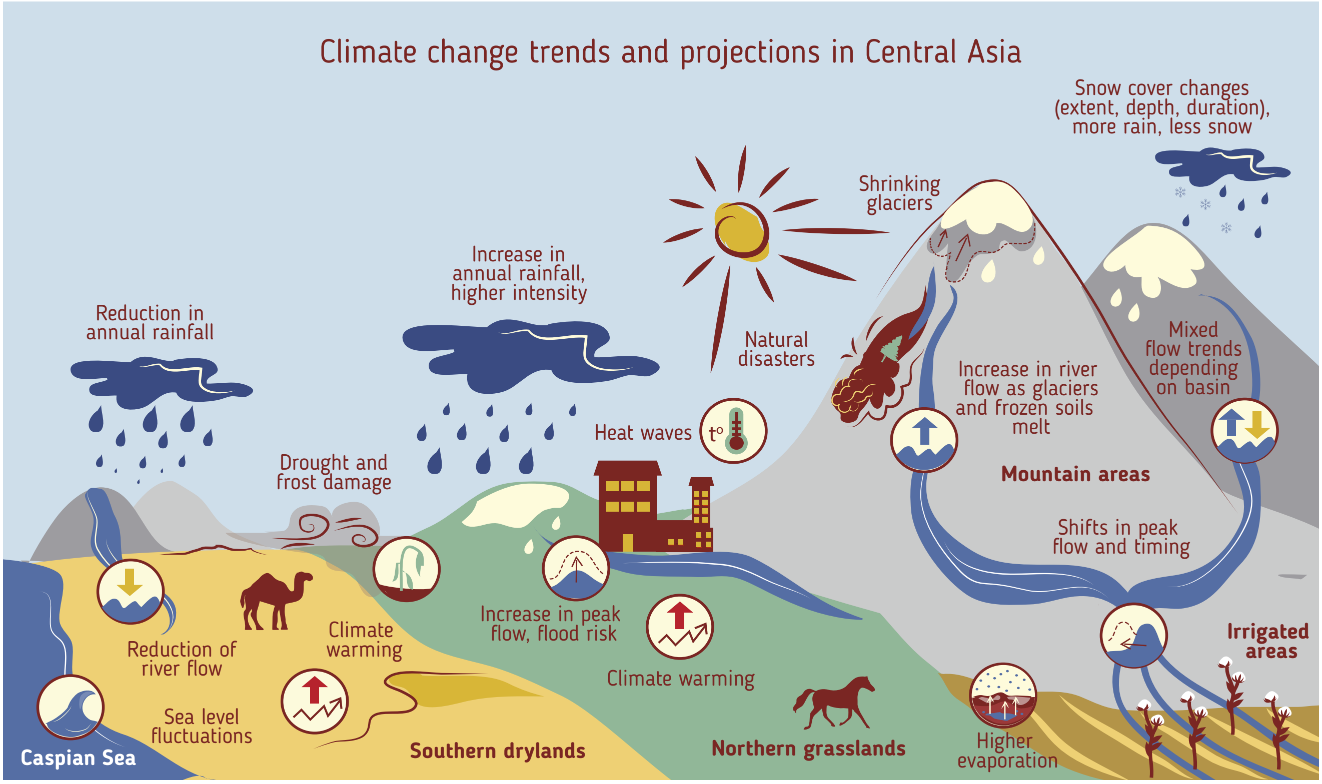
The steady temperature increases in Central Asia over the last 40–50 years (0.15 °C – 0.5 °C/10 years) have come with more pronounced warming during the spring months (0.6 °C/10 years), and affect the valleys and lowlands more than the mountains. Climate models project temperatures in the region to increase 2.5 °C – 6.5 °C by the end of the century compared to the 1961–1990 period. This warming is capable of reducing the region's glaciers by more than half of their current mass.

Precipitation change between 1976 and 2019

Precipitation trends

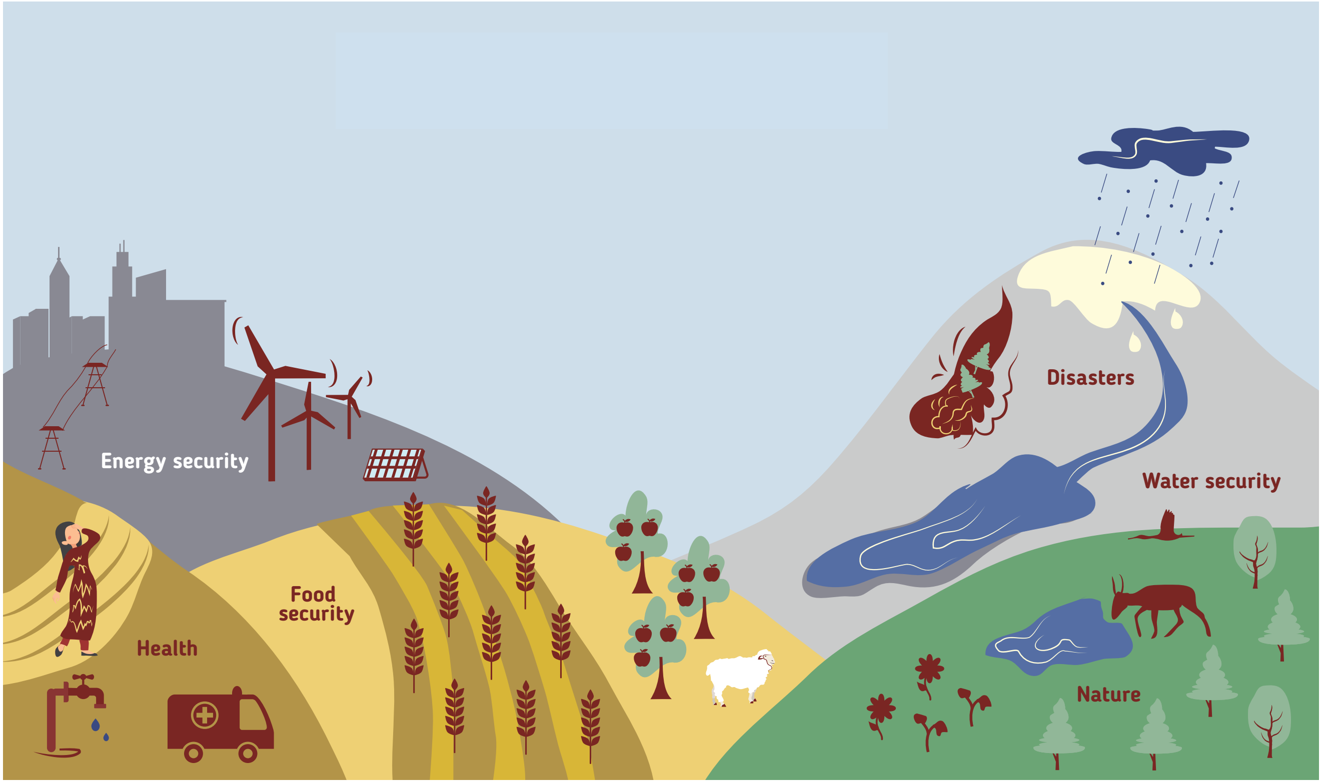
Changes in precipitation patterns over the past 40–50 years have varied across the region from an increase of 1–5 per cent in northern and eastern areas to a decrease of 1–5 per cent in the central and southern areas of Central Asia. Precipitation projections show a continuation of these patterns with the region's south-west areas becoming drier and north-east regions becoming wetter. Heavy rainfall events are expected to increase in frequency, as are droughts.

Climate change trends and projections in Central Asia



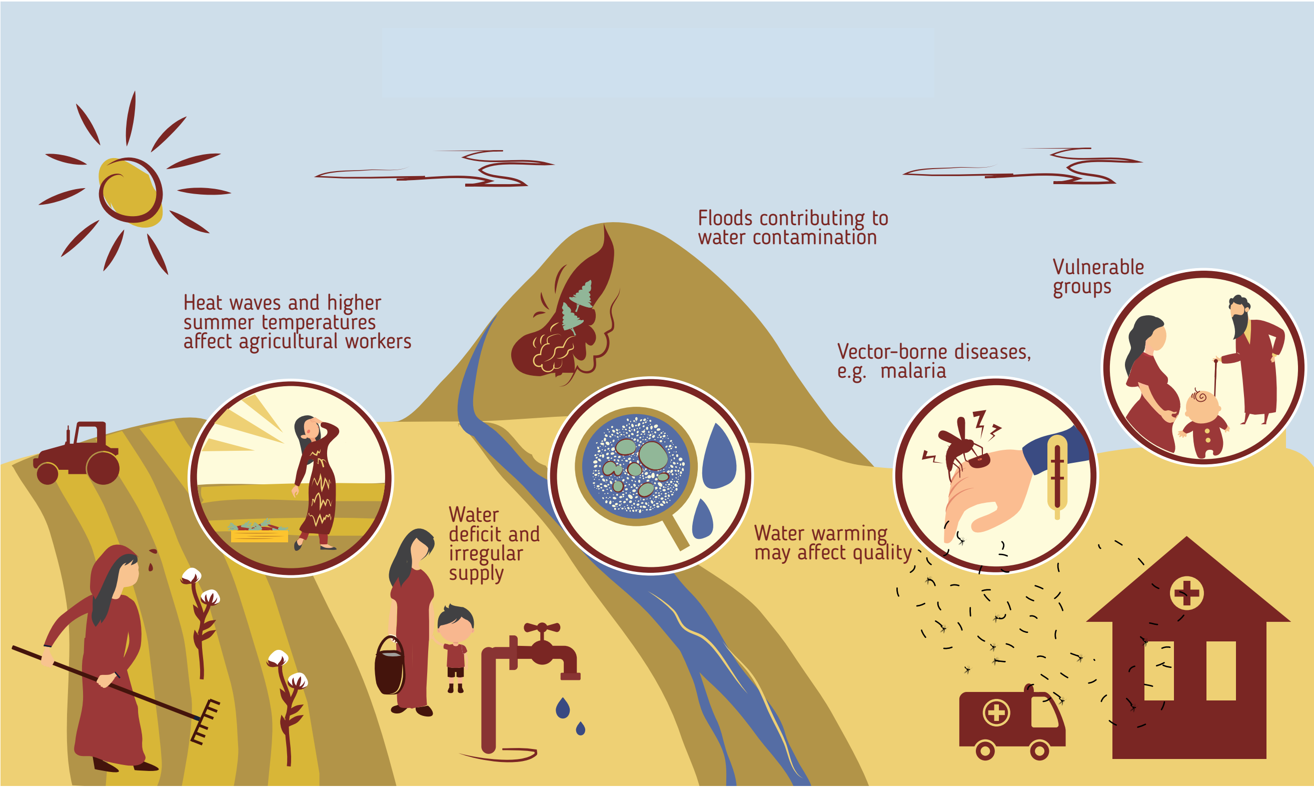
Climate change affects all three components of the cryosphere — glaciers, snow and permafrost. Warmer temperatures reduce the area and depth of snow cover and shorten the duration. The retreat of glaciers since the 1970s in Central Asia is most pronounced in the Tien Shan and at lower elevations of the Pamir-Alai Mountains. Today's rate of glacier loss is 0.2–1 per cent per year in volume. Many small glaciers have already disappeared. Higher surface temperatures result in increased evaporation and reduced soil moisture content, especially during the dry summer months, thereby amplifying the risk of droughts in lowlands and reducing the amount of surface run-off in mountains. The number of days with temperature above 40 °C has been increasing in the densely populated southern areas of Central Asia. This has a negative impact on agriculture and rural and urban populations affected by heatwaves. The populated areas in the grasslands face higher risk of floods, and torrential rains in areas near the mountains where most of population lives bring localized but damaging flash floods. The drier conditions in the southern areas call for more water efficient technologies.

Key areas of concern



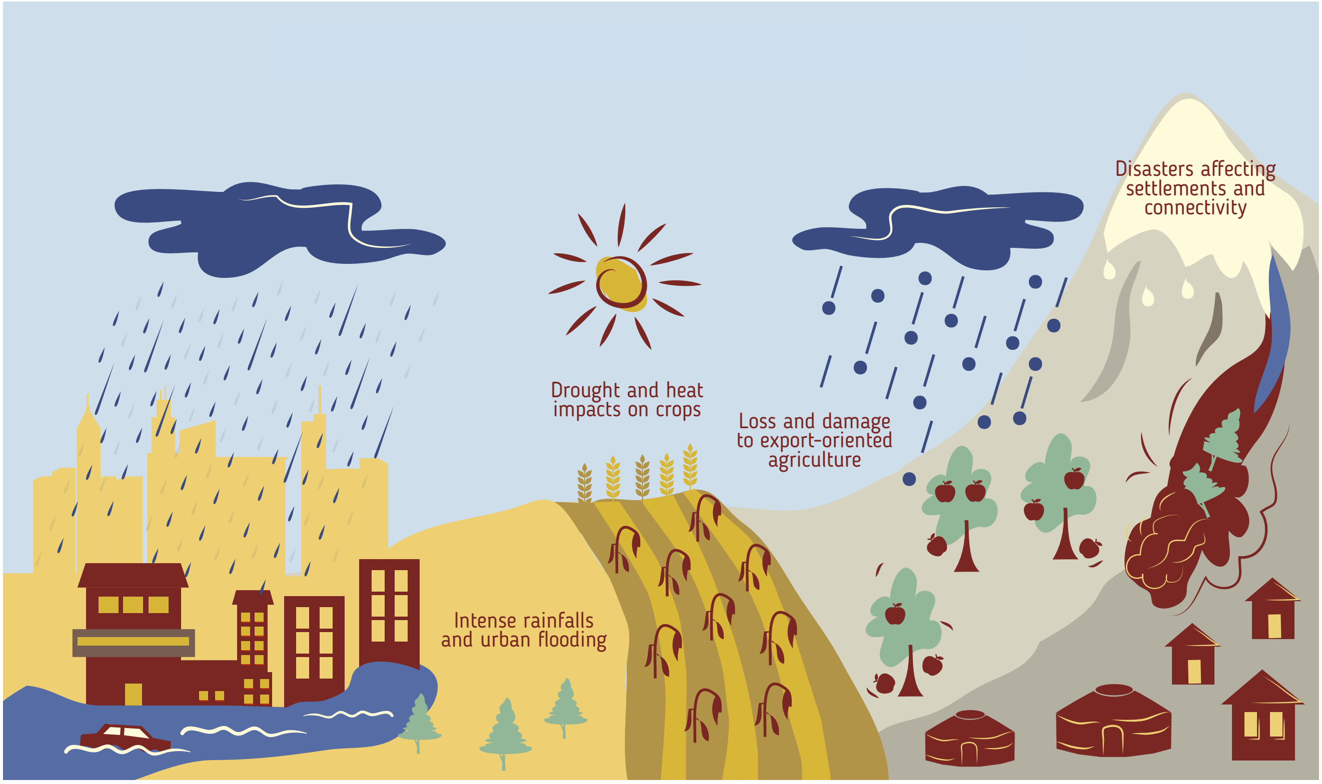
The melting of glaciers is adding glacial lake outburst floods to the list of natural disasters in the mountains of Central Asia, and along with disrupted precipitation patterns and more frequent and intense droughts this melting increases the risk of water insecurity. The disruptions in water flow also affect hydropower generation and raise the spectre of energy insecurity. For the agriculture sector, water insecurity combines with drier conditions to put the region's food security at risk. Nature suffers a series of insults — loss of vegetation used for fuel, soil erosion resulting from droughts and floods, pest infestations at higher latitudes and elevations, and loss of biodiversity to invasive species. Severe weather may cause disease outbreaks or wipe out sizable populations of endangered species. Heatwaves and cold spells increase human health risks, and floods, avalanches and mudslides bring injury and loss of life and property.

Health



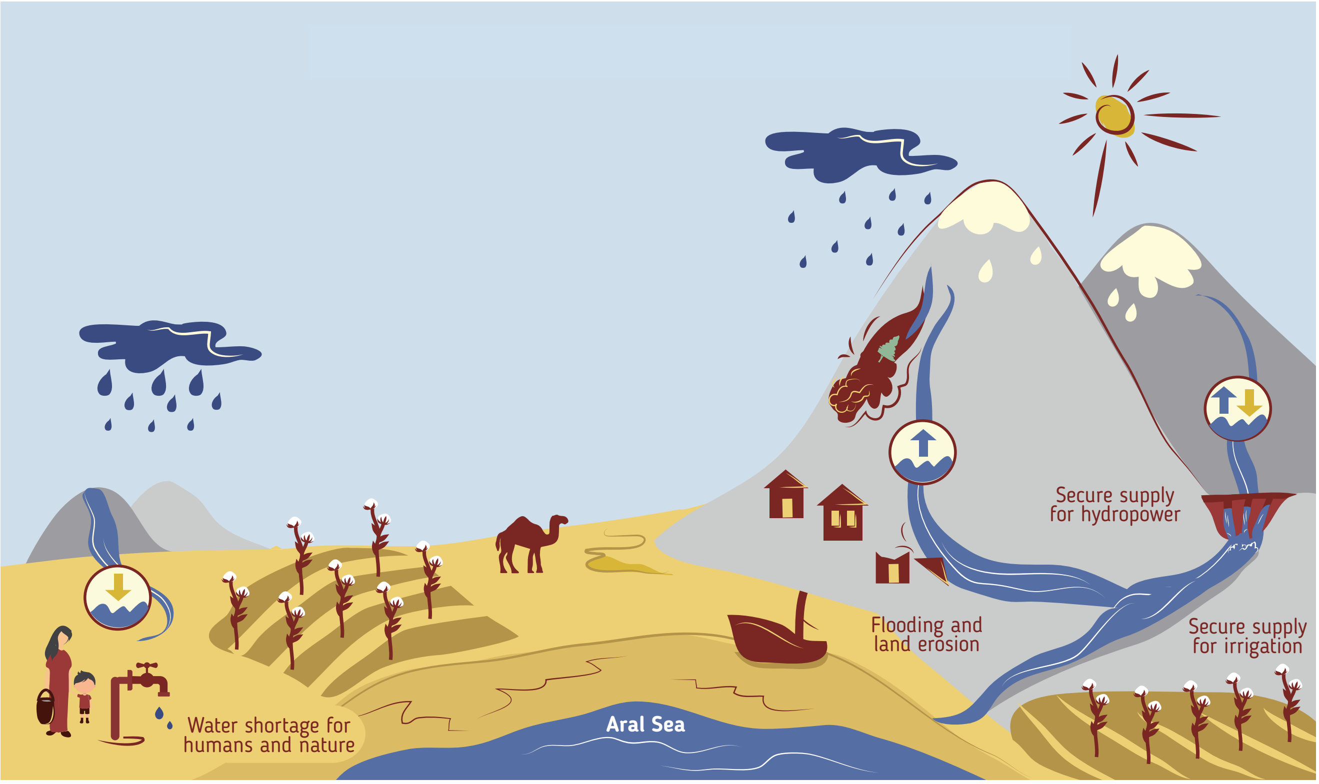
The human health effects resulting from disruptions in the physical, biological and ecological systems include increased respiratory and cardiovascular disease. As temperatures rise, the prevalence of food- and water-borne illnesses and infectious diseases can change and spread geographically. Heat stress can threaten those who work outdoors or live in urban areas. Climate disruptions threaten food security, and those living in poverty are particularly vulnerable to the health consequences — malnutrition and increased risk of disease. As the frequency and intensity of storms increase, so do the prospects for floods, landslides and mudflows that can damage infrastructure critical to public health — hospitals, roads, sanitation, water supply and electricity.

Disasters



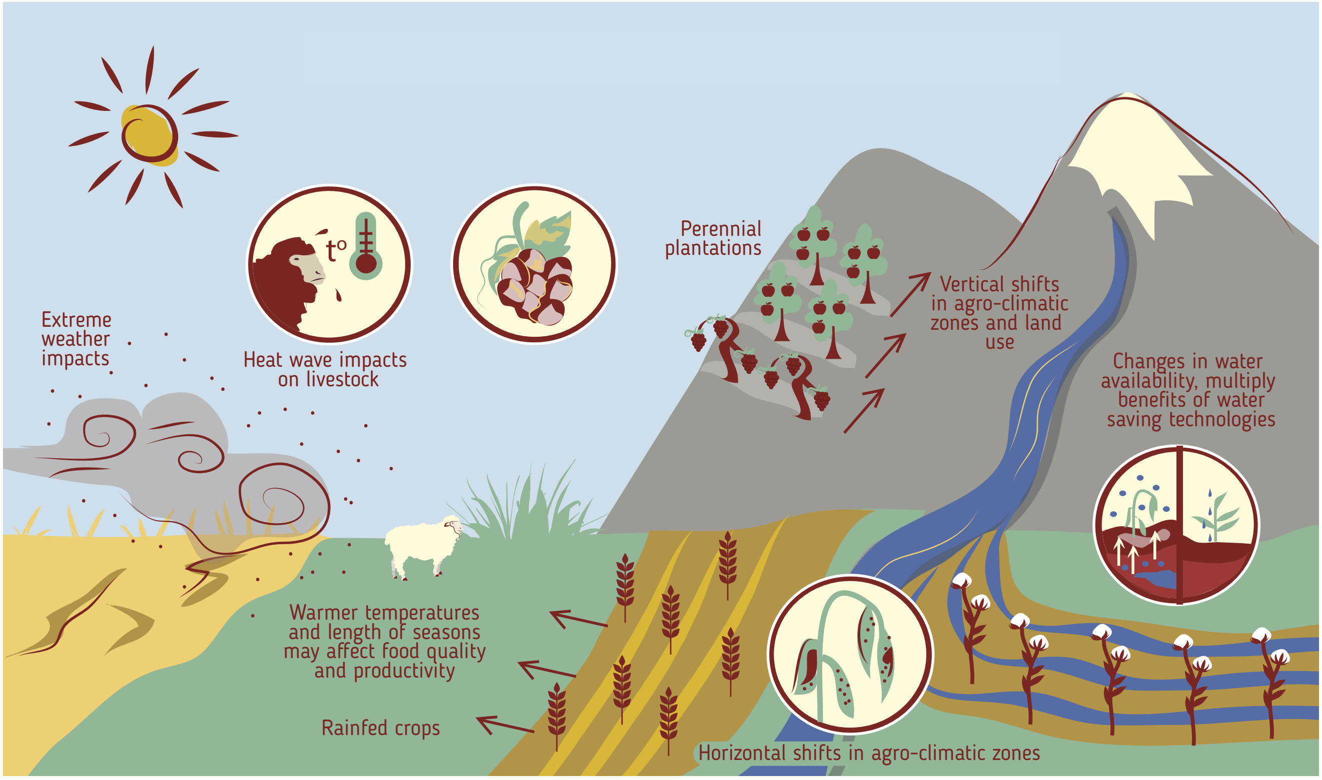
Droughts, heatwaves, severe storms, wildfires and floods all pose threats to agriculture, and one or more of these disasters could affect large populations and cause food insecurity at an alarming scale. In the mountains, storms and flooding cause landslides and mudflows and pose threats to property, lives and livelihoods both in mountain communities and in communities downstream. Glacial lake outburst floods are a particular concern where glaciers are retreating. These events collect sediments, rocks and debris as they move downstream and build in power and scale. The warming of the cryosphere increases the likelihood of these floods, and the increased frequency and intensity of storms makes other flooding more likely. Rapid warming in winter can lead to increased risk for avalanches.

Water security



The mountains of Central Asia are the water towers for the region, and the cryosphere there largely determines the amount of water resources and the timing of flows. The increased melting of snow and glacial ice will initially increase flows and shift peak flows from summer to spring, and when the snow cover and glaciers have retreated sufficiently, annual flows will decline. Scientists estimate peak water for the major rivers of Central Asia by 2050, though smaller but important rivers — such as Chu and Talas basin — may face peak water this decade, after which water resources may decline. Downstream warming will accelerate evaporation and will increase the demand for water. The expected increase in the frequency and duration of droughts complicates the picture. The availability of water for drinking and sanitation may be compromised by competing uses — irrigation and hydropower — and projected increases in population imply increases in water demand. The climate effects on water are also likely to diminish the region's biodiversity and other ecosystem services.

Food production and security



The shift in timing of peak water flows from summer to spring may be detrimental to agricultural production particularly for cotton and rice, and heat stress is projected to reduce wheat yields. In addition, higher temperatures and disrupted rainfall patterns may contribute to increased outbreaks of agricultural pests and diseases. Droughts and desertification are already problems in the region, and along with high soil salinity are diminishing crop productivity. A higher frequency of warm days and warm nights may affect some crops and livestock. The likely decrease in water access, the warmer temperatures and the variable precipitation patterns can create biological stress on animals, and may increase the spread of infectious diseases among livestock. Overgrazed and degraded pastures are vulnerable to desertification, storms and drought. Any of these potential problems could result in short-term food insecurity at a local level, and a combination of adverse events could cause longer and more widespread food insecurity.

Population, agriculture and water

Major rivers and diversion canals

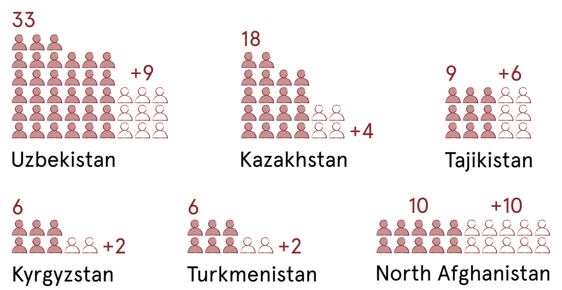
Rainfed crops

Irrigated crops

Melting of glaciers

Water stressed areas

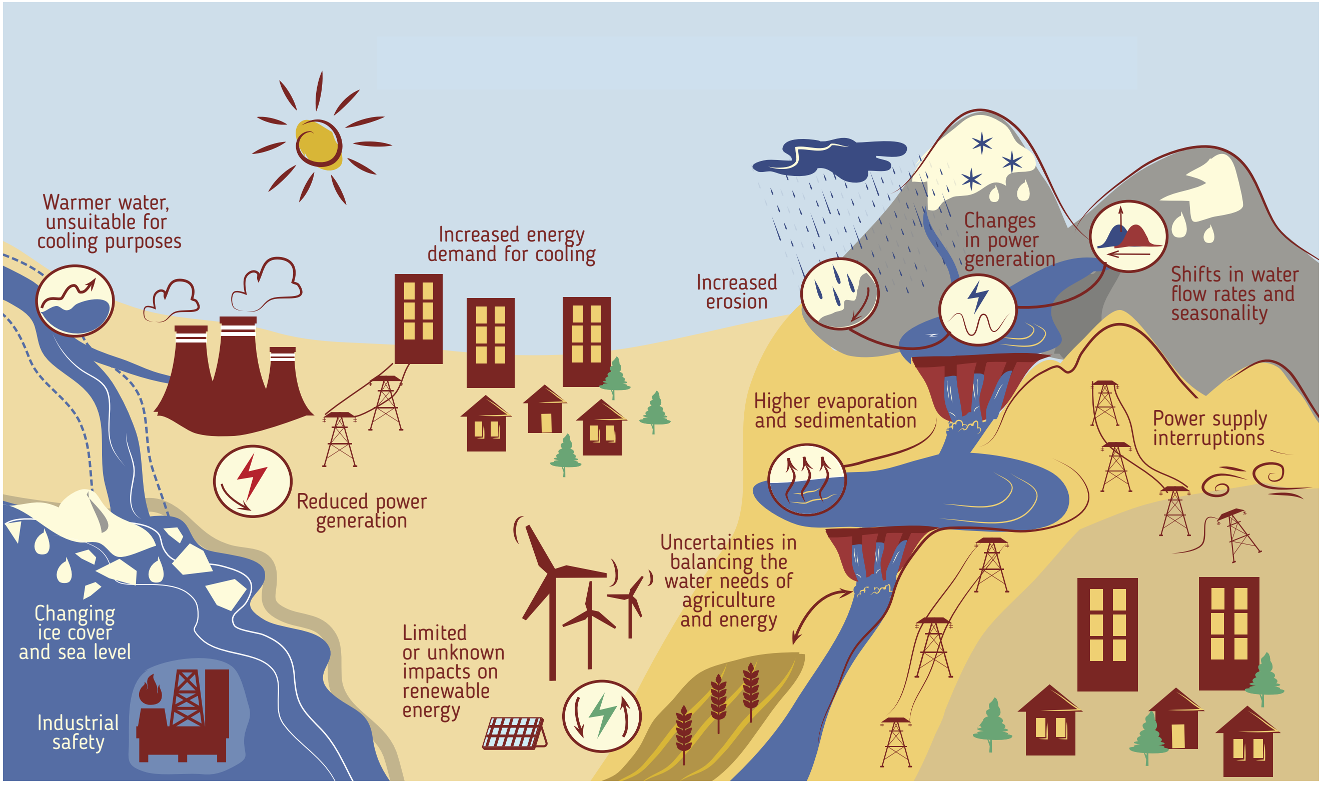
Rural population and woman as most vulnerable groups



Current population in million (2018)

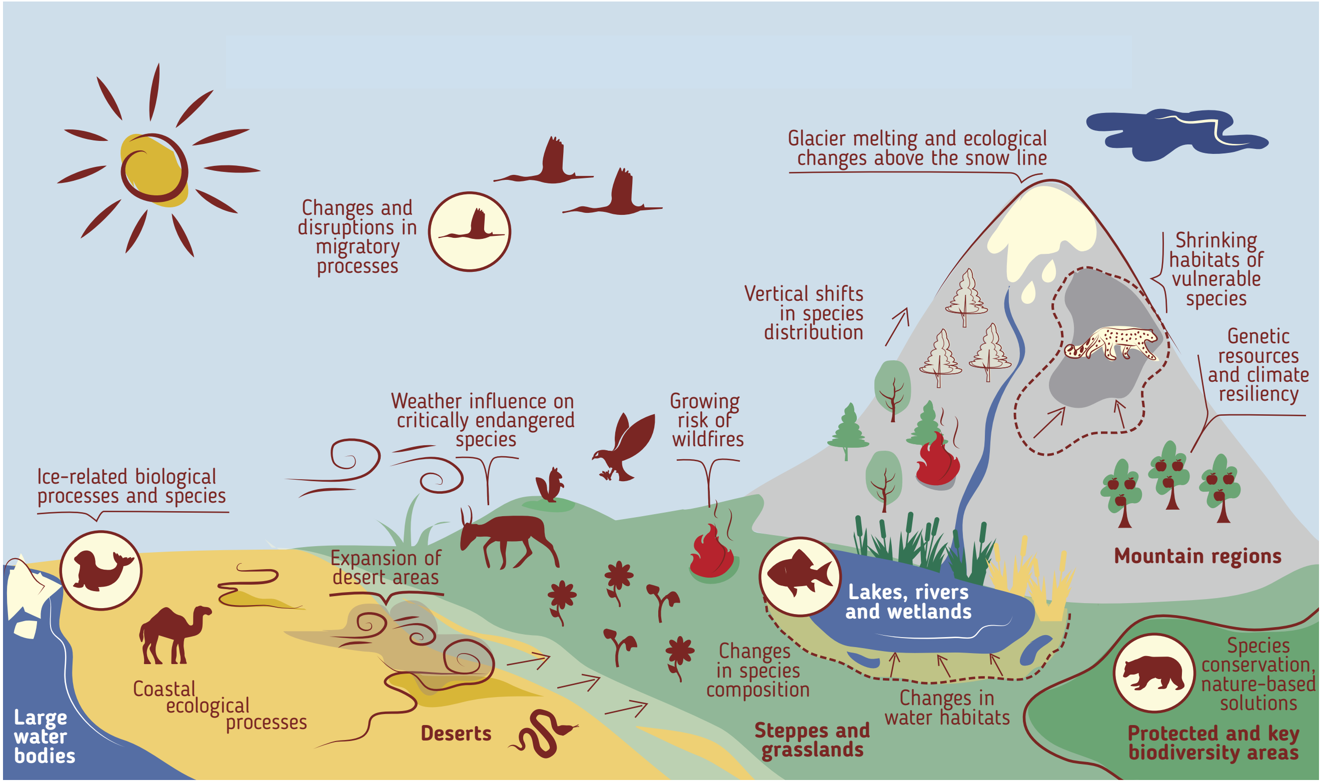
and projected growth (2050)

Energy security



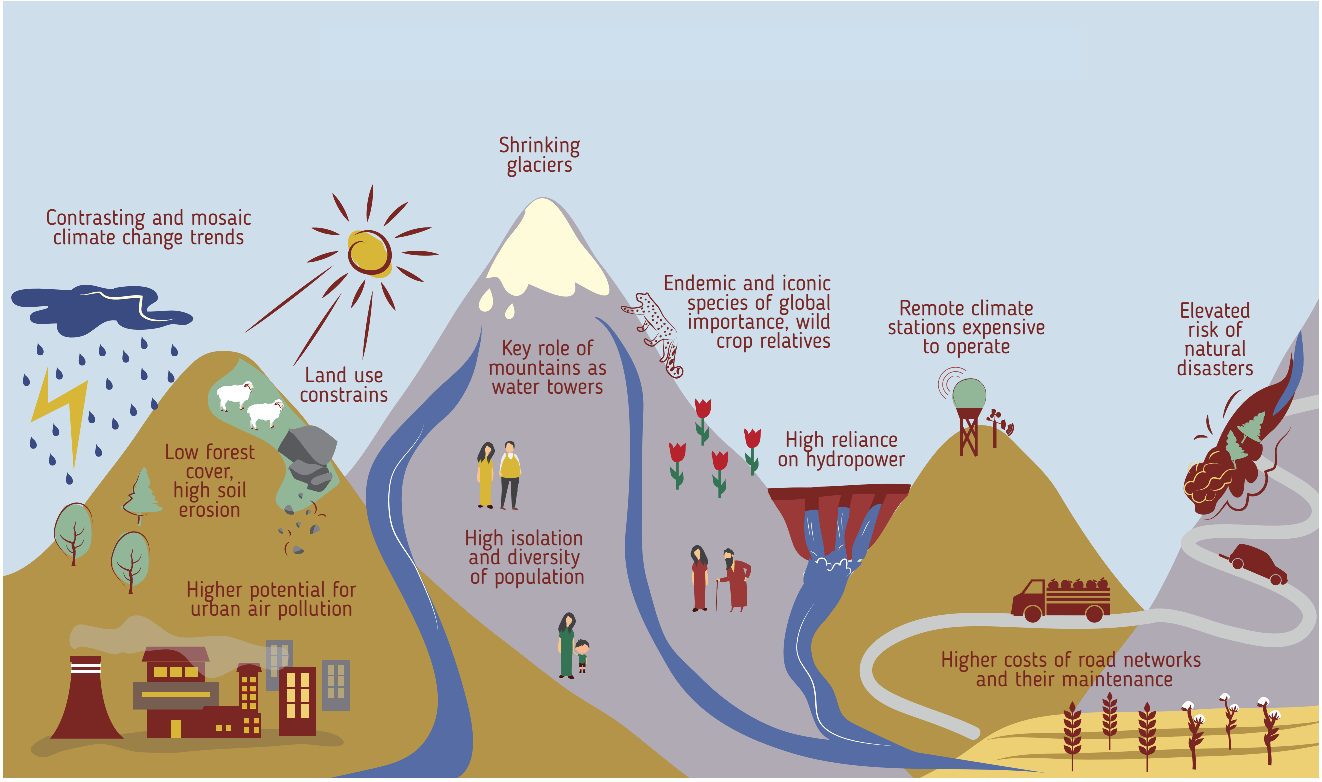
Most of the region's plentiful hydropower resources are concentrated in Kyrgyzstan and Tajikistan, but inadequate infrastructure and outmoded systems preclude the efficient distribution of the power. Some communities are ill served, and power outages are common, especially in winter. The generation and transmission facilities and other energy infrastructure are vulnerable to increasing temperatures and storms. Power plants in western Kazakhstan already faced this problem when warm water temperatures reduced generating capacity. Any decline in demand for heating in winter will be more than offset by increasing cooling demands and pumping for irrigation water in summer, and by the demands associated with population growth and economic development. In the absence of climate resiliency measures and modernization, the reliability of hydropower sources may diminish in the coming years as more frequent and intense droughts and water shortages, together with changes in the timing of river flows and disrupted precipitation patterns, all conspire to affect the availability of water where and when it is needed.

Nature



Both plant and animal species are responding to the changing climate by seeking the conditions necessary for their survival. As habitats get warmer over time, the species migrate to higher elevations or latitudes. Changes in the seasonal cycles also affect habitats and behaviour. Pest infestations now occur in places where cooler temperatures once kept them away, and in some areas pests reproduce twice a year instead of once. As forests and grasslands dry out, they become prone to wildfires. Invasive species and disrupted water flows affect the biodiversity in aquatic and terrestrial habitats. In some cases habitats have no opportunities to expand to new areas, and as they are shrinking they are putting the flora and fauna — some of which may be endangered — at risk.

Special circumstances: Mountains of Central Asia



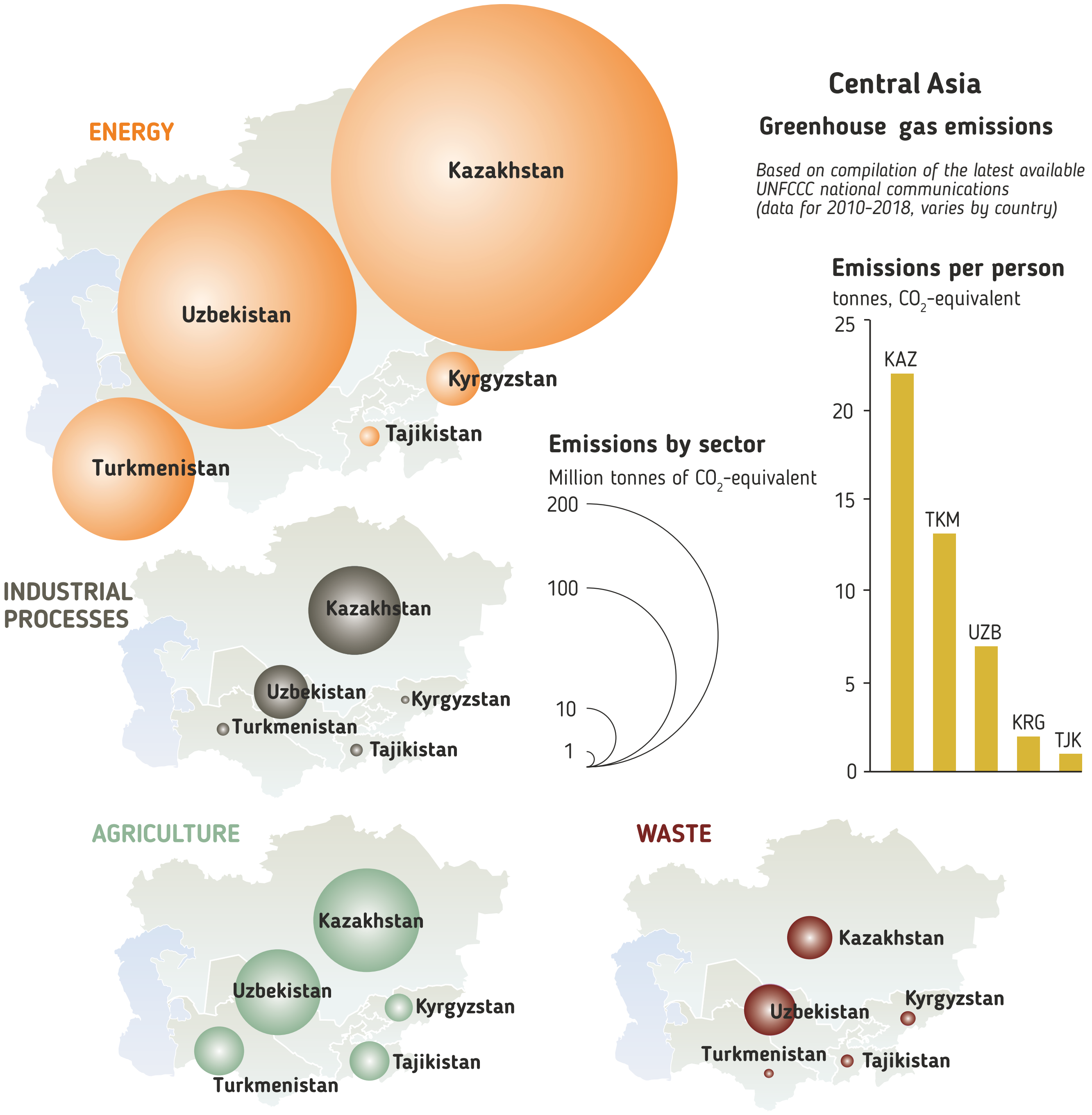
The mountains of Central Asia provide essential ecosystem goods and services that include forest products and land for food production; watershed protection; habitat for flora and fauna of local and global significance; the regulation of natural hazards and climate; and perhaps most important of all, the storage and release of water. Almost 90 per cent of the people of Central Asia rely on water that falls in the mountains where it is stored in glaciers and snow before making its way downstream to the piedmont regions where most Central Asians live. Global warming is slowly decimating mountain glaciers, affecting snow reserves and at the same time increasing the water requirements of crops. Mountain regions are crucial to the maintenance of the natural and agricultural global biodiversity. The vertical distribution of natural species by elevation results in a wide range of species and ecosystems spread over a relatively small surface area.

4. Greenhouse gas emissions and mitigation in Central Asia

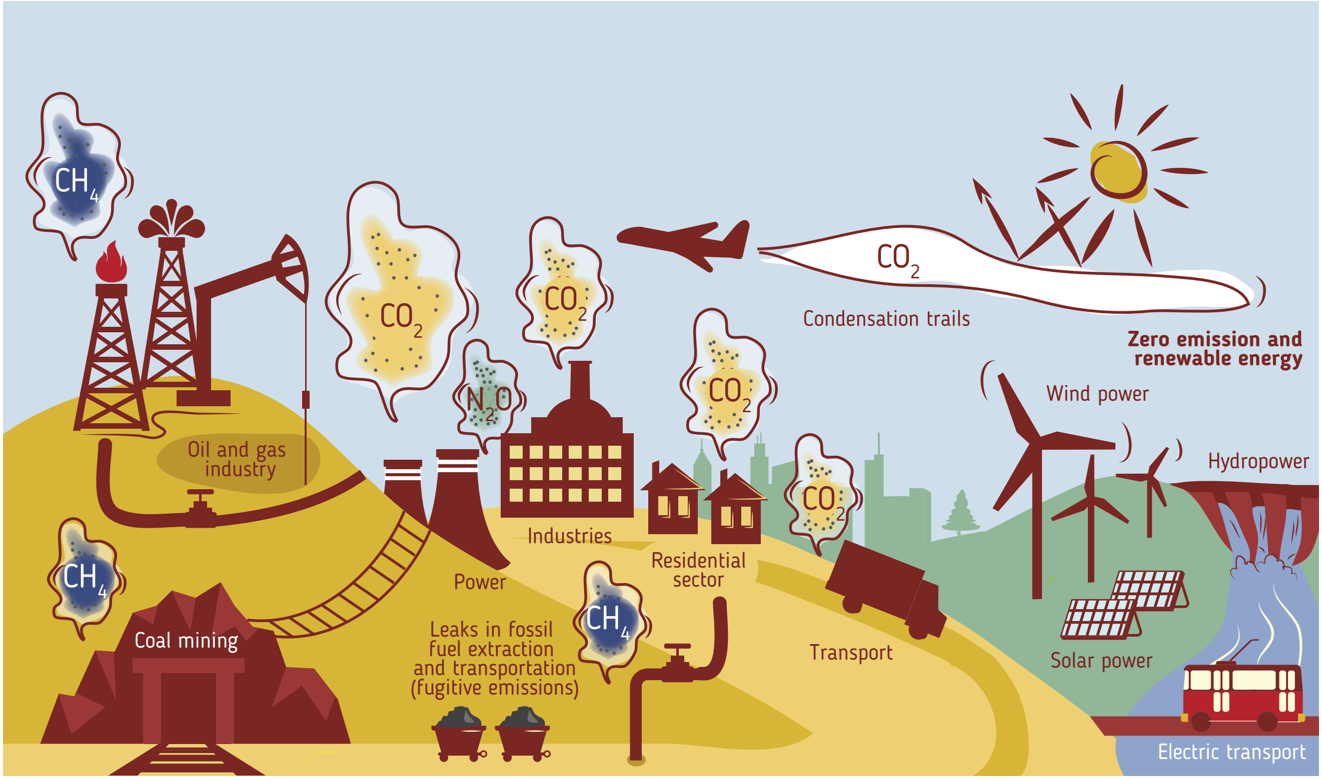
More than 80 per cent of the GHG emissions in Central Asia come from the energy sector with Kazakhstan and Uzbekistan leading the way and Turkmenistan a clear third. Kyrgyzstan's energy and agriculture sectors account for most of its emissions, and Tajikistan's abundant hydropower means that most of its emissions come from agriculture. Other major contributors include agriculture in Kazakhstan, Turkmenistan and Uzbekistan, industry in Kazakhstan and Uzbekistan, and waste in Uzbekistan.

Kazakhstan's profile is similar to the profile of the UNFCCC Annex I parties — industrialized countries and countries with economies in transition. The remaining Central Asia countries are belonging to the group of the UNFCCC Non-Annex I parties.

Turkmenistan and Uzbekistan are energy-rich countries and their emission profile reflect high energy-related methane emissions occurring in the production and transport of natural gas. Carbon dioxide emissions are lowest in Tajikistan, and the proportion of methane emissions is the highest here, mainly originating from agricultural activities. Because of their low overall emissions, the mountain countries of Kyrgyzstan and Tajikistan have very low emissions of 1–2 tonnes of CO_2 per person — well below the world average. Uzbekistan's per person emissions are slightly below the world average, while Kazakhstan and Turkmenistan are above.


Central Asia
Greenhouse gas emissions
Based on compilation of the latest available UNFCCC national communications (data for 2010-2018, varies by country)
ENERGY
Kazakhstan
Uzbekistan
Kyrgyzstan
Tajikistan
Turkmenistan
INDUSTRIAL PROCESSES
Kazakhstan
Uzbekistan
Kyrgyzstan
Turkmenistan
Tajikistan
AGRICULTURE
Kazakhstan
Uzbekistan
Kyrgyzstan
Tajikistan
Turkmenistan
WASTE
Kazakhstan
Uzbekistan
Kyrgyzstan
Turkmenistan
Tajikistan
Emissions by sector
Million tonnes of CO_2-equivalent
200
100
10
1
Emissions per person
tonnes, CO_2-equivalent
25
20
15
10
5
0
KAZ
TKM
UZB
KRG
TJK

Energy production and use

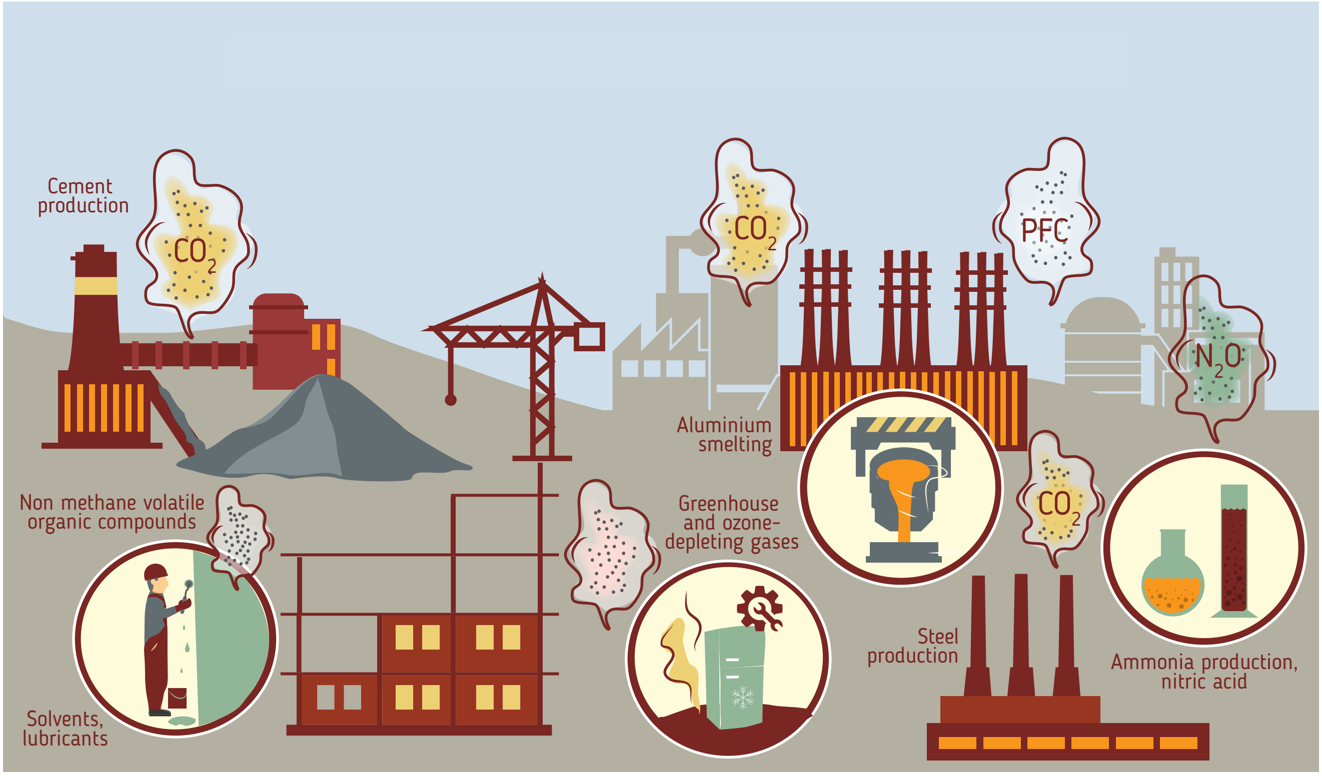


Most energy sector emissions come from the burning of coal, natural gas, and oil for electricity and heat. The rest of the sector's emissions come from fuel extraction, refining and processing.

The IPCC Fifth Assessment Report identifies the energy sector as the largest contributor to greenhouse gas emissions. The report also identifies options for reducing emissions in the sector:

- Improving energy efficiency and reducing fugitive emission in fuel extraction, and in energy conversion, transmission, and distribution systems
- Switching away from fossil fuels
- Employing renewable energy
- Making more use of nuclear power
- Using carbon dioxide capture and storage

Industrial processes



Most industrial emissions come from material processing, which is the series of steps in the conversion of natural resources or scrap into finished products. The production of iron, steel and cement, for example, accounts for almost half of industrial emissions in the world. Other important sources of industrial emissions include the production of chemicals and fertilizers, pulp and paper, non-ferrous metals, and textiles.

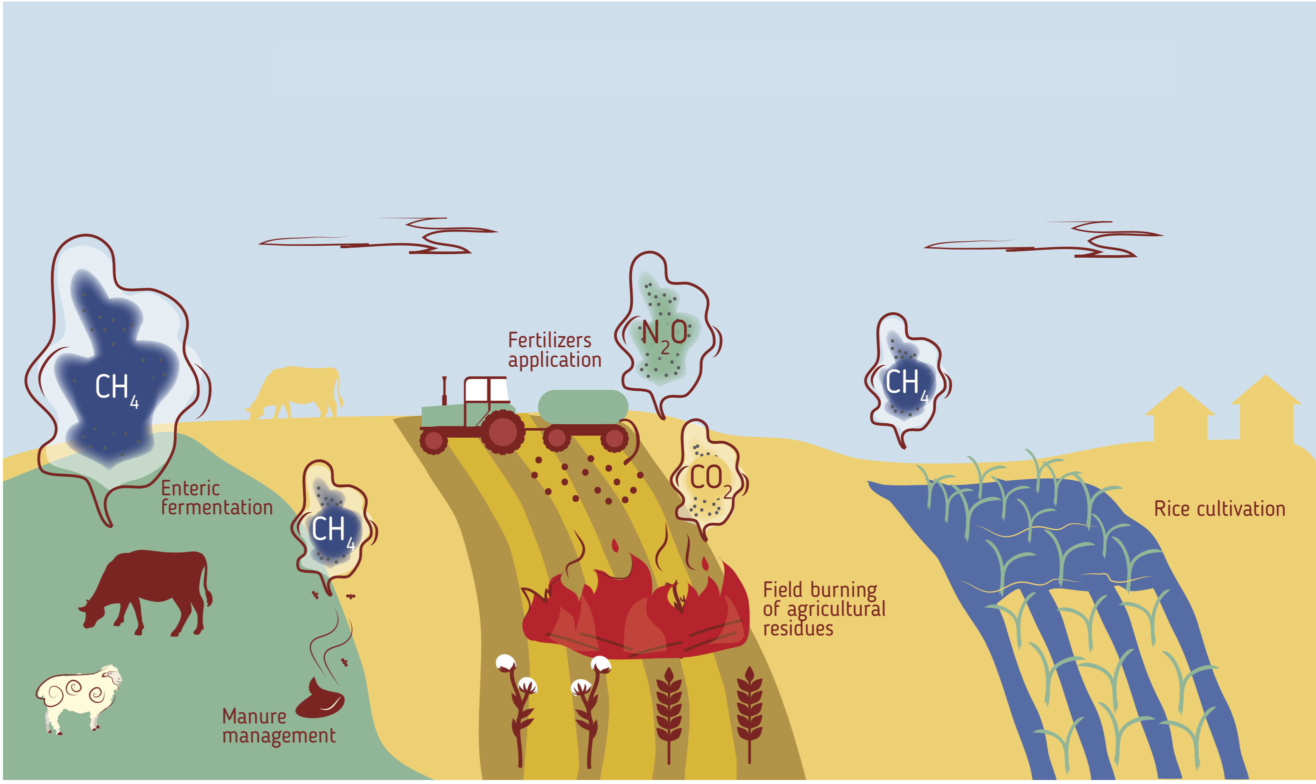
Energy and process efficiency have improved over recent decades, but industrial emissions have nevertheless increased, and continue to grow.

Other emissions reduction strategies in addition to energy efficiency include:

- Switching fuel and feedstock
- Using carbon dioxide capture and storage
- Recycling and reusing materials and products
- Increasing material use efficiency through new product design

Additional emission reductions are possible through efficiencies in product service — maintaining buildings for longer and extending the life of products — and through reductions in demand.

Agricultural activities

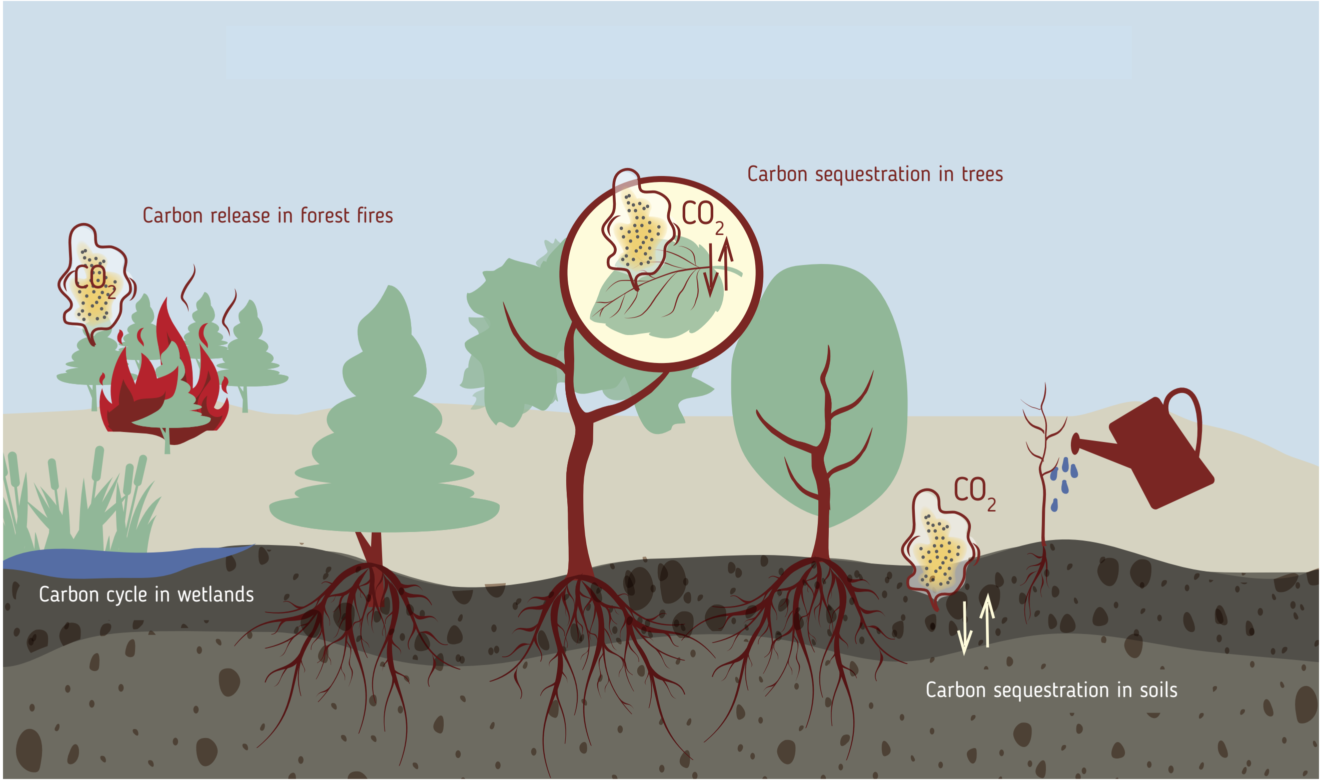


Direct production of crops and livestock accounts for most agricultural emissions. As agricultural production has increased over recent decades, so have direct agricultural emissions. Enteric fermentation — the digestive process of ruminants — produces methane emissions that add up to 40 per cent of direct agricultural emissions at the global level. Other sources that contribute to agricultural emissions include manure deposited on grazing lands; synthetic fertilizers; rice production; stored manure; and crop residues.

Mitigation strategies in agriculture include:

- Using silvopastoral systems
- Employing no-till residue management
- Increasing soil organic matter
- Reducing food losses

Forest and land management



The forestry and land use sector is generally regarded as a carbon sink — a natural system that absorbs carbon and holds it. The emissions associated with this sector primarily come from deforestation and conversions of land to agricultural uses, including loss of soil carbon due to soil degradation. Mitigation starts with taking measures to reduce the deforestation and conversions, but extends to measures to improve forest cover and reduce soil degradation.

Waste management

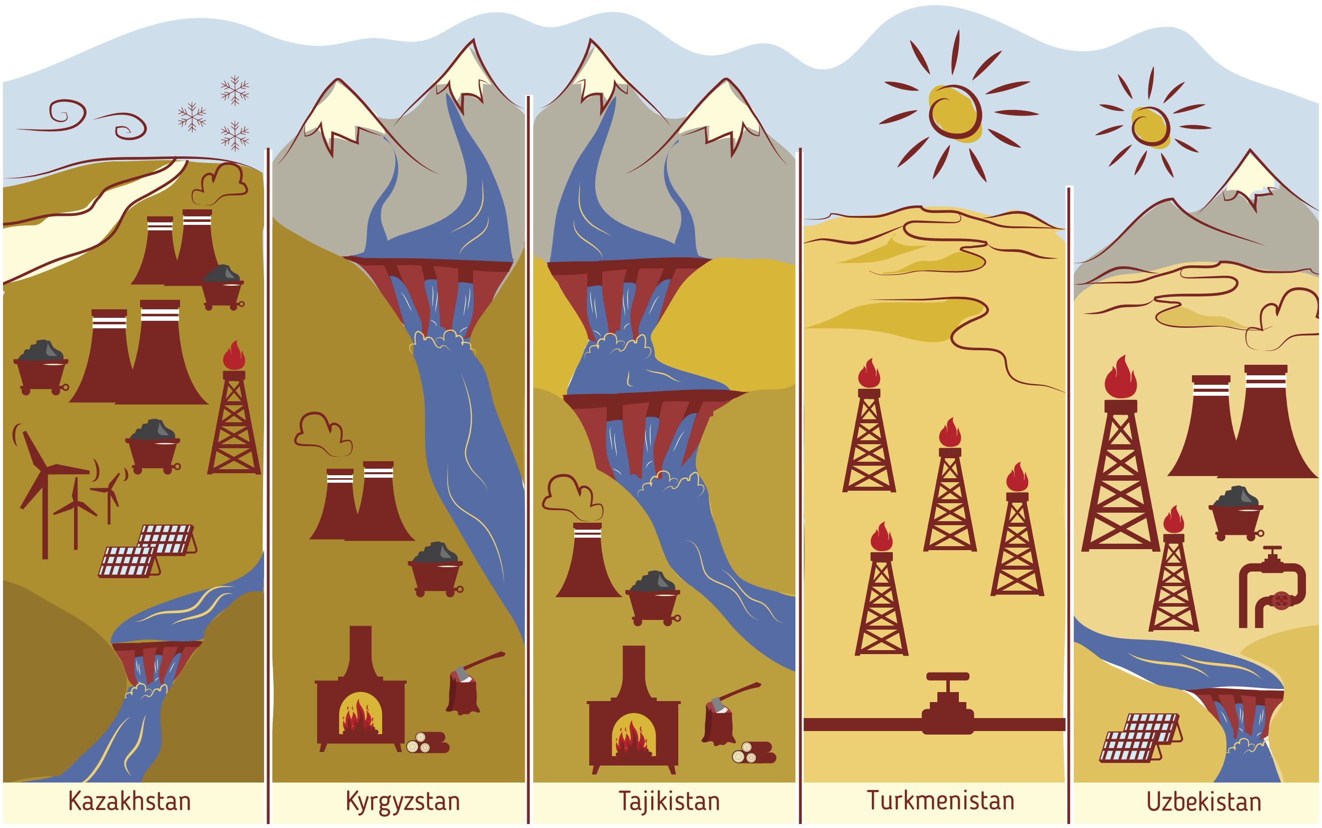
The decomposition of waste in landfills releases methane, and the incineration of waste releases carbon dioxide, nitrous oxide and other gases. The IPCC considers municipal solid waste to be the most troublesome waste, and estimates that the world generates about 1.5 Gt of this waste per year. By 2025, annual global municipal solid waste is expected to reach approximately 2.2 Gt. Between 1970 and 2010, global waste emissions per capita increased by 5 per cent.

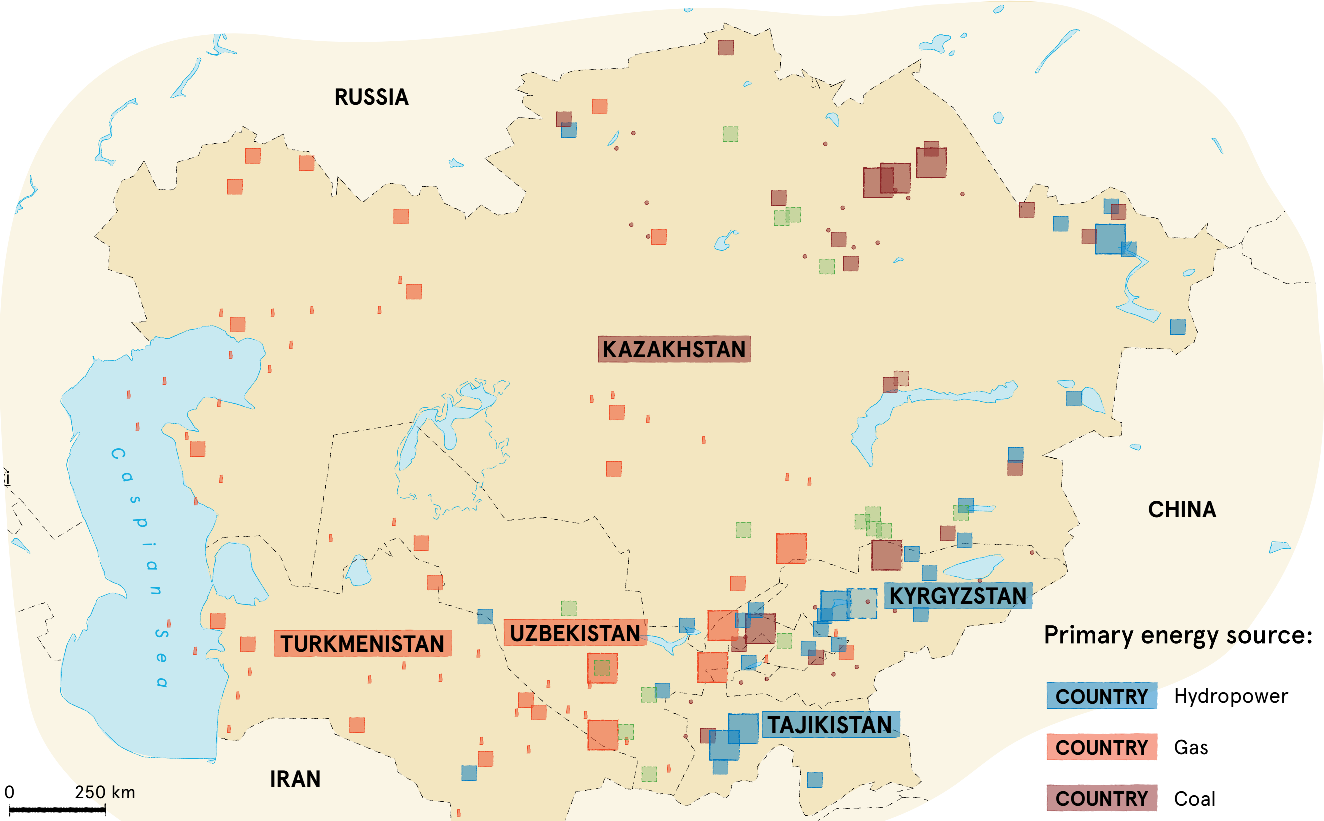
As the hierarchy of waste management shows, the best approach is avoiding the need for disposal. The IPCC identifies waste reduction during the production process as the most important mitigation option at the pre-consumer stage. The next best options on the hierarchy are reuse and recycling. Waste incineration occurs at the "Treatment without Energy Recovery" stage. The land disposal options at the bottom of the hierarchy come with emissions that increase with each lower level.

5. Clean Energy transition

Kazakhstan has made significant efforts to add renewables to its energy mix, but coal remains the most common fuel for industry and residential heating. With their reliance on hydropower, Kyrgyzstan and Tajikistan have modest emission profiles, but they are vulnerable to variability in weather and water availability. Consequently, to protect their energy security they are investing in coal, which is relatively abundant in both countries. Both countries have high proportions of rural dwellers who rely on natural fuels such as wood. Turkmenistan, a gas giant of Central Asia, relies almost exclusively on natural gas, but the massive scale of gas production and inevitable leaks of methane during transportation contribute to high carbon footprint. Uzbekistan has a diverse range of energy sources and is investing in renewables, but the contribution of renewables will not be apparent for some time. Natural gas serves the energy and industrial sectors.

Main energy sources



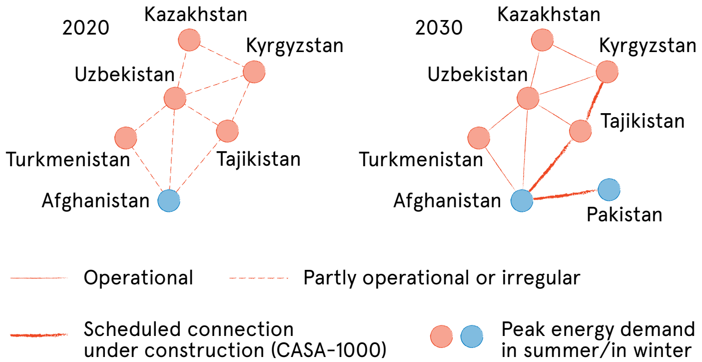


Map produced by Zoï Environment Network, October 2020

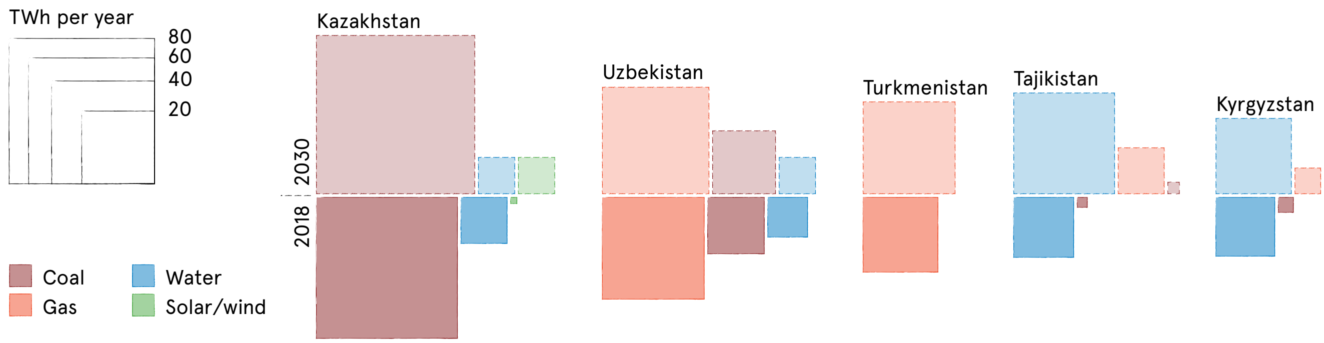
Energy

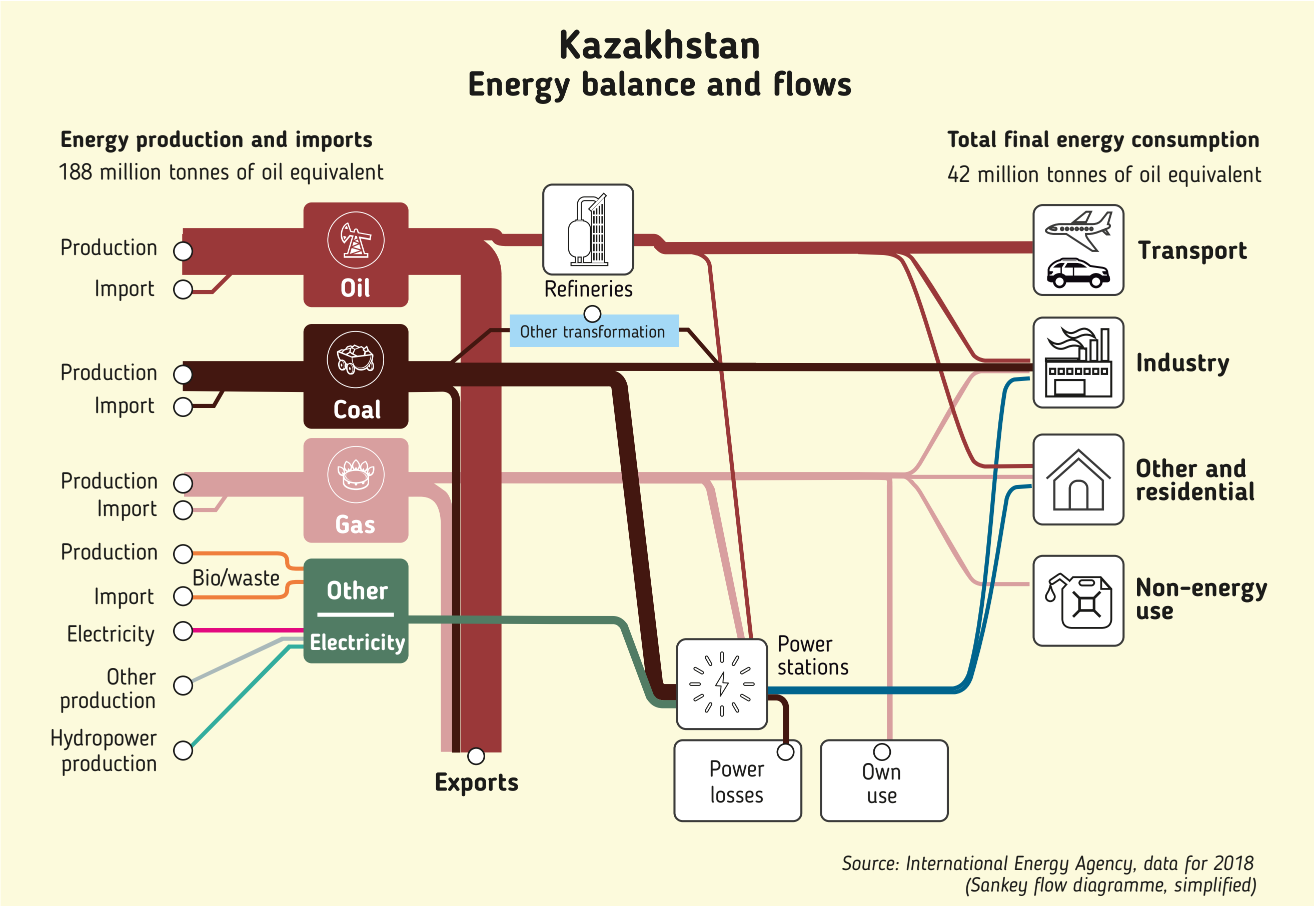
- Coal power plant, projected · Coal mining
- Gas power plant · Oil or gas production
- Hydropower plant, existing/projected
- Solar or wind power plant, projected
- Major power plant (more than 1 GW capacity)

Schematic transmission connections between countries



Energy production

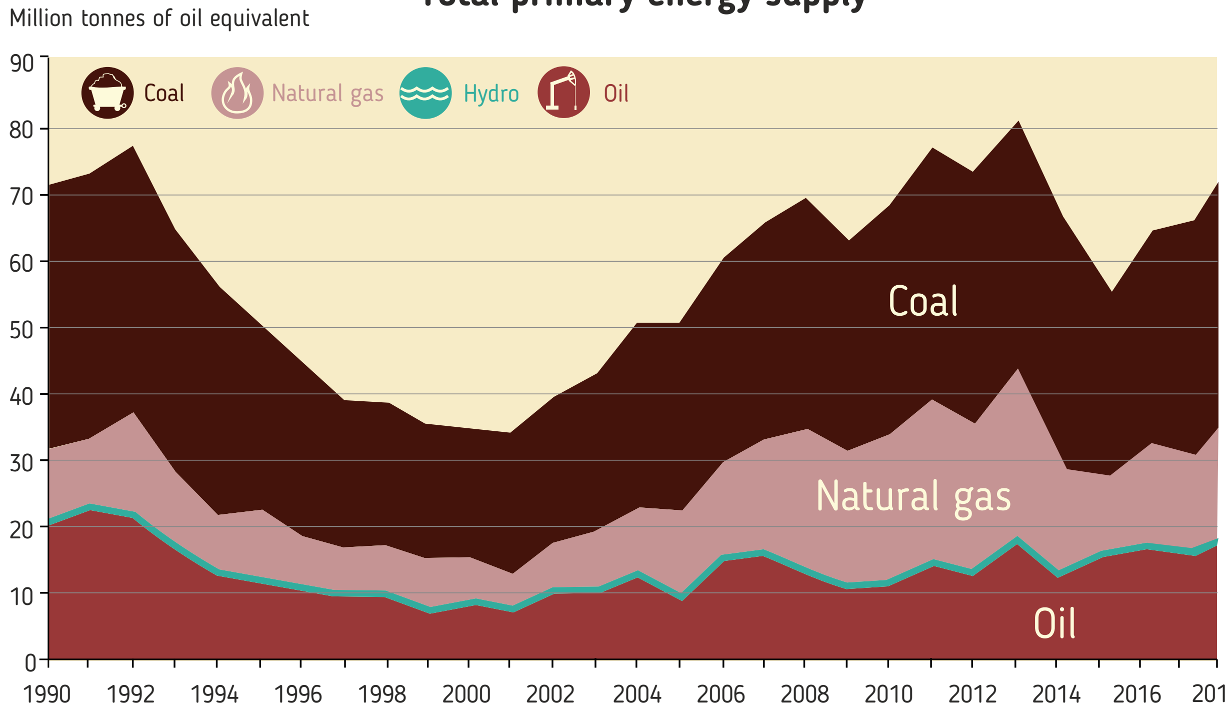




As the largest producer of oil and coal in Central Asia, Kazakhstan exports oil to the West and China. The practice of gasification is growing, most the gas is exported and part is being used in oil well operations and other energy sector needs. Coal dominates electricity production, and consequently, Kazakhstan has the highest carbon emissions throughout the region. Renewable energy such as hydropower currently makes up a small share of the overall energy mix, but solar and wind power plants are mushrooming across the country thanks to legislation, clean energy targets and the investment climate.

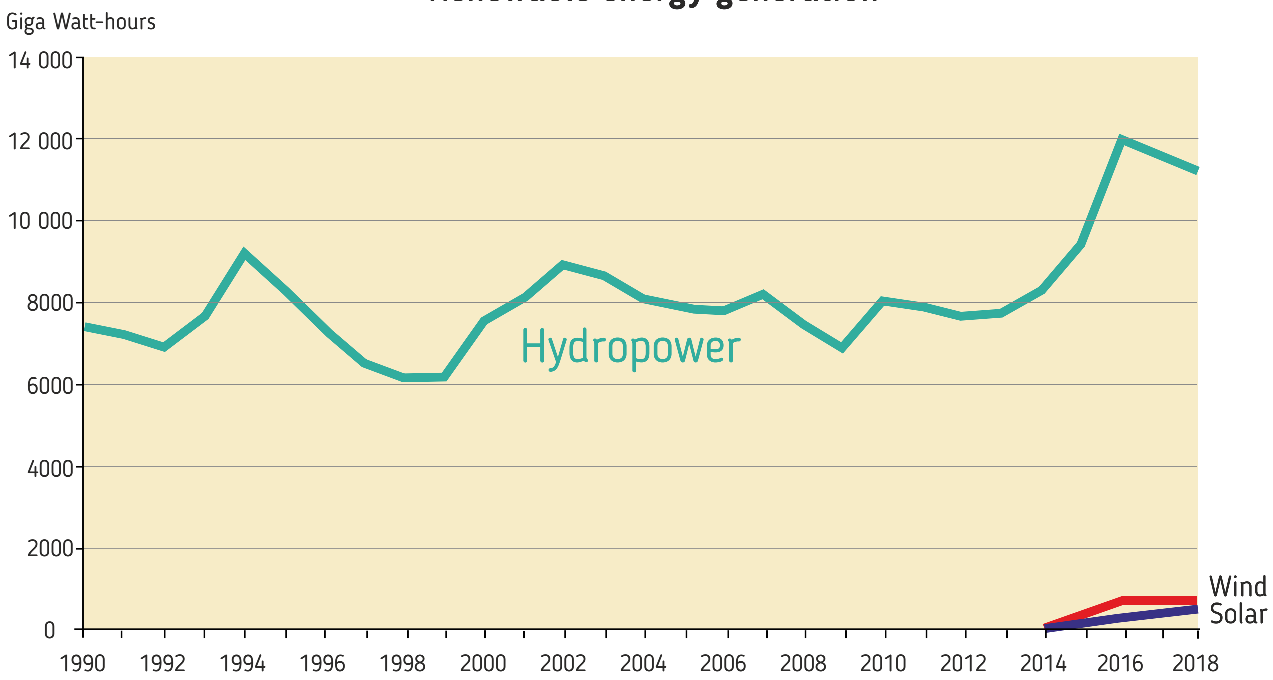
Kazakhstan

Total primary energy supply

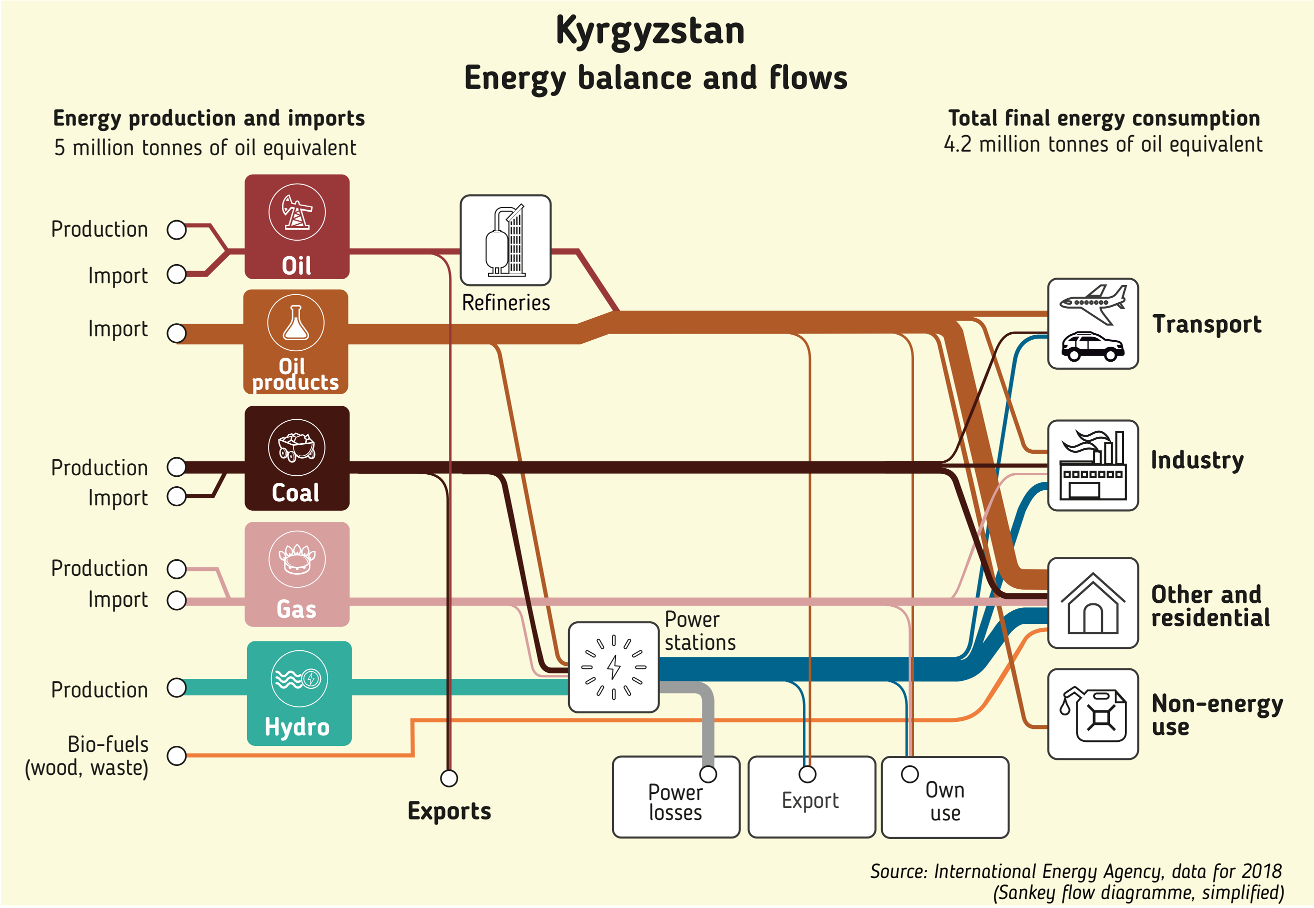


Source: International Energy Agency (IEA, www.iea.org), country profiles

Renewable energy generation

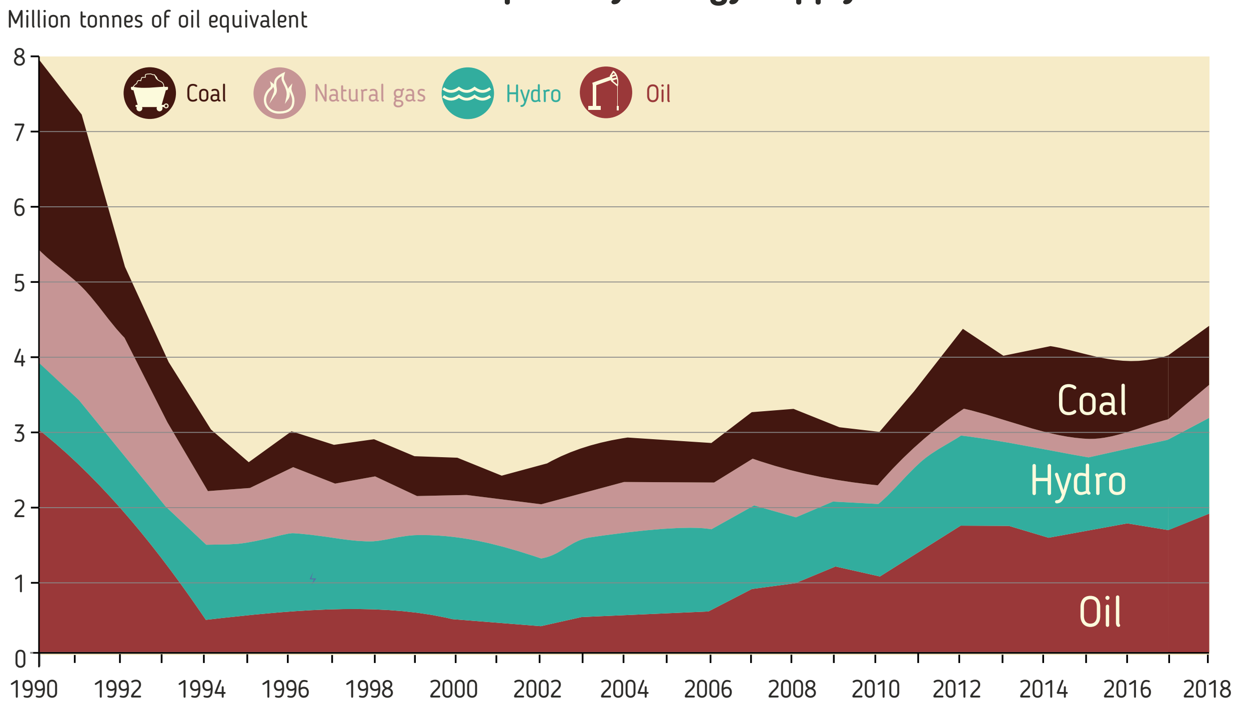


Source: International Energy Agency (IEA, www.iea.org), country profiles



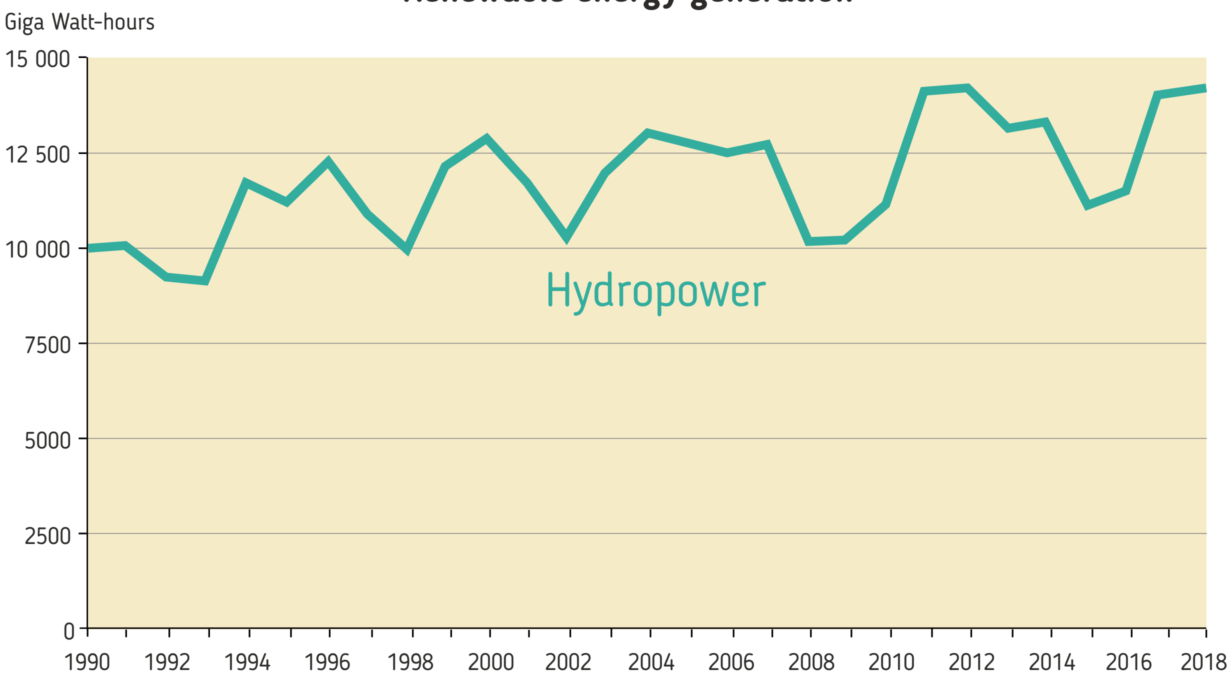
Kyrgyzstan is heavily reliant on hydropower and coal for electricity generation. Its oil products and gas are almost entirely imported, with marginal domestic production and refinement within the country. Coal is mainly used for domestic heating and energy and heat generation in the capital city of Bishkek, and coal use may grow in the coming years due to plans for the expansion of coal thermal plants. The high share of hydropower in Kyrgyzstan's energy mix results in lower emissions overall, but furthering the clean energy transition is limited by the country's lack of other renewable energy options or investments in major hydro-power plants on the Naryn River cascade.

Kyrgyzstan
Total primary energy supply

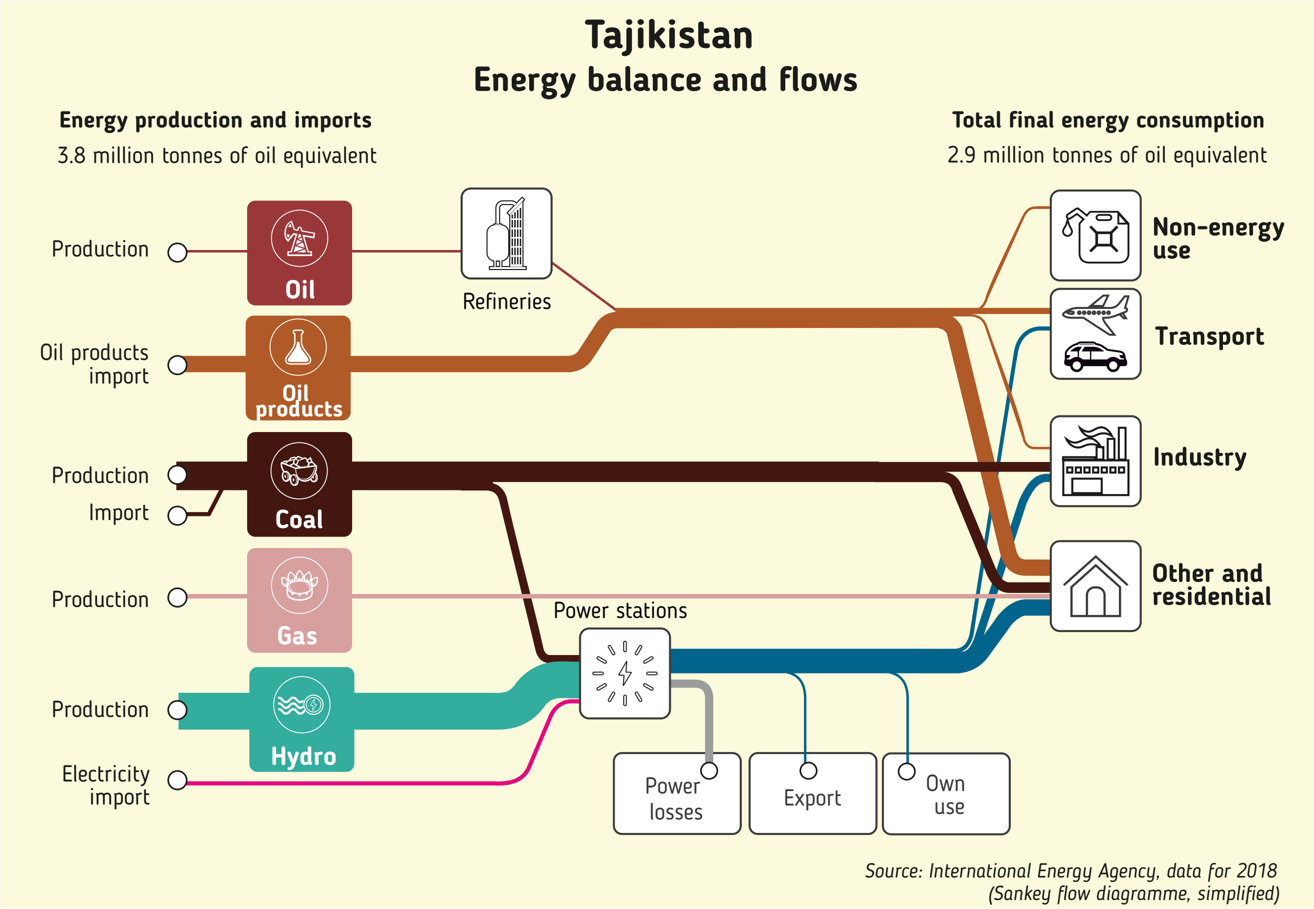


Source: International Energy Agency (IEA, www.iea.org), country profiles

Renewable energy generation



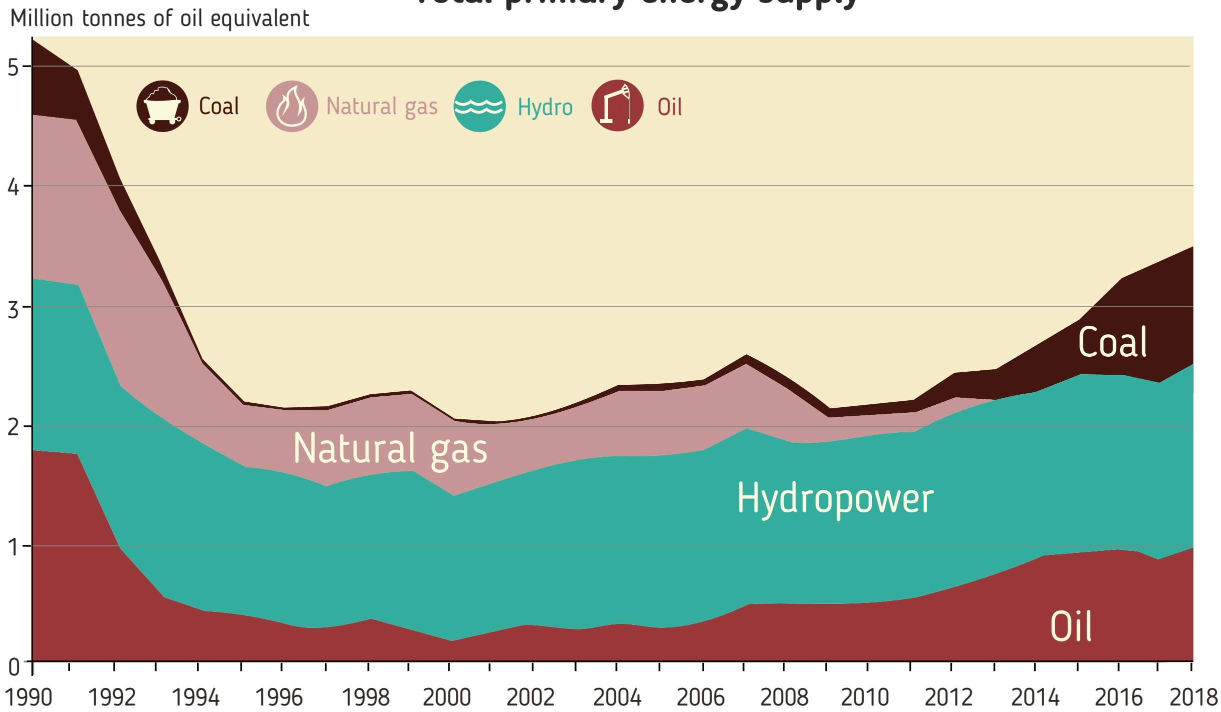
Source: International Energy Agency (IEA, www.iea.org), country profiles



Tajikistan relies primarily on renewable hydropower for energy, and Its use of oil and gas depends almost entirely on imports. The high costs of these sources contribute to the country's energy poverty. The price of gasoline in Tajikistan is the highest in the region, and car ownership and use per person is the lowest. More than half of the car fleet uses natural gas — a low carbon-emitting fuel. Altogether, the use of hydropower and the inability of consumers to pay high transportation costs lead to the lowest greenhouse gas emissions in Central Asia. Recently, however, the use of coal for power generation has experienced noticeable growth, as have cement production and other industries. These developments have the potential to increase carbon emission and hinder potential mitigation efforts by locking in reliance on coal technologies.

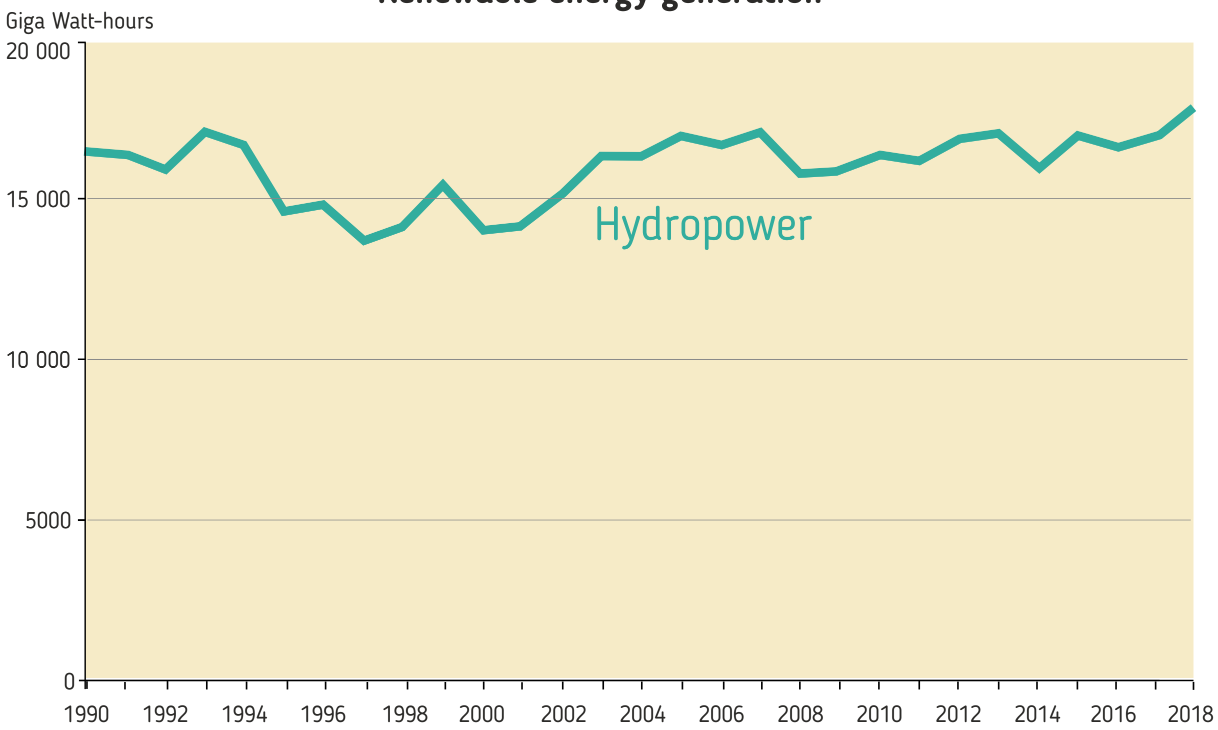
Tajikistan

Total primary energy supply

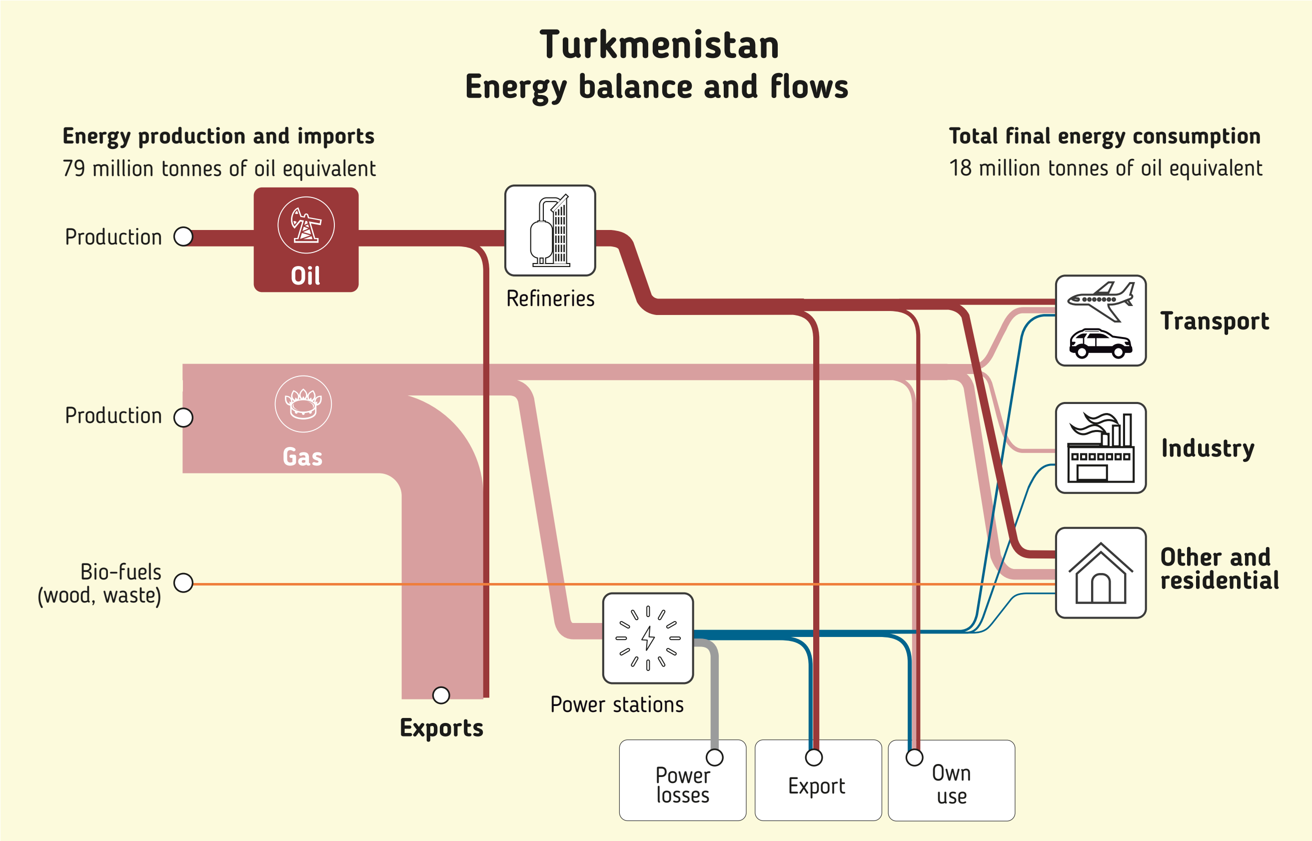


Source: International Energy Agency (IEA, www.iea.org), country profiles

Renewable energy generation



Source: International Energy Agency (IEA, www.iea.org), country profiles

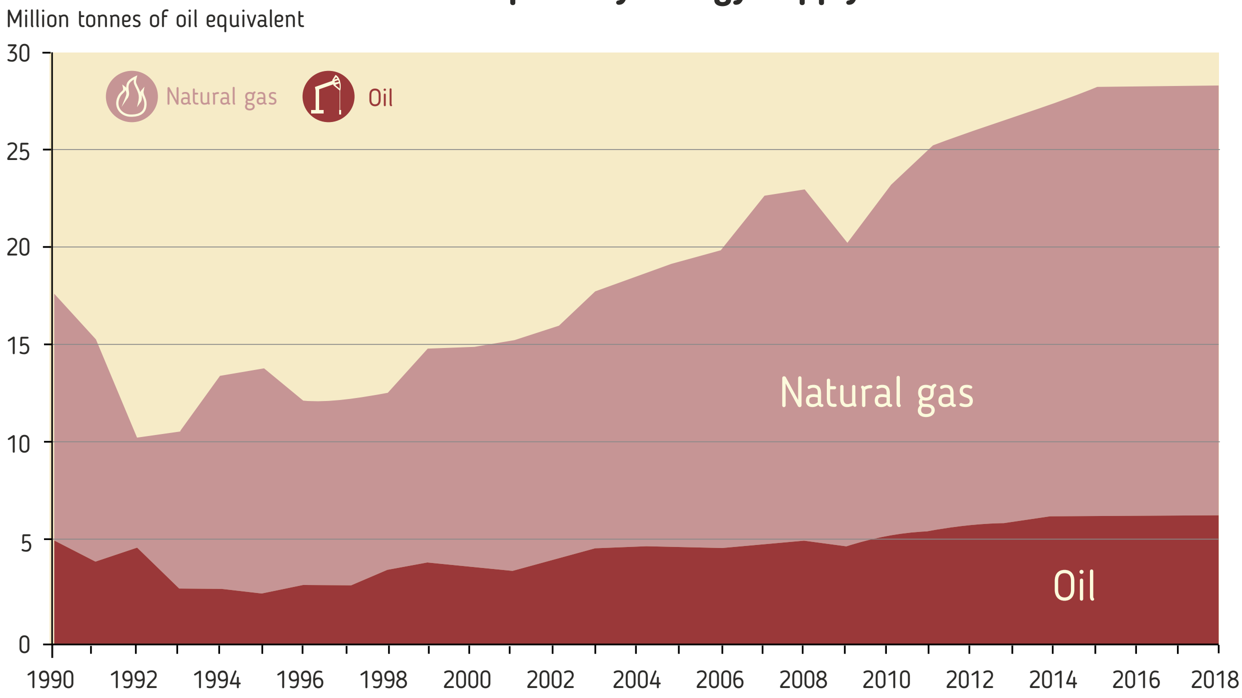


Source: International Energy Agency, data for 2018 (Sankey flow diagramme, simplified)

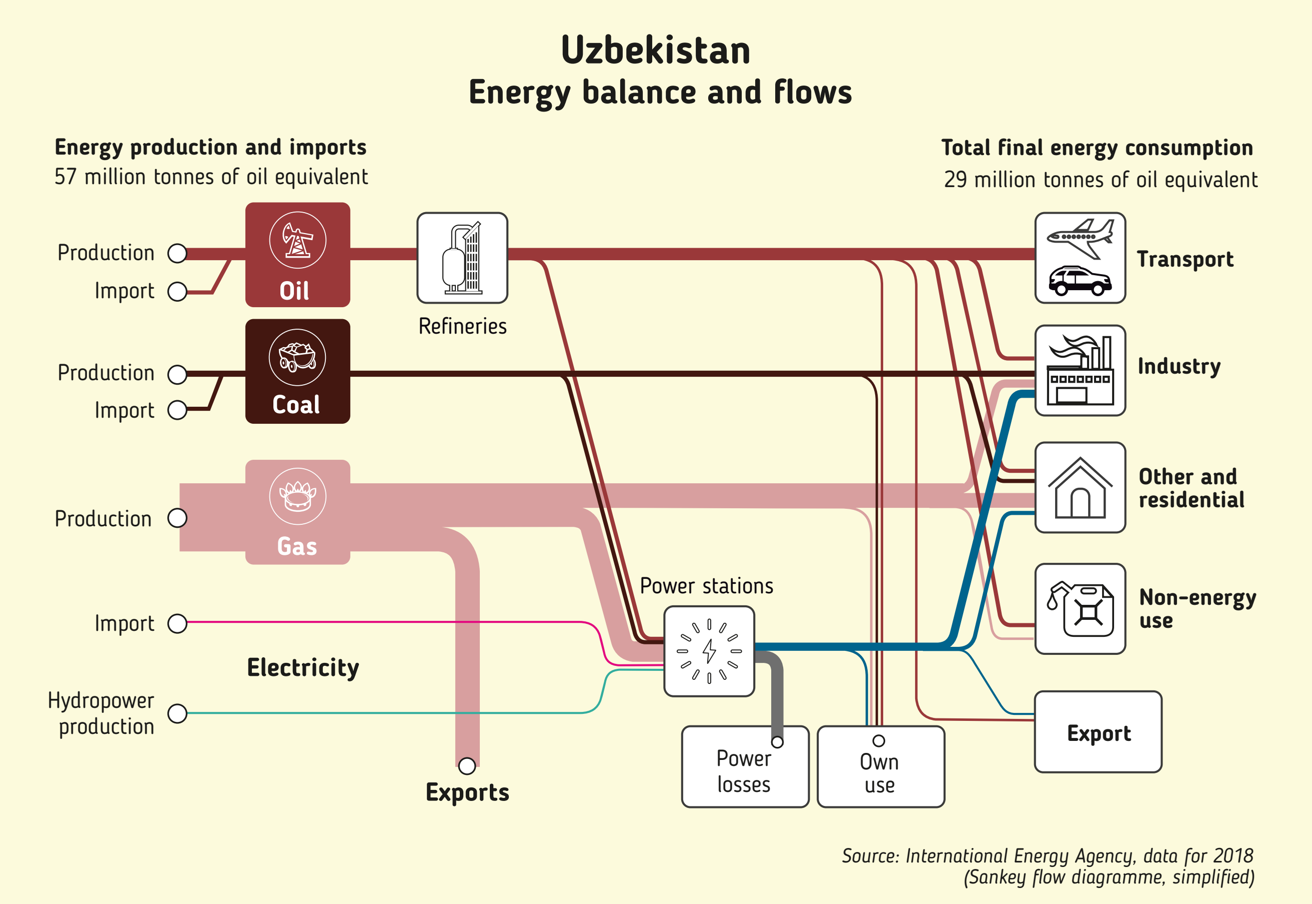
Turkmenistan is the region's largest producer of natural gas, but faces technical and geopolitical limitations on exports. Currently, a major destination for gas exports is China, but the country aims to expand its market by building a pipeline to Pakistan and India via Afghanistan. Turkmenistan's oil production is concentrated offshore in the Caspian Sea. It has the highest level of gasification in Central Asia, but almost no renewables.

Its high per capita emissions is due to its low population and high levels of gas production and the attendant leaks throughout the process. These current practices limit the country's ability to make emission commitments, but Turkmenistan is taking climate change seriously and has adopted an adaptation strategy. Its domestic investments to energy efficiency, environmental protection and water resources conservation are significant.

Turkmenistan
Total primary energy supply

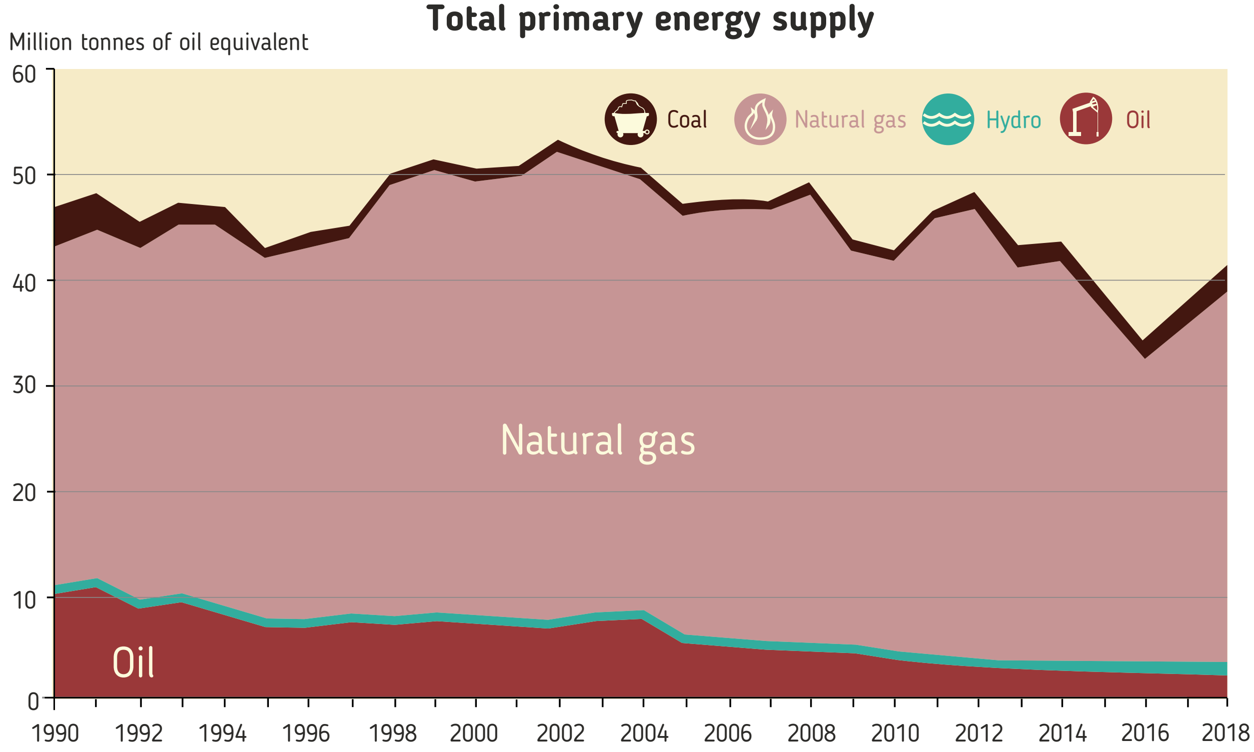


Source: International Energy Agency (IEA, www.iea.org), country profiles



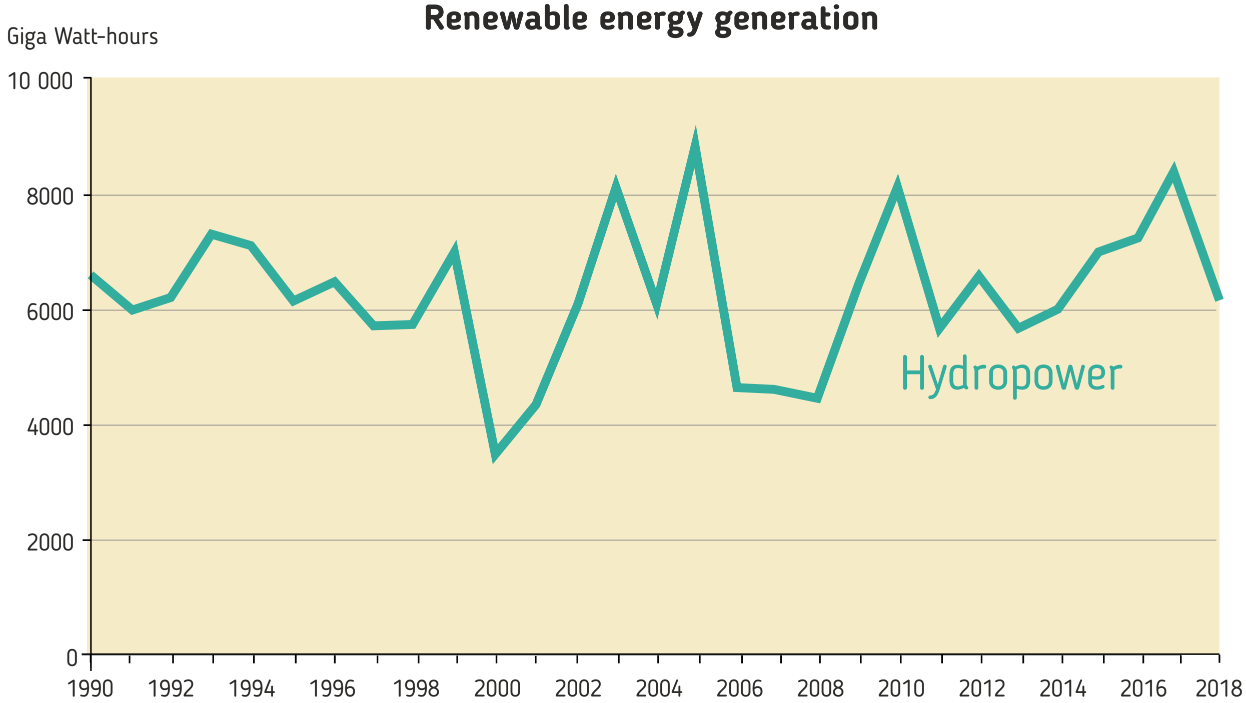
Uzbekistan's diversified energy sources include significant production of gas — most of which is used domestically — and uranium, and the country plans to build a nuclear power plant with Russia between 2020 and 2030. Considerable energy efficiency measures and the use of less carbon intense energy sources have contributed to a decline in energy-related emissions. A significant share of cars now run on natural gas and the country plans to further expand its renewable energy sources, despite planned increases in coal production and use.

Uzbekistan
Total primary energy supply



Source: International Energy Agency (IEA, www.iea.org), country profiles

Renewable energy generation



Source: International Energy Agency (IEA, www.iea.org), country profiles

6. Country profiles

Kazakhstan

Kazakhstan is the largest country of Central Asia and is the region's largest emitter of greenhouse gases. Its emissions in 2018 amounted to 396 million tonnes in CO_2-equivalent, approaching its 1990 peak emission level, with energy production remaining a key contributor to high carbon emissions. Kazakhstan recognizes its large carbon footprint and coal dependency and is taking steps to increase the share of renewables in the energy balance, to expand its carbon emission trading system and to increase gasification. Kazakhstan recognizes its vulnerabilities to threats from floods, droughts, crop failures and melting glaciers, and in response is modernizing the national hydrometeorological network, improving agricultural practices and making food production more resilient to climate change.

Climate impacts

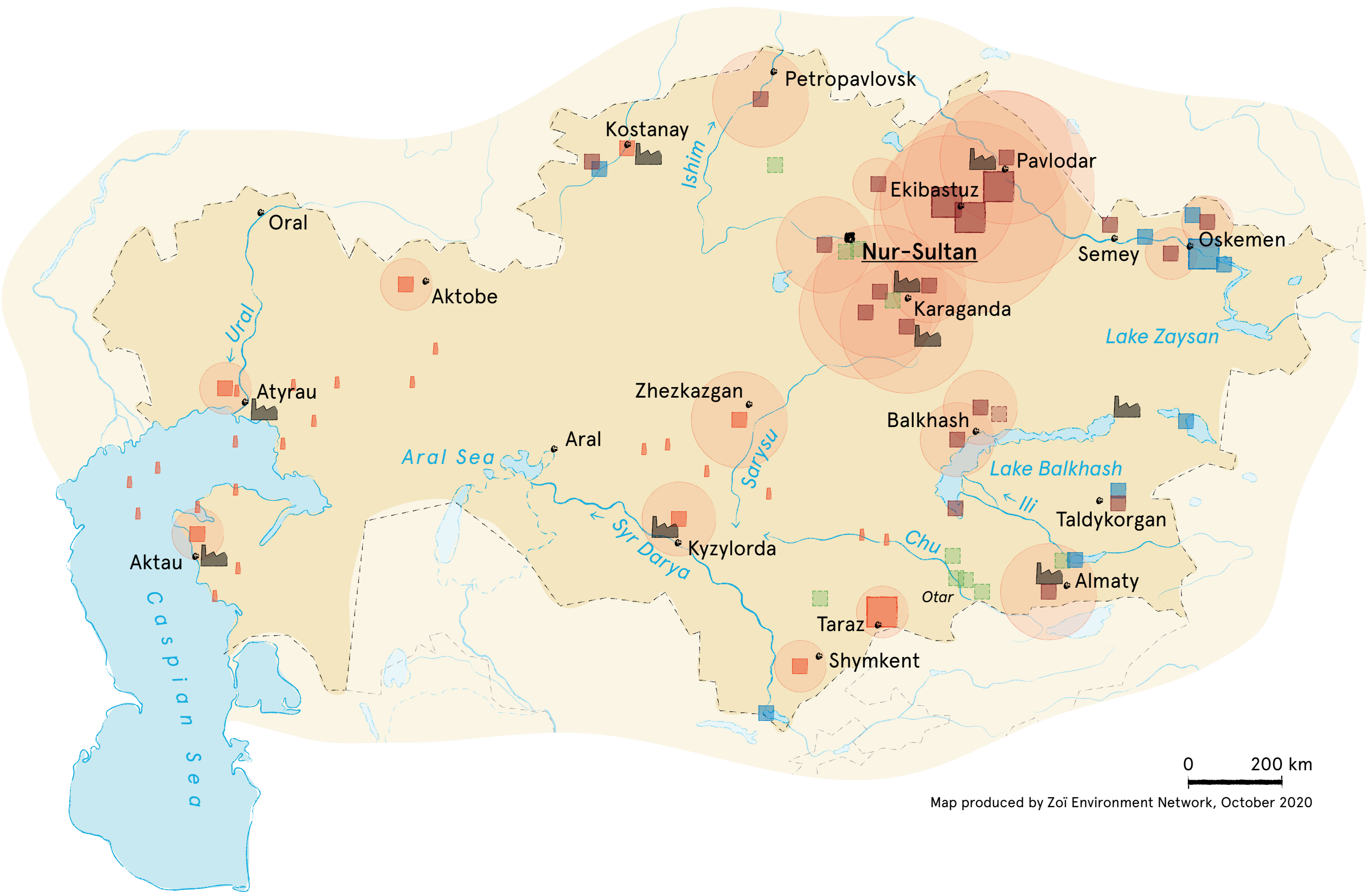
Rivers with intense cross-border water use and increased stress from climatic and hydrological changes

Major food producing and populated areas: risk of extreme weather impact on people and food security

Caspian Sea: risk of flooding due to sea level fluctuation and changes in winter ice cover

Mountain hazards, reduction of ice cover and risk of glacial lakes outburst floods

Heatwaves, droughts, floods and wildfires in Kazakhstan have inflicted significant economic losses over the last years, especially in the northern grain producing parts of the country. Climate change is placing greater stress on water resources, which may have negative consequences for the agriculture and energy sectors. Extreme weather events resulting from climate change have produced dramatic swings from record high to record low agricultural production. Northern and eastern provinces of Kazakhstan (as highlighted on the map) are considered most vulnerable to climate impacts. Other areas of impacts and concerns include the Altai and Tien Shan Mountains, including glaciers and glacial lakes, the northern Caspian Sea and coastline, the Balkhash Lake and the Ili River, and the Shu and Talas Rivers.



Energy and industry installations and carbon emissions

CO_2 emissions from thermal power plants, million tons per year:

more than 5
2 – 5
1 – 2
0.5 – 1
less than 0,5

Coal power plant, existing/projected

Gas power plant · Oil or gas production

Hydropower plant, existing/projected

Solar or wind power plant, projected, under construction or active

Major power plant (more than 1 GW capacity)

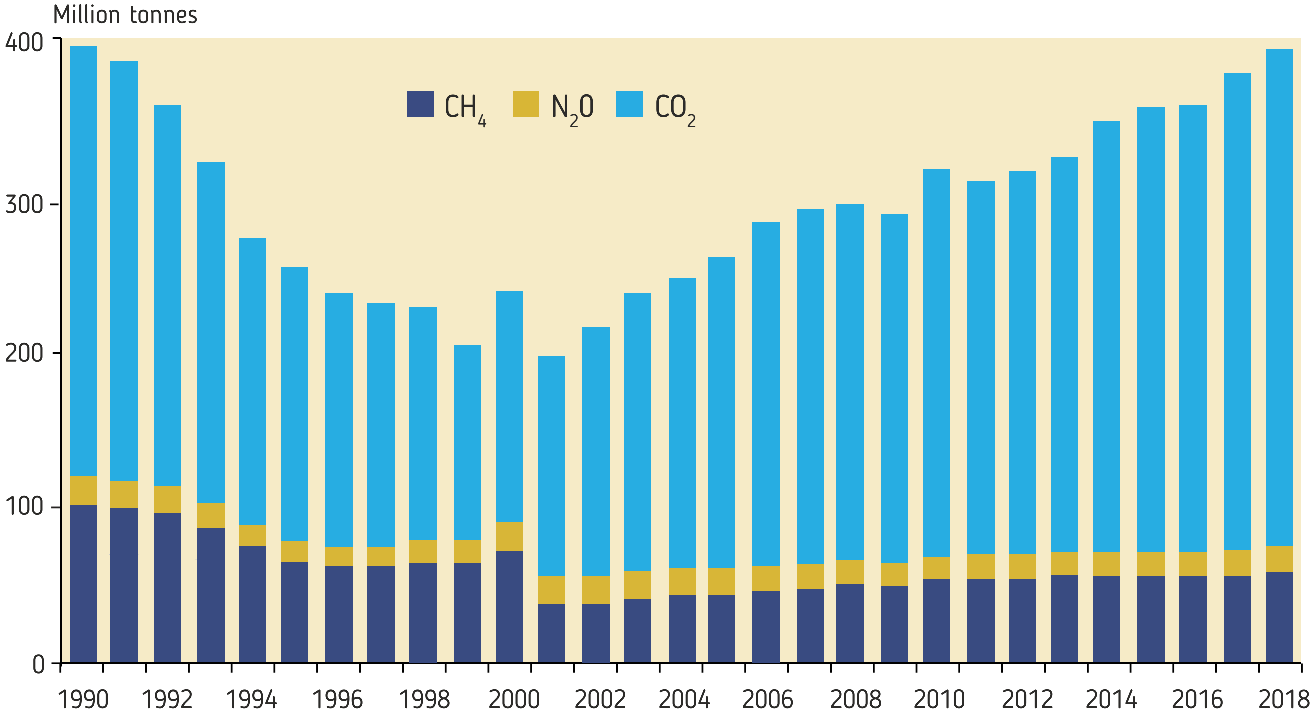
Major cement plants and other carbon-emitting industries

Kazakhstan intends to achieve an unconditional economy-wide target of 15 per cent reduction (staying below the baseline) in greenhouse gas emissions by 2030 compared to the 1990 baseline, or a 25 per cent reduction conditional on international support. It also aims to bring the share of new renewable energy in power generation to 10 per cent by 2030, and 50 percent by 2050.

In 2020, there were over 100 renewable energy installations with a total capacity of 1600 MW and in 2019 they produced 2.4 GWh of power. Kazakhstan is developing a National strategy for low carbon economic development until 2050 and is introducing best available techniques (BAT) as one of the key pillars of new Environmental Code.

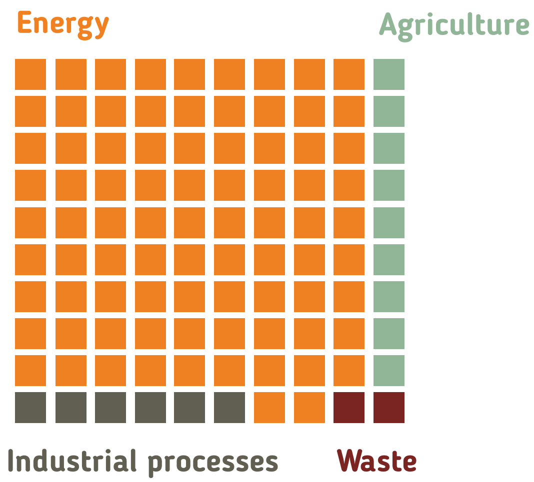
Kazakhstan

Greenhouse gas emissions

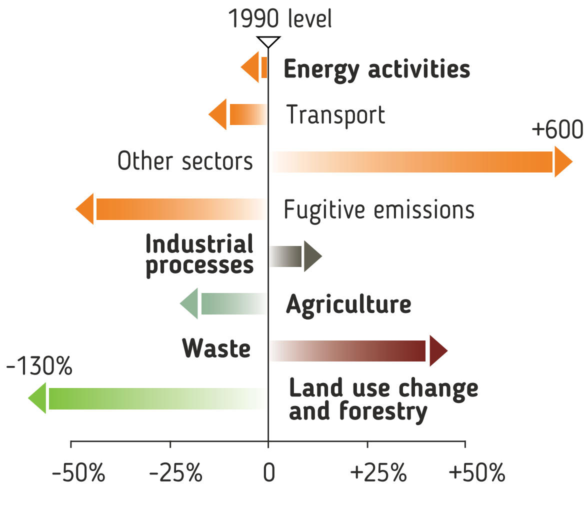


Summary of GHG emissions for Kazakhstan, UNFCCC

Greenhouse gas emissions by sector, 2018



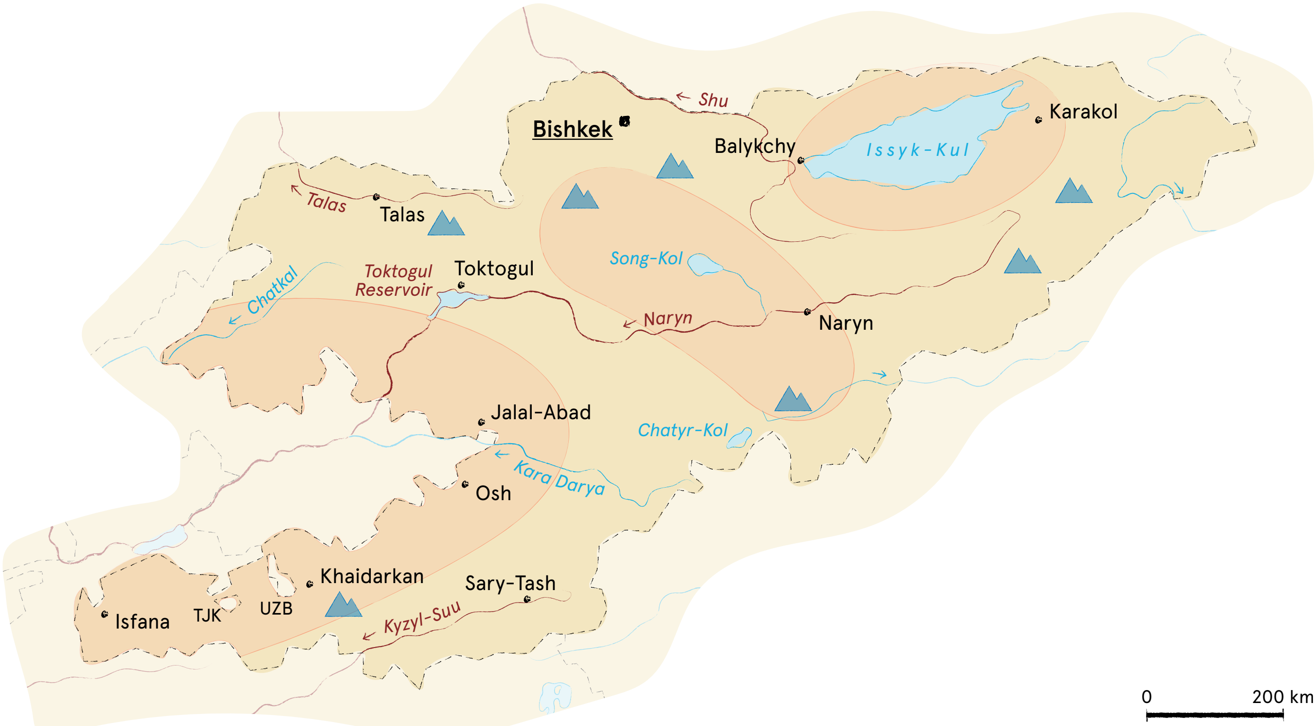
Greenhouse gas emission change from 1990 to 2018



Source: Summary of GHG emissions for Kazakhstan, UNFCCC

Kyrgyzstan

Numerous civil society organizations and international partners are supporting Kyrgyzstan in the design and implementation of adaptation measures, and a governmental commission and climate finance center are working to increase the scale of climate actions. Domestic financial institutions are making climate adaptation and energy efficiency micro-loans, and policymakers are considering climate impacts in water and energy management, land use and mining. Kyrgyzstan's emissions in 2010 amounted to 12 million tonnes in CO_2-equivalent, a 55 per cent reduction from the 1990 peak level mainly due to significant reductions in fossil fuel use and a decline in industry after the breakup of the Soviet Union. Low total and per capita emissions are linked to the prominent role of hydropower in country's energy balance.



Map produced by Zoï Environment Network, October 2020

Climate impacts

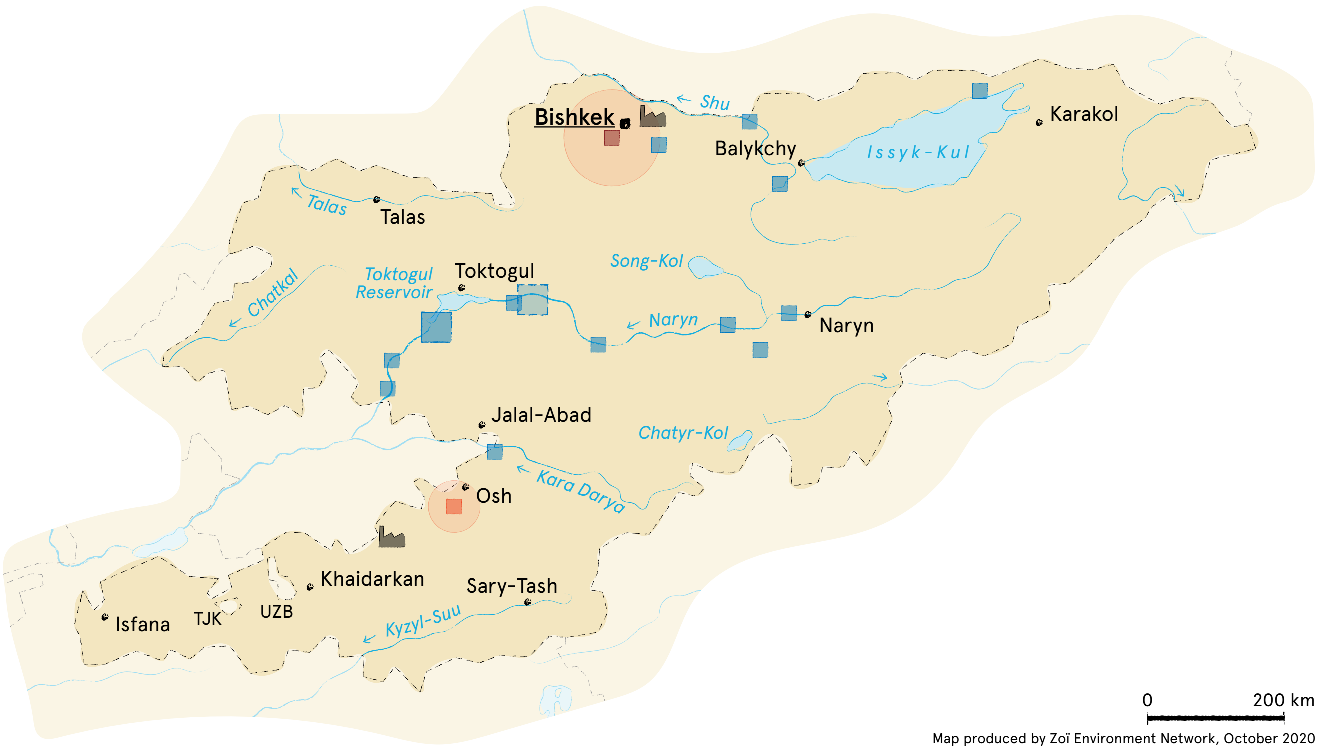
Rivers with intensive cross-border water use and increased stress from climatic and hydrological changes

Areas most exposed to weather and climate risks; environmentally sensitive and stressed regions

Mountain hazards, reduction of ice cover and risk of glacial lakes outburst floods

Climate change is disrupting important economic sectors in the Kyrgyz Republic — water resources, agriculture and energy — and is threatening biodiversity. Adaptation is therefore a priority.

In making every effort to ensure that these initiatives are successful, the Kyrgyz Republic has incorporated actions on climate change into its national sustainable development strategy and its programme for making the transition to sustainable development. A similar document guides the approach to adaptation, and the country has developed plans and programmes for adaptation in all vulnerable sectors as well as climate risk profile. The Climate Change Coordination Commission comprises the heads of all key ministries and divisions, as well as representatives of the civil, academic and business sectors, and coordinates climate change activities in the Kyrgyz Republic.



Energy and industry installations and carbon emissions

CO_2 emissions from thermal power plants, million tons per year:

1 — 2
0.5 — 1
less than 0,5

Coal power plant

Gas power plant

Hydropower plant

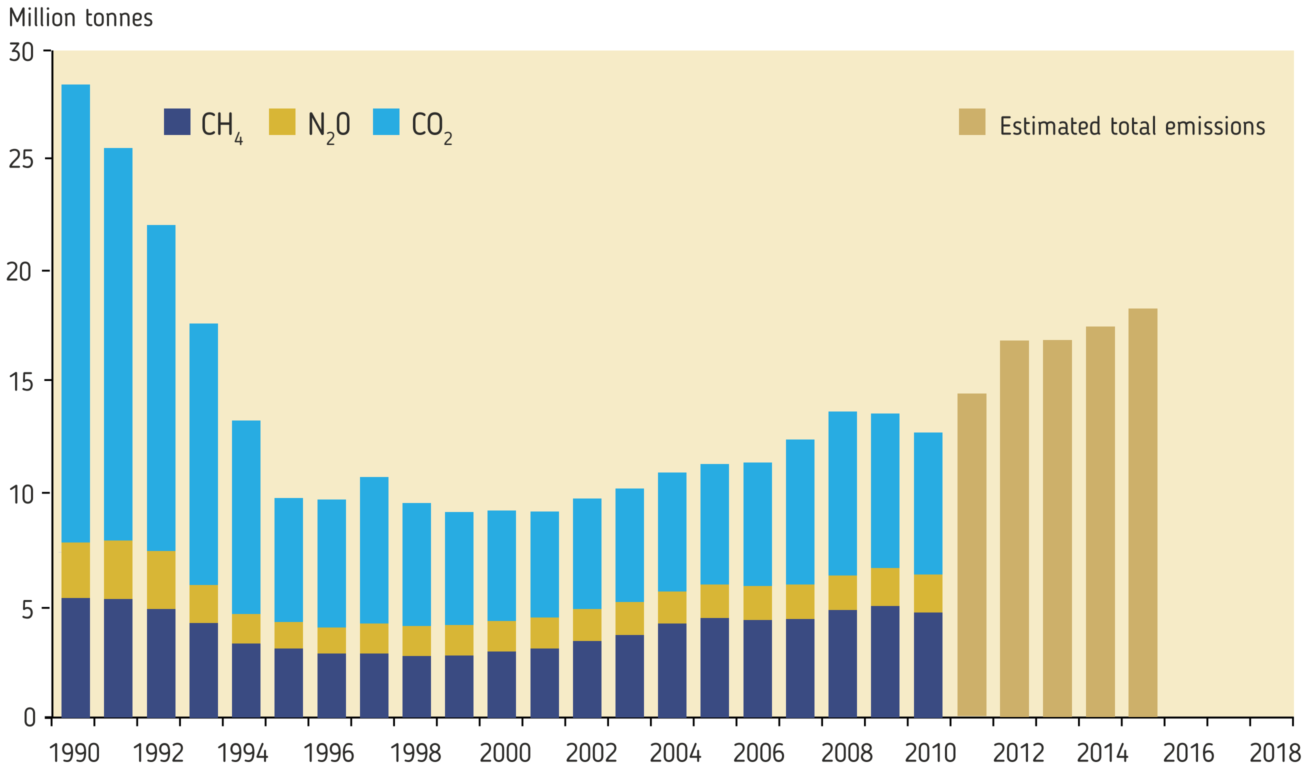
Major power plant (more than 1 GW capacity)

Major cement plants and other carbon-emitting industries

The Kyrgyz Republic contribution to global greenhouse gases emissions is relatively low, but the country expects its planned economic development to lead to strong emission increases, and is taking measures to lower emissions — by an unconditional 11—14 per cent below business-as-usual levels by 2030 and an additional 30 per cent conditioned on international support.

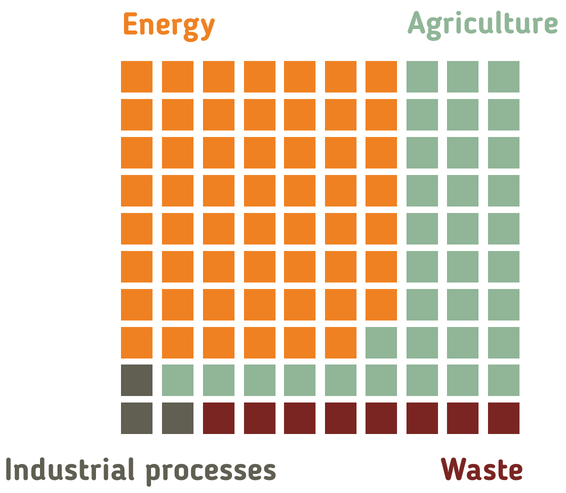
Kyrgyzstan

Greenhouse gas emissions

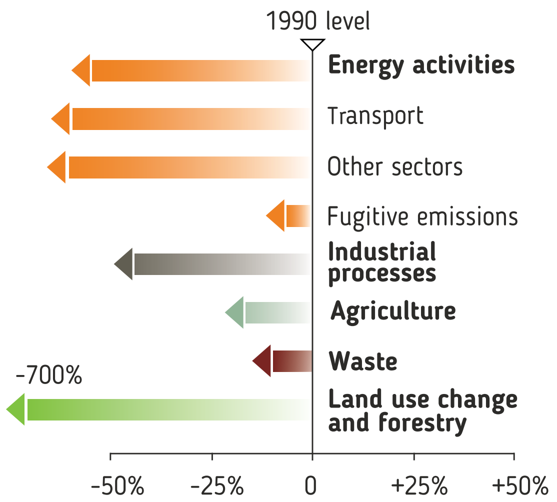


Sources: Summary of GHG emissions for Kyrgyzstan, UNFCCC (data 1990-2010) and estimates based on EDGAR (data 2011-2015)

Greenhouse gas emissions by sector, 2010



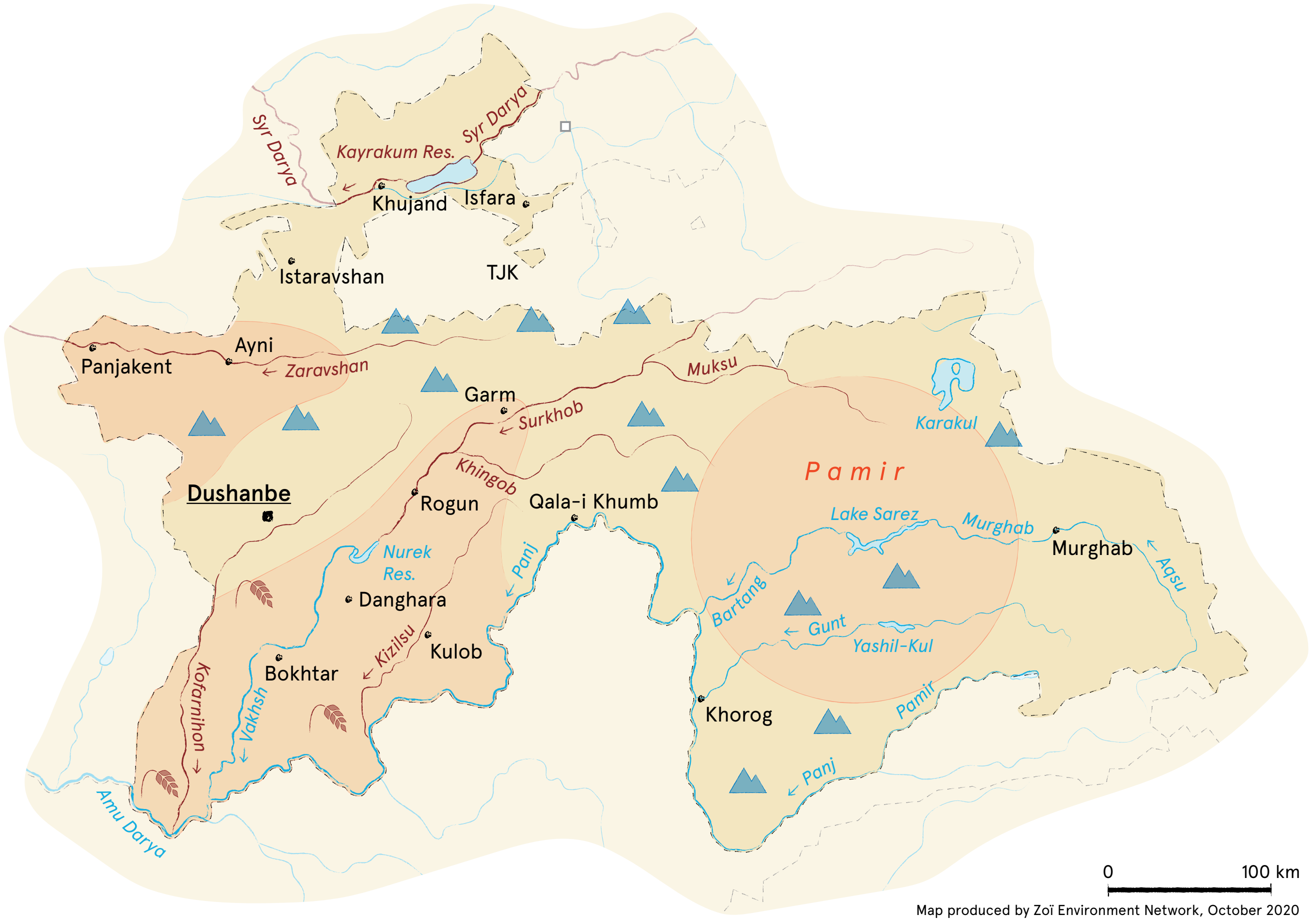
Greenhouse gas emission change from 1990 to 2010



Source: Summary of GHG emissions for Kyrgyzstan, UNFCCC

Tajikistan

Tajikistan ranks high on global climate vulnerability lists. While its high reliance on hydropower makes Tajikistan a leader in low-carbon development, it also increases vulnerability to climate impacts on water resources. Tajikistan's 2014 emissions were 9 million tonnes in CO_2-equivalent — much lower than the country's peak emissions of 24 million tonnes in 1990 — but the recent introduction of the coal power and cement plants are likely to increase emissions. Ongoing construction of the Rogun hydropower plant, however, will nearly double its clean energy potential and open the possibility of exporting energy. Tajikistan's climate adaptation projects range from household-level greenhouses to community-level disaster risk reduction and recovery initiatives to modernization of hydropower and the hydrometeorological observation system.



Climate impacts

Rivers with intense water use and increased stress from climatic and hydrological changes

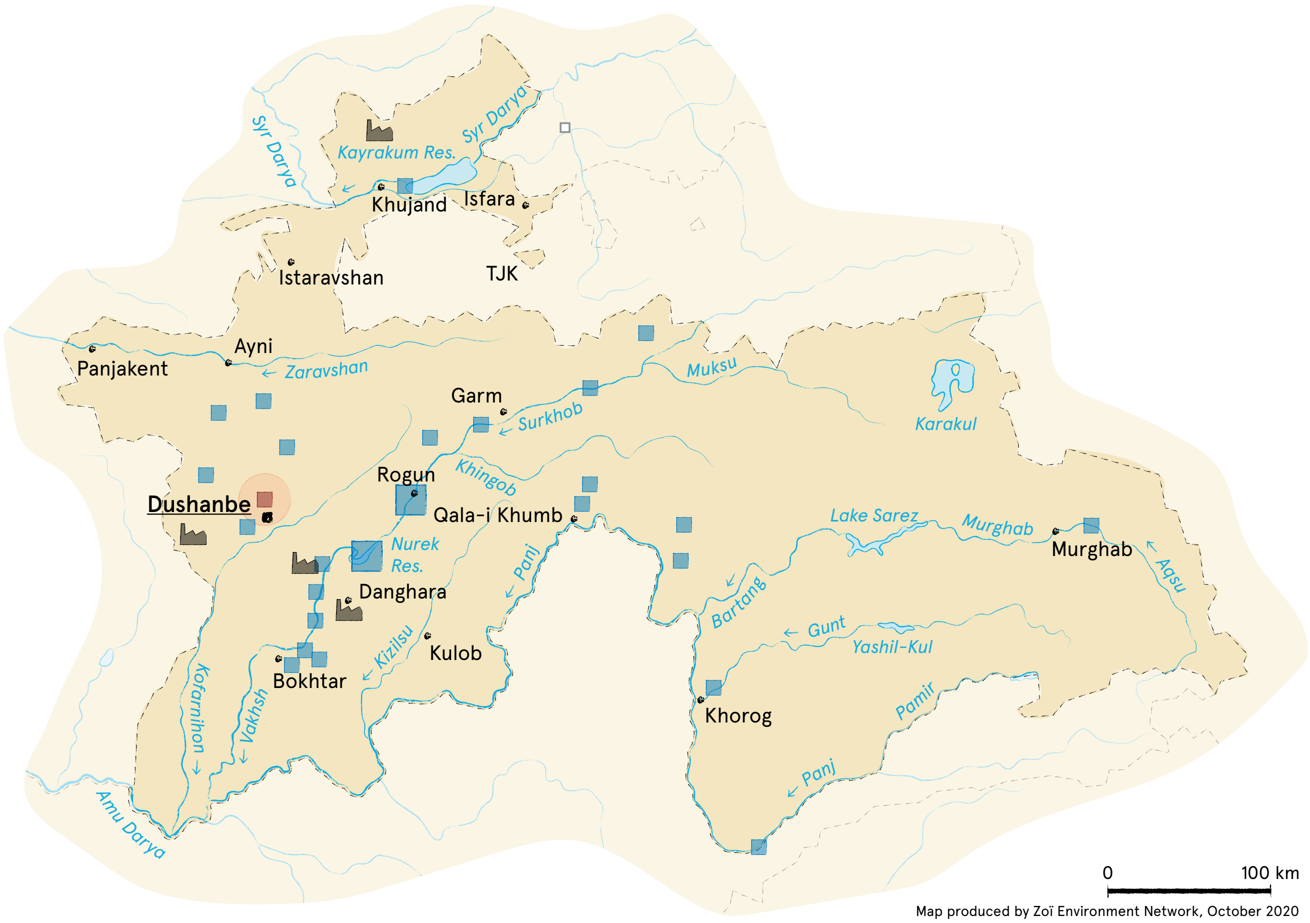
Areas most exposed to weather and climate risks; environmentally sensitive and stressed regions

Mountain hazards, reduction of ice cover and risk of glacial lakes outburst floods

Severe drought impacts

A national adaptation strategy is in place, and programmes, strategies and legislative instruments to meet the targets include measures for developing renewable sources of energy, energy saving and energy efficiency, reforming agriculture, modernizing industry and transport, developing forestry and land use planning.

Tajikistan's approach to adaptation is to reduce vulnerability by means of full-scale integration of climate resilience and adaptation measures into the planning and development of infrastructure in agriculture, energy (hydropower), transport and housing. Areas of policy attention and actions include hydrometeorological hazards and disaster risk reduction, globally significant biological species and ecosystems, glaciers and water resources, and public health.



Energy and industry installations and carbon emissions

CO_2 emissions from thermal power plants, million tons per year:

0.5 — 1
less than 0,5

Coal power plant

Hydropower plant

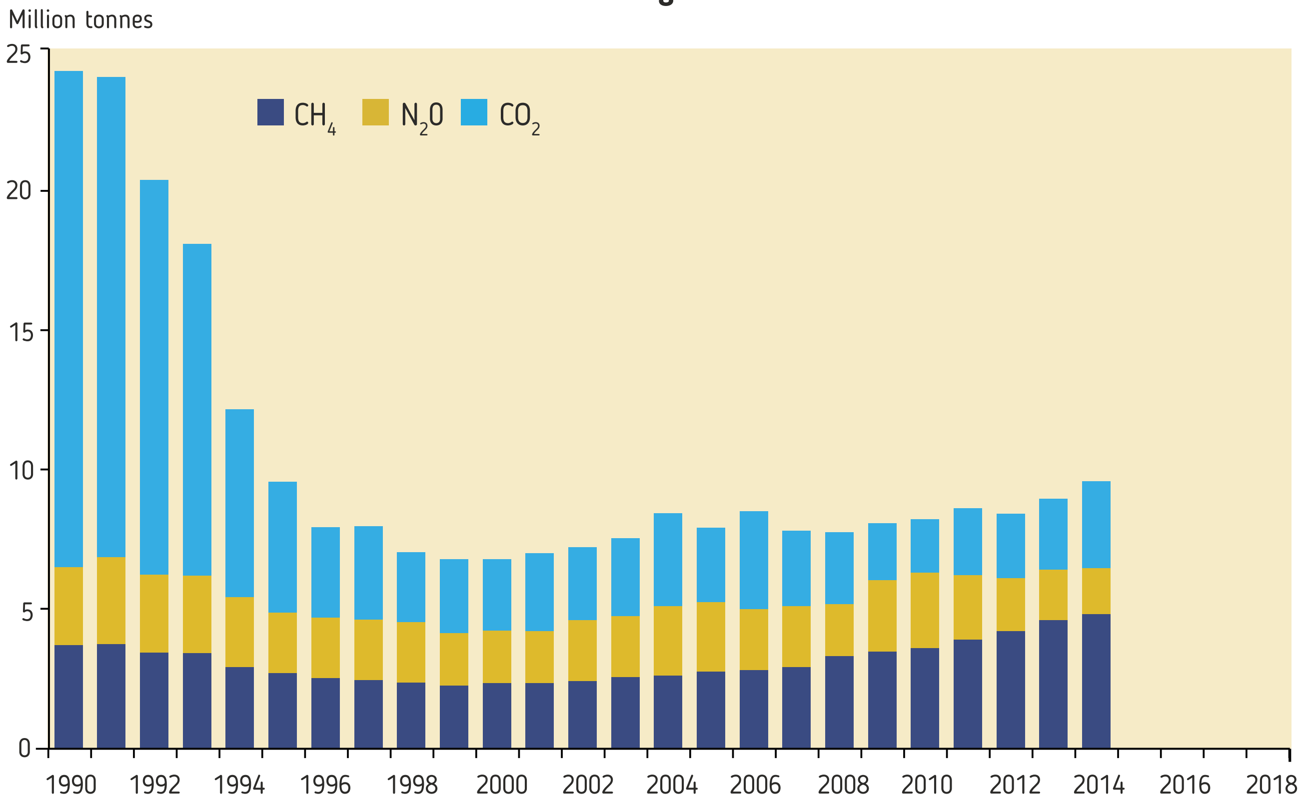
Major power plant (more than 1 GW capacity)

Major cement plants and other carbon-emitting industries

The melting of glaciers and the disruption of water resources bring serious consequences to Tajikistan's hydropower industry and the agricultural sector across the region. As a country with high vulnerability to climate change and with the lowest emissions in the region, Tajikistan emphasizes adaptation, but nevertheless pledges unconditionally that its emissions will not exceed 80—90 per cent of its 1990 levels by 2030. Its conditional target is that emissions will not exceed 65—70 per cent of its 1990 levels by 2030, subject to international funding to renewable energy sources, improved industrial processes, agriculture and waste reforms.

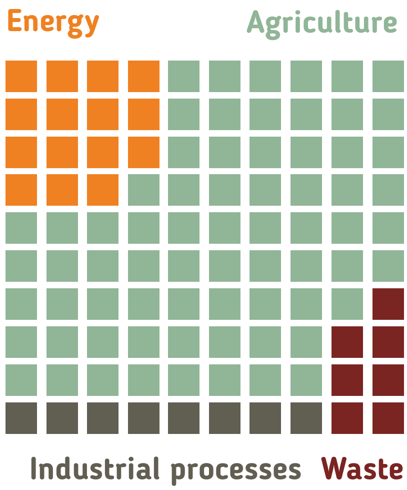
Tajikistan

Greenhouse gas emissions

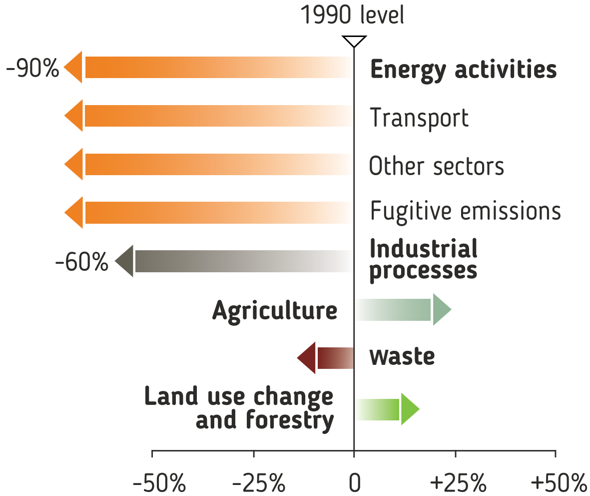


Sources: Summary of GHG emissions for Tajikistan UNFCCC (data 1990-2010), and the Biannual update report BUR (2011-2014)

Greenhouse gas emissions by sector, 2010



Greenhouse gas emission change from 1990 to 2010



Source: Summary of GHG emissions for Tajikistan, UNFCCC

Turkmenistan

As the country with the most exposure to high temperatures in Central Asia, Turkmenistan recognizes its vulnerability to water insecurity, and has taken a number of policy and technical steps to modernize urban and energy infrastructure and agriculture. Its emissions in 2010 were 66 million tonnes in CO_2-equivalent. Over the past 10–15 years Turkmenistan's emissions grew in tandem with expansion of the production of natural gas, the major fuel for the national economy and a major export, with China currently a key importer. Turkmenistan is investing domestic resources in mitigation of the Aral Sea crisis, and in afforestation, water and agricultural reforms and improvements in early warnings and weather forecasts.

Map produced by Zoï Environment Network, October 2020

Climate impacts

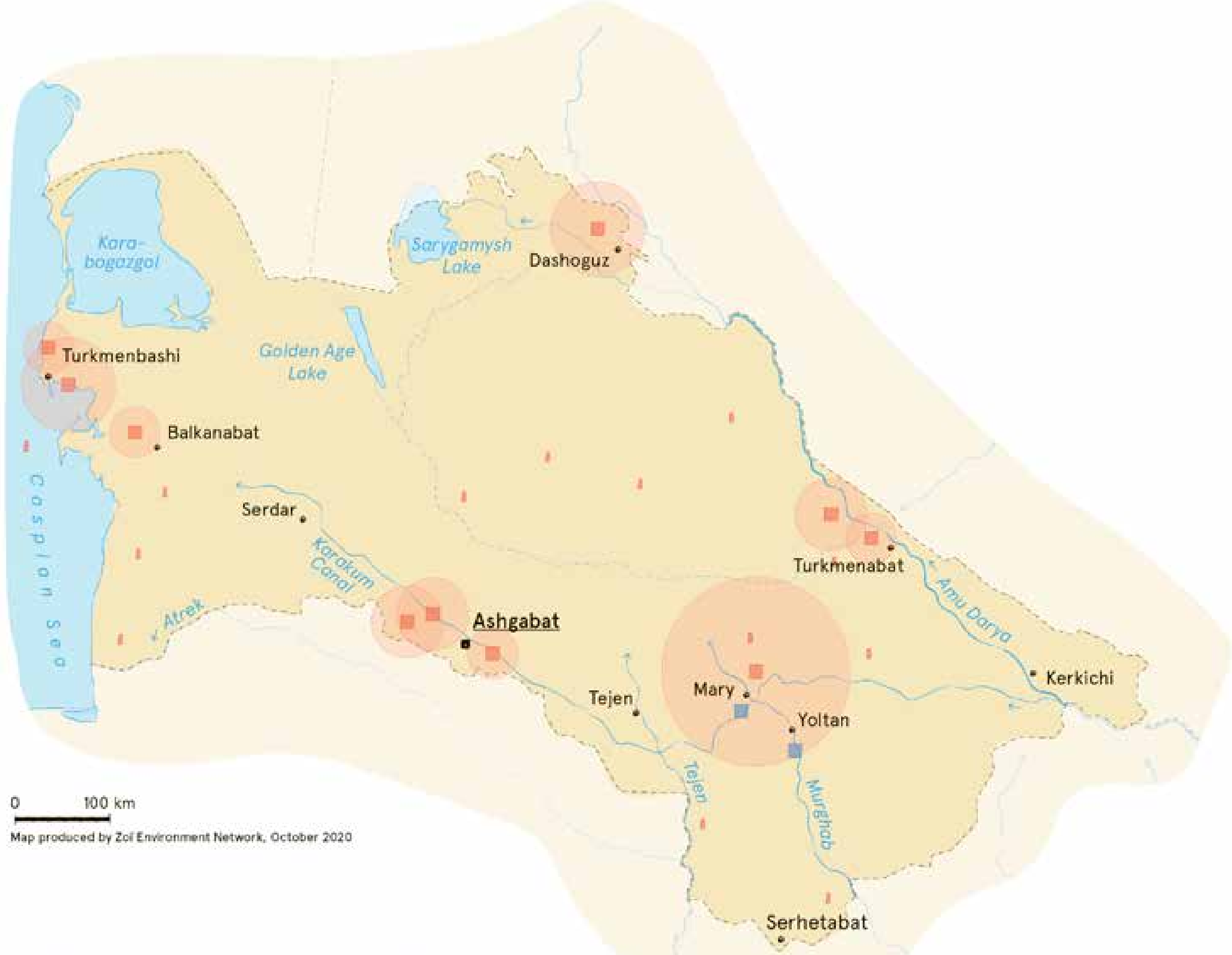
Rivers with intense water use and increased stress from climatic and hydrological changes

Risk of flooding due to storm surges and sea level fluctuations

Densely populated and agriculturally important areas with increased environmental stress and projected impacts of climate change

Increased heat stress and impacts on human health

Turkmenistan is among the most affected by climate change countries in Central Asia. Since the 1950s, Turkmenistan has experienced temperature increases of about 0.2 °C per decade on average. It is the southernmost country with soaring summer temperatures, high reliance on external water supply and extensive irrigated agriculture. Under unfavorable climate change conditions, the country may experience a shortage of water resources, increased desertification and land degradation, and an increase in the number of hazards leading to instability of agricultural production. This prospect would threaten food security and the well-being of the population. A major focus of the national strategy on climate change is adaptation. Turkmenistan intends to implement the national strategy through national and local actions that will support socioeconomic development.



Fossil fuel energy installations and carbon emissions

CO_2 emissions from thermal power plants, million tons per year:

2 – 5
1 – 2
0.5 – 1
less than 0.5

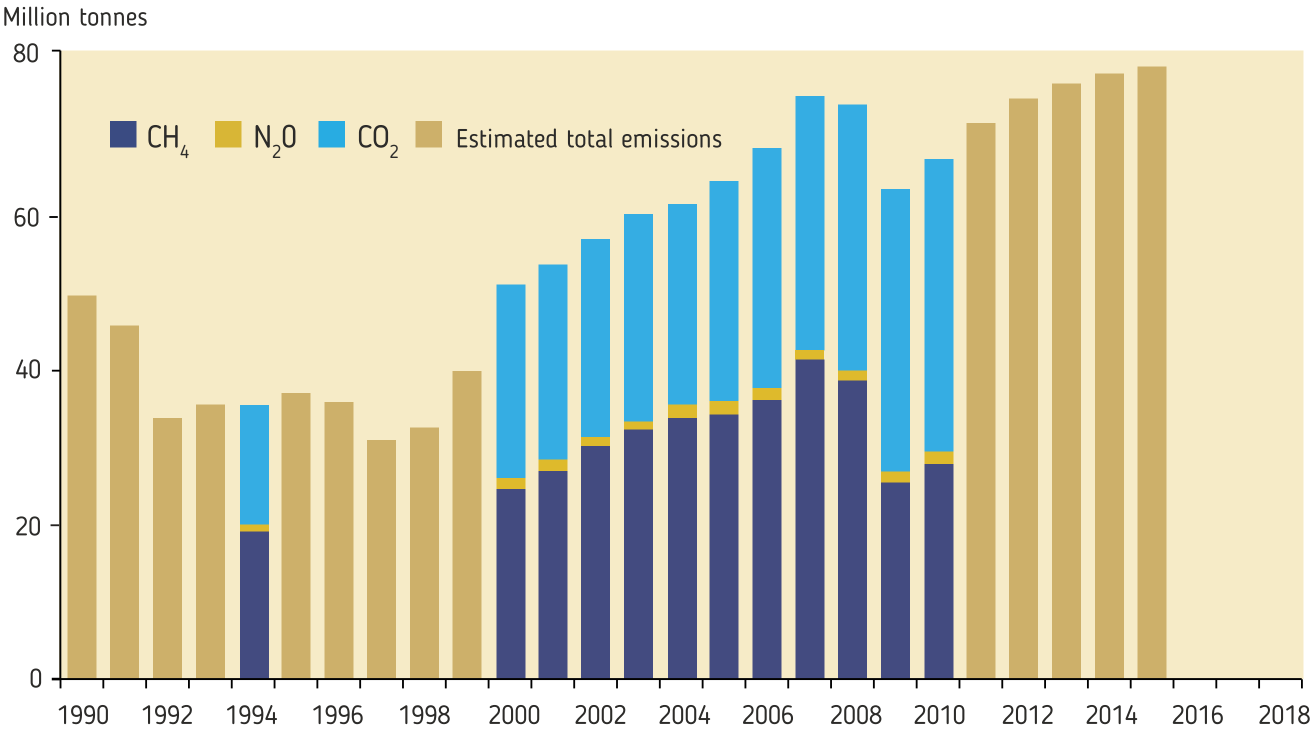
Gas power plant · Oil or gas production

Hydropower plant

Turkmenistan's efforts to address climate change are carried out in the context of implementation of a national strategy on climate change, a national strategy for socioeconomic development and a transition to low-carbon development. The country pledges unconditionally to keep the growth rate of emissions less than the growth rate of GDP (e.g. decoupling economic growth from emissions), with a conditional target of zero growth in emissions, and the possibility of achieving a reduction trajectory with international support. Turkmenistan policies support enhanced energy efficiency and resource savings in all key sectors, technological modernization, the use of renewable energy systems in remote and sparsely populated areas, the development of economic incentives and plans for a green economy.

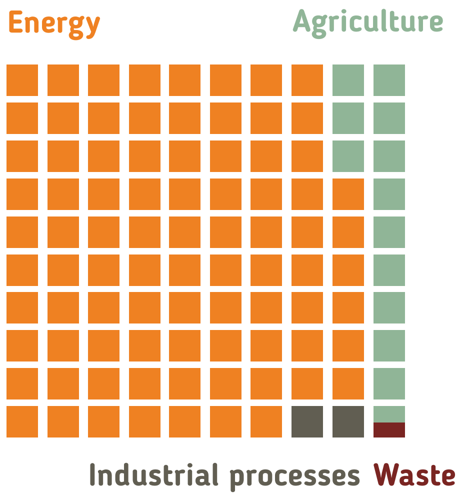
Turkmenistan

Greenhouse gas emissions

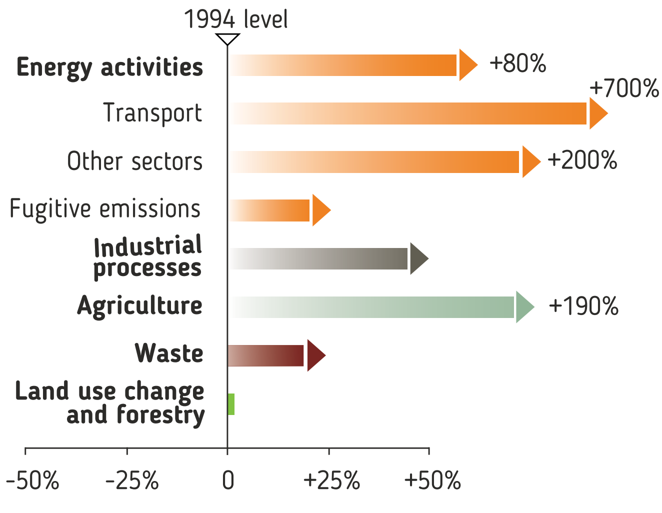


Sources: Summary of GHG emissions for Turkmenistan UNFCCC (data 1994, 2000-2010), and estimates based on EDGAR (2011-2015)

Greenhouse gas emissions by sector, 2010



Greenhouse gas emission change from 1994 to 2010



Source: Summary of GHG emissions for Turkmenistan, UNFCCC

Uzbekistan

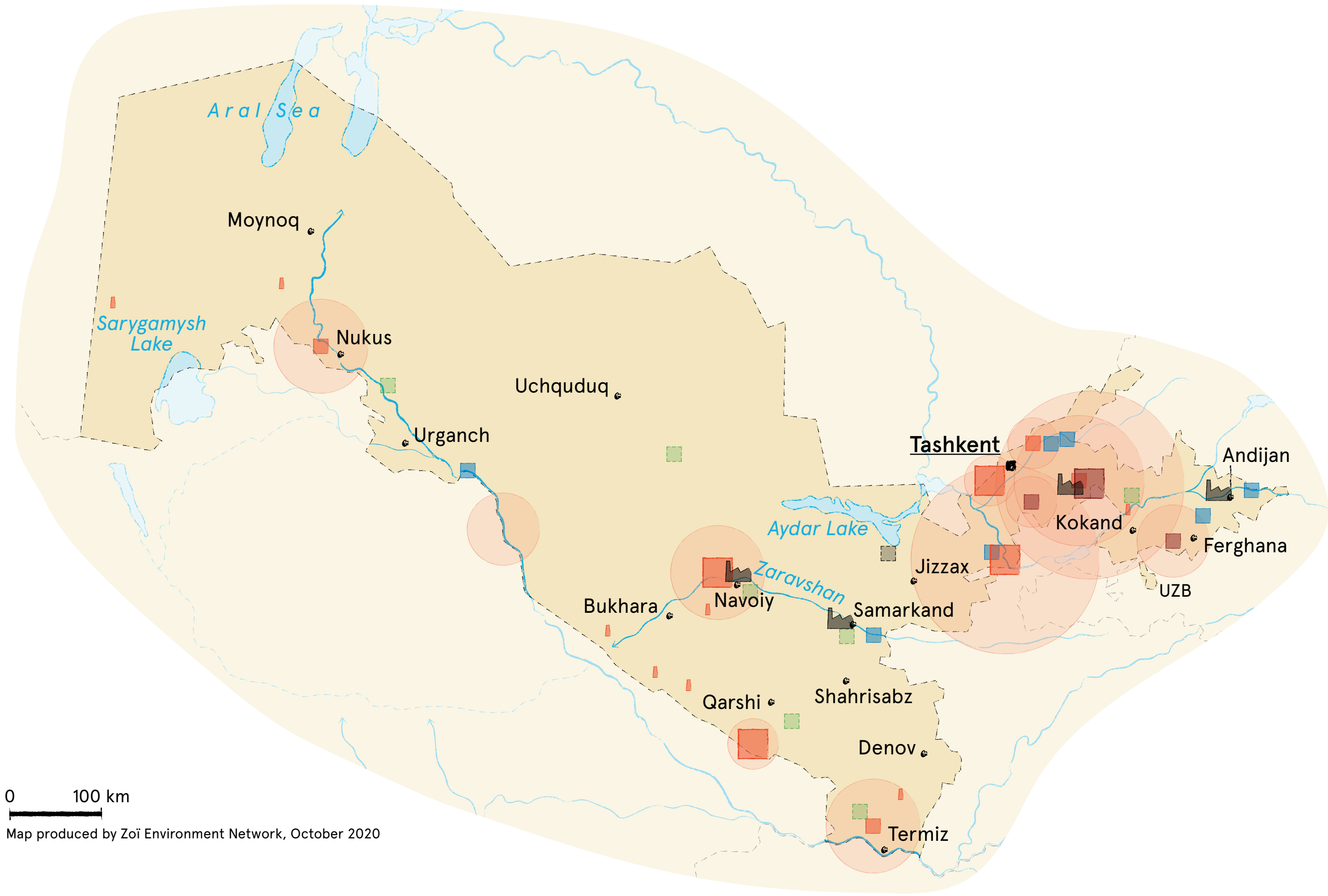
Uzbekistan is inviting international partners to invest in renewables, and its clean energy generation capacity is projected to double by 2030. Uzbekistan is a major producer of uranium, and is considering building a nuclear power plant to meet its growing energy demand. Housing standards are being adjusted for higher energy efficiency and improved resiliency to weather extremes. Most cars and power plants use natural gas. Uzbekistan's emissions remained relatively stable in the range of 170—220 million tonnes in CO_2-equivalent over the past 30 years, while the population increased. The country's vast irrigation network is in constant need of maintenance and upgrades. Many farmers are using water-saving technologies and greenhouses to grow food for domestic and export markets.

Climate impacts

- Rivers with intense water use and increased stress from climatic and hydrological changes
- Impact of regional climate change and dust storms due to shrinkage of the Aral Sea
- Increased risk of climate-related hazards in the mountains and impacts on populated areas and infrastructure
- Densely populated and agriculturally important areas with increased environmental stress and projected impacts of climate change
- Mountain hazards, reduction of ice cover and risk of glacial lakes outburst floods

Given high concentration of population and economic activities along rivers and inter-mountain areas, Uzbekistan is particularly vulnerable to climate change, and in the absence of additional measures, the country may face deficiencies in water resources and an increase in natural disasters, land degradation and heat stress impacts on agriculture and population. An increase in the frequency and intensity of droughts and heatwaves may lead to instability in agricultural production and threaten the country's food security.

Adaptation is a priority, and reaching Uzbekistan's goal to decrease its vulnerability to climate change and to ensure its sustainability will require targeted projects and programmes to be supported by assistance from international organizations.



Energy and industry installations and carbon emissions

CO_2 emissions from thermal power plants, million tons per year:

- more than 5
- 2 – 5
- 1 – 2
- 0.5 – 1
- less than 0,5

Coal power plant

Gas power plant · Oil or gas production

Hydropower plant

Nuclear power plant, projected

Solar or wind power plant, projected, under construction or active

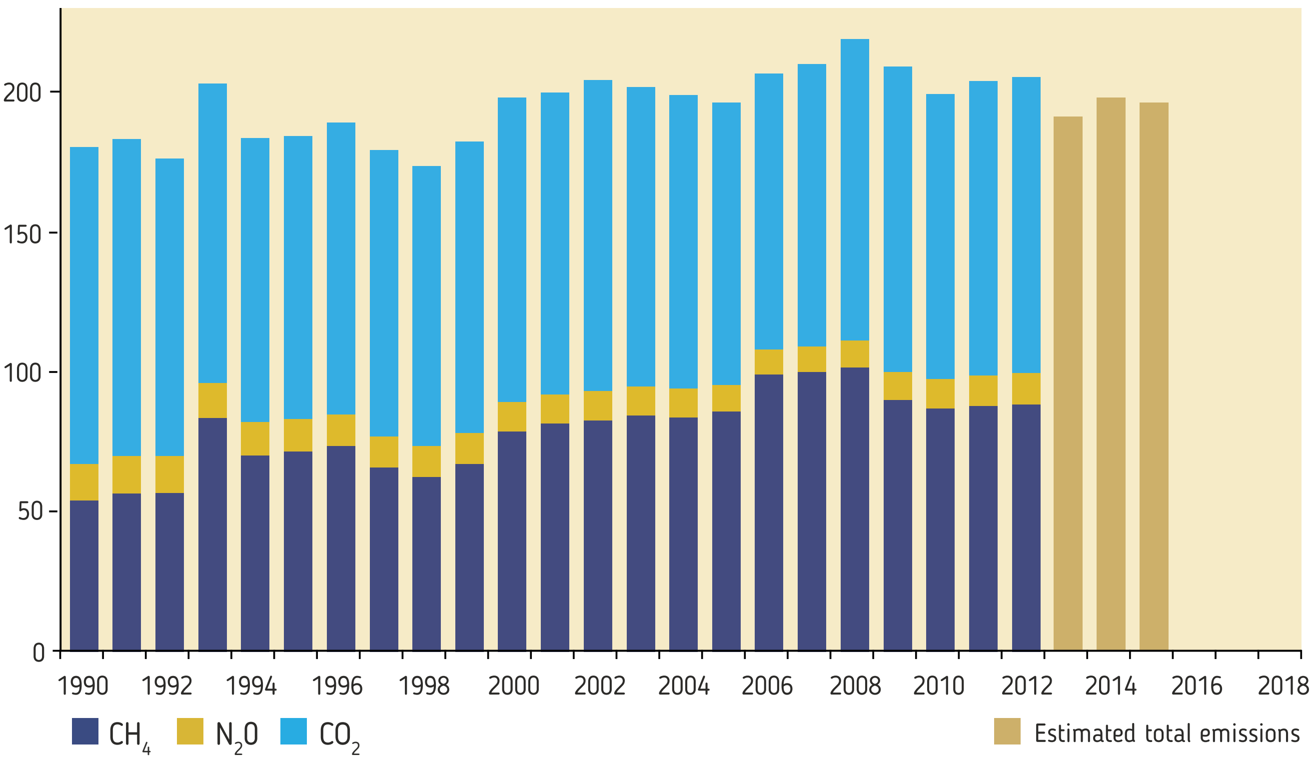
Major power plant (more than 1 GW capacity)

Major cement plants and other carbon-emitting industries

The country's mitigation objective is a 10 per cent reduction in emissions per unit of GDP by 2030 compared to 2010 levels, and calls for international support. The country has a developing economy and a stable annual GDP growth rate of 8 per cent. Uzbekistan's extensive legislation encompasses climate-related concerns in energy, construction, transport, water and agriculture programmes. In addition, its Vision 2030 provides a policy framework, and sets provisional goals for the reduction of the energy-intensity of GDP and for increasing the share or use of renewables, primarily solar power.

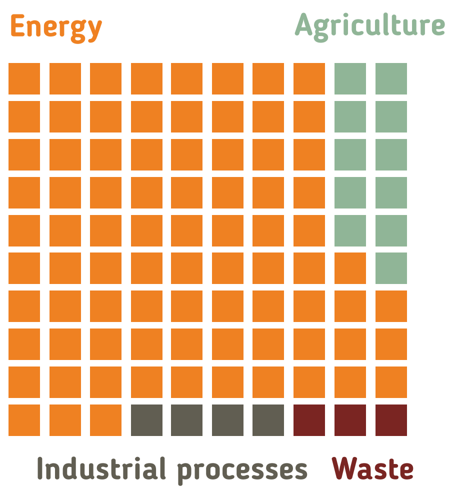
Uzbekistan

Greenhouse gas emissions

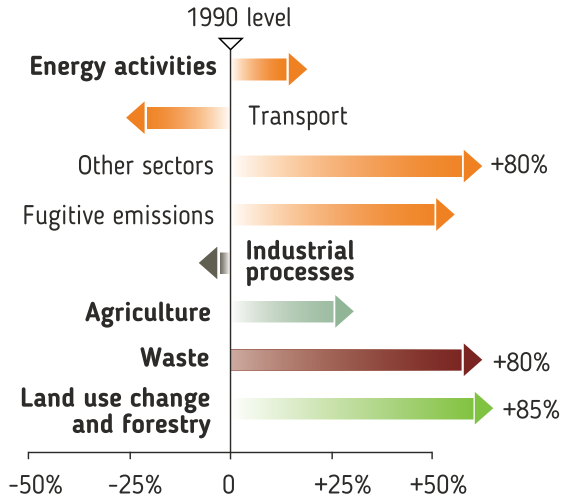


Sources: Summary of GHG emissions for Uzbekistan, UNFCCC (data 1990-2012) and estimates based on EDGAR (data 2013-2015)

Greenhouse gas emissions by sector, 2012



Greenhouse gas emission change from 1990 to 2012



Source: Summary of GHG emissions for Uzbekistan, UNFCCC

7. Regional cooperation and responses

The differences among the emission levels and profiles for the countries of Central Asia are striking. Tajikistan's total emissions, for example, are similar to carbon emissions from just one of several major coal power plants in central Kazakhstan. The countries' populations, geographies and energy mixes also vary, as do the sizes and energy intensities of their economies. On the other hand, they share a neighbourhood, have much in common culturally, enjoy a history of bilateral and regional cooperation and are connected by shared ecosystems and networks of rivers. And they all face climate challenges, some of which may lend themselves better to regional solutions than to national ones. The following examples provide a brief overview of regional cooperation.

Improved climate observations and weather forecasting

Recognizing threats from climate change and growing demands from economic sectors and the general public, all the countries of Central Asia are investing in improvements to their hydrometeorological services. In Tajikistan and Kyrgyzstan, donors provide significant support. In Uzbekistan, CAREC through a CAMP4ASB project added automated stations to the national network, and at the regional level supported development of new water and weather modelling tools, study tours and experience exchange. Another World Bank-funded regional project on hydromet modernization (CAHMP) is supporting countries in technical improvements at the field level, improving climate archives and data services, enhancing early warning capabilities and improving the accuracy of forecasts though modern numerical methods. Works-in-progress include improving early warning systems, short-term and seasonal forecasting and information exchange.

Better climate information exchange

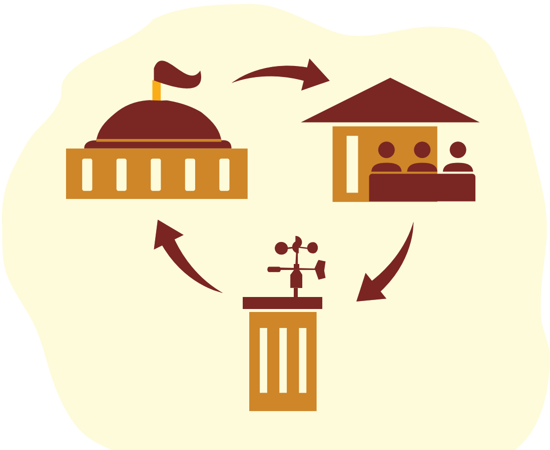
Hydromets are responding to user demand for climate information in digital formats — from learning and experience exchange platforms to scientific and real-time information on climate and weather, knowledge of climate adaptation tools and technologies. Under the CAMP4ASB project, CAREC has developed a regional climate information platform that supports users in many daily or planning activities. The World Bank through the Global Platform on Disaster Risk Reduction has produced and disseminated "A Guide to Hydrometeorological Services" in Central Asia. All services have websites and are making progress in user relations. There are plans for regional data exchange on the state of Central Asia's cryosphere, including monitoring climate change impacts on glaciers.

Enhanced climate resilience

Numerous smaller and larger projects have been recently implemented to introduce climate-resilient methods and technologies in Central Asia. Climate-focused loans support farmers in crop production, animal husbandry, beekeeping, the processing of dried fruits, water management, gardening and energy efficiency, and include the purchase of seedlings, seeds, fertilizers and materials. Methodologies and criteria for assessment of climate adaptation investments were designed and field-tested by CAREC in Tajikistan and Uzbekistan, and ministries of finance and micro-finance organizations can now use these tools in making their loan programmes climate smart.

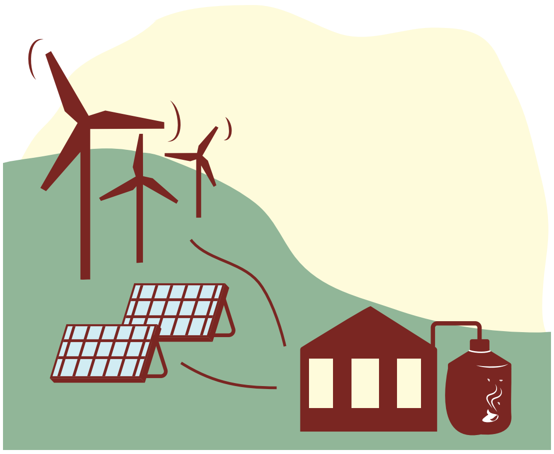
International outreach

Central Asia has had a low profile in IPCC assessment reports and at international climate conferences. On the request from the national delegations to the UNFCCC, CAREC jointly with other international partners has initiated regional work on enhancing the visibility of Central Asia, the development of a regional statement on climate change, and improving skills in dealing with complex climate negotiations. CAREC's accreditation with IPCC as an observer will open up prospects in scientific cooperation and will support the participation of Central Asia scientists in global assessments.



Support for decision-making

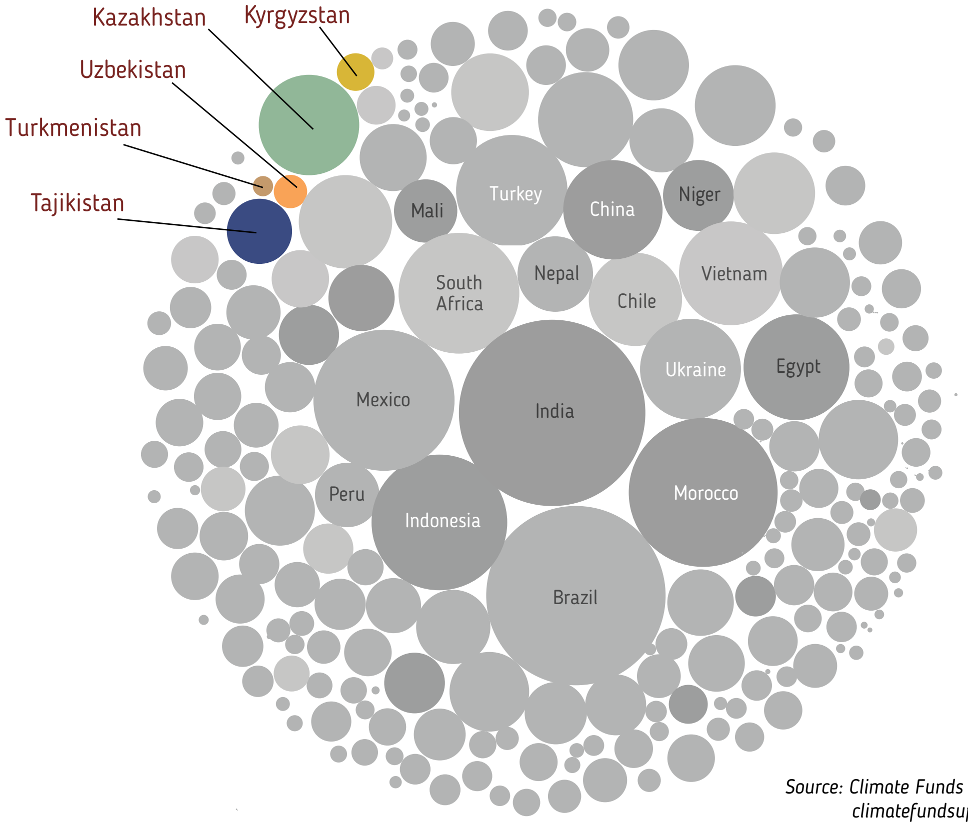
Groups of climate change stakeholders established three regional networks. An academic network unites national and international universities, professors and students to participate in courses and research programmes and to develop climate curricula. An NGO network collects ideas from civil society and supports local communities in low-cost and practical solutions to climate change. A network of parliamentarians and diplomats supports climate policy coherence, discusses trends and innovations and supports climate action through revisions in legislation and decision-making processes.



Clean energy and regional connectivity

In the Soviet era, Central Asia's energy systems were better integrated. With independence and new borders fragmentation increased. Power and gas supplies were often interrupted. The situation started to change with the recognition of benefits of clean energy production and exchange. CASA-1000, a multi-donor multi-country project, is a recent example of energy collaboration. Kazakhstan is experiencing a boom in renewable energy, and Uzbekistan is pursuing its high ambitions for renewables through numerous projects. NGOs are working at the community level with small-scale projects on solar and biogas energy. These developments at the local and national levels are complemented at the regional level by the Central Asia Water and Energy Programme (CAWEP). The World Bank and its CAWEP partners – the EU, Switzerland and the United Kingdom – work with governments, national and regional organizations, civil society organizations and development partners.

International climate financing



Source: Climate Funds Update climatefundsupdate.org

All the countries of Central Asia receive international climate financing, but the mechanisms and amounts vary significantly. Kazakhstan leads and most of its climate financing targets energy solutions. Tajikistan is the second and its climate financing targets climate resiliency measures. Kyrgyzstan with its climate investment strategy and projects is quickly catching up, while Uzbekistan is increasingly cooperating with international finance institutions on climate and solutions to the Aral Sea crisis. Turkmenistan is largely relying on its own finances to support climate adaptation and applies some international resources for innovations and demonstrations of climate-smart solutions in agriculture, water management and cities.

The International Fund for Saving the Aral Sea (IFAS), the oldest regional environmental fund of Central Asia is a formal high-level entity responsible for the CAMP4ASB programme. In the implementation of this programme, IFAS is supported by CAREC — an experienced regional organization with offices in all five countries, with rich international project experience, including under criteria of the World Bank and other donors. Other regional centres — specialized in water, glaciers or disasters — are open to climate projects and cooperation. The potential for future regional climate projects is promising, the history of cooperation is encouraging, and the mutual benefits for the individual countries and for the region at large are powerful incentives for the pursuit of ongoing bilateral and multilateral projects.

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page 11, map. Sources: Synthesized and simplified information based on the IPCC Fifth Assessment Report and IPCC Oceans and Cryosphere report, available at: ipcc.ch

page 12, graphic. Synthesized information from news reports: gazeta.uz, akipress.org, inform.kz, and CAWEP media digests

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