



# **NATIONAL REPORT ON THE STATE OF ENVIRONMENT OF THE KYRGYZ REPUBLIC FOR 2015-2018**

Short version



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According to the National Development Strategy of the Kyrgyz Republic for 2018-2040, improvement of environmental data management is a basis of enhancing of nature protection activity in order to have evidence-based formulation and implementation of the development plans, and environment-oriented decision making. In this relation, development and approval of the National Reports on the State of Environment of the Kyrgyz Republic is a part of implementation of the national policy on sustainable country development.

## KYRGYZSTAN IN THE GLOBAL SUSTAINABLE DEVELOPMENT INDEXES



By results of 2019, Kyrgyzstan is listed in the list of countries with middle level of human development taking the 120th position in the rating of the Human Development Index.



In the Global SDG Index, the Kyrgyz Republic took the 52nd place in 2020.



In the Global Environmental Performance Index (EPI), Kyrgyzstan has reduced its rating from the 71st place in 2016, to the 105th place in 2020.

# 1. AIR POLLUTION AND OZONE LAYER DEPLETION

The pollutants are released in the ambient air as a result of natural and man-made activity as well as regional and transboundary transport of pollutants. Goal of emission assessment is a complex one because of variety and complexity of sources the pollutants released in the air from, and physical and chemical processes taking place in the air.

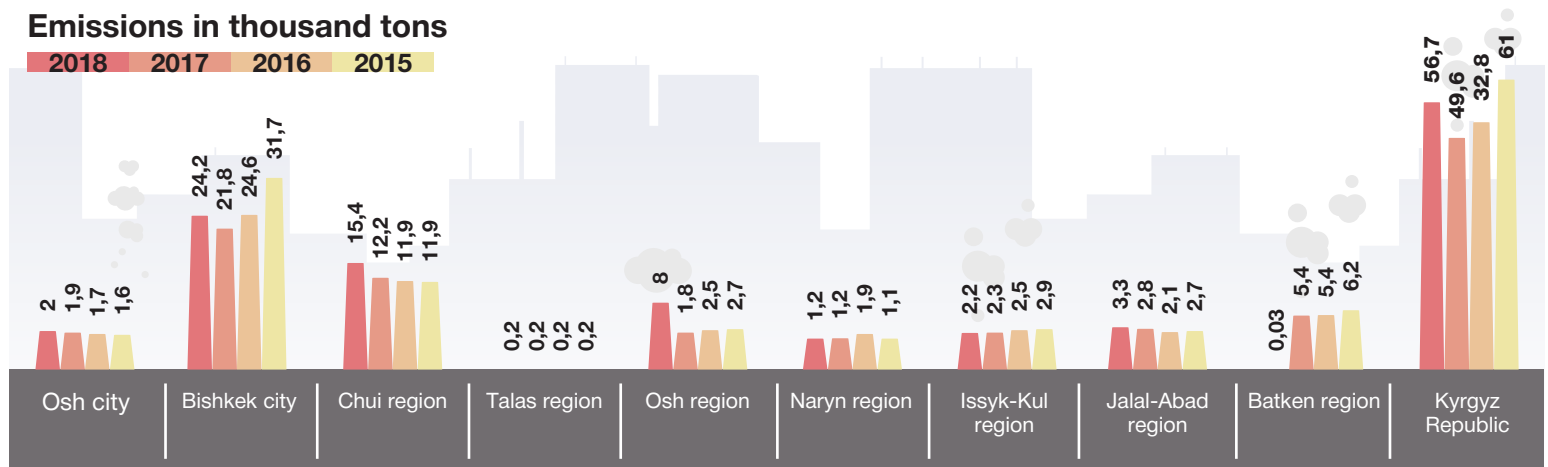
Tendency of changing in amount of pollutant emissions from the stationary sources indicates a deterioration of the situation in general, and increasing of hazardous substance emissions in air by 42,8% in a period from 2008 to 2018, with partial reduction in 2019.

## Emissions from the controlled stationary sources

In 2019, in the Kyrgyz Republic, total volume of emissions from CSSs was 50 277,7 tons, decreasing by 6 420,8 tons compared to 2018. In general, a tendency of change of pollutant emission volume from CSSs does not have stable positive or negative direction, and it depends on structure and number of the reported entities. So, during reporting period, a maximum level of emissions was observed in 2015 (61,0 thousand tons); a maximum number of the enterprises – 191 – reported also the same year. Also, in 2017, 175 enterprises reported on 49,6 tons of pollution emissions. However, analysis of the statistical series for 10 years shows an increase in emissions of harmful pollutants from CSSs by 42,8% in the air.

Major volume of emissions from the controlled stationary sources is concentrated at the enterprises and entities located within the cities and towns of Kyrgyzstan. As to administrative-regional context, a maximum volume of emissions from the controlled stationary sources is observed in Bishkek, which reached 22,0 thousand tons in 2019, or 41,5% of all emissions over Kyrgyzstan. Considerable volumes of emissions from the stationary sources are regular recorded in the Chui, Osh and Jalal-Abad regions.

## Distribution of pollutant emissions from the controlled stationary sources on territory of the Kyrgyz Republic

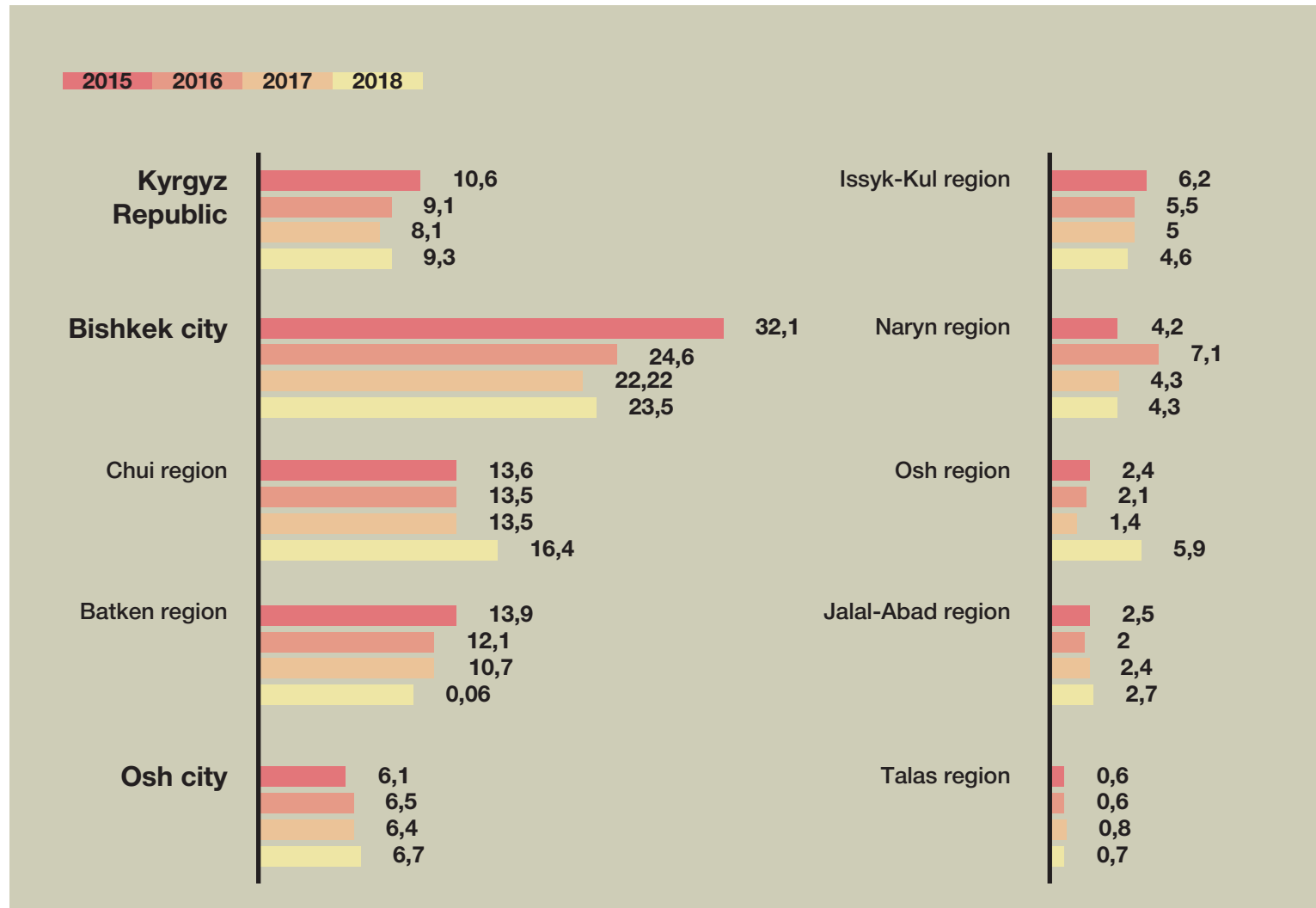


Source: NSC KR

Based on NSC KR data, about 70% of emitted particles are captured and neutralized every year from total amount of pollutants from the controlled stationary sources.

In 2018, there were 9,3 kg of the pollutants per capita in the country. It is more than in 2017. Amount of the pollutants was increased per capita in the Jalal-Abad, Osh and Chui regions, and Osh and Bishkek cities.

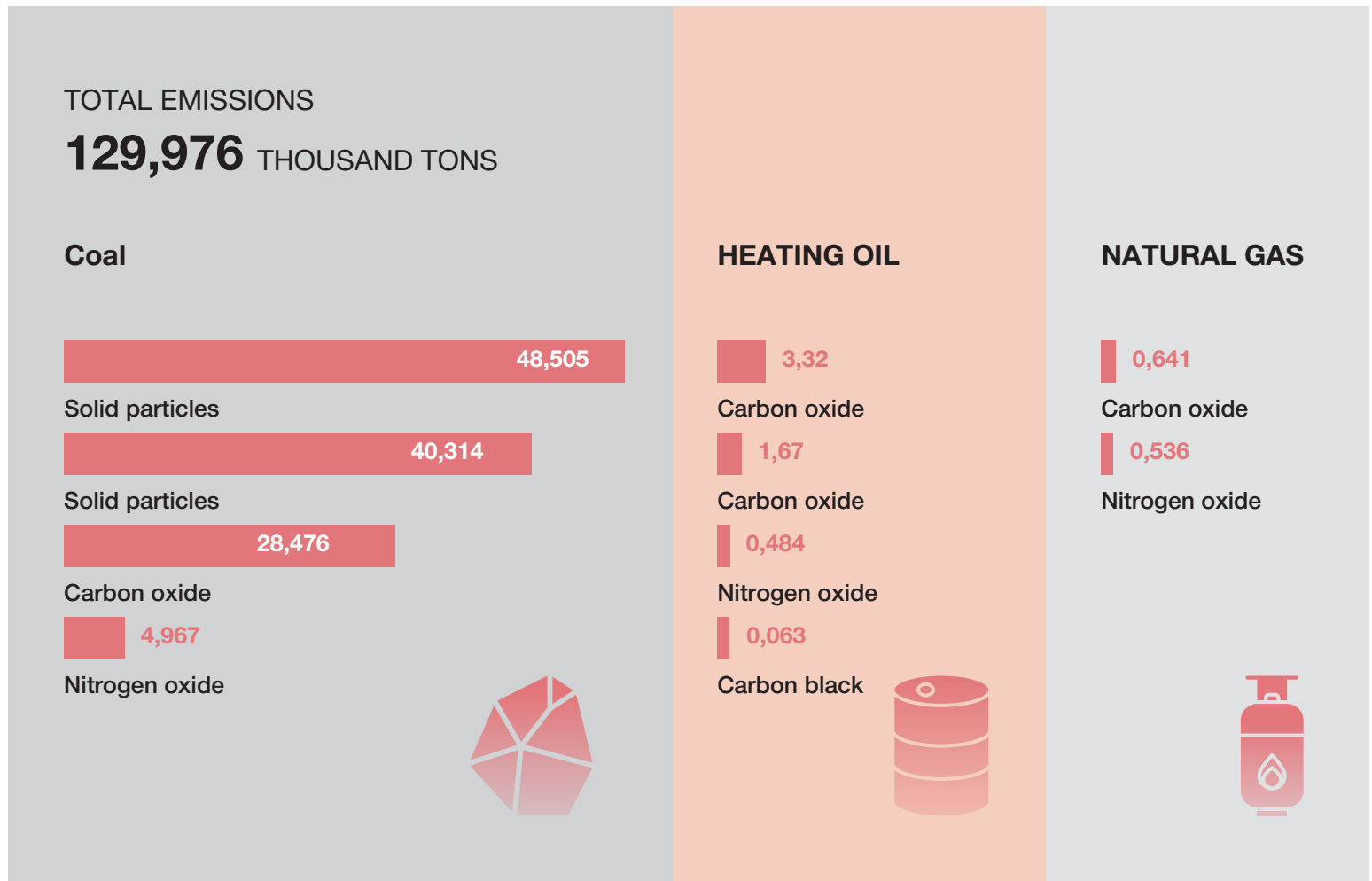
### Pollution emissions from the controlled stationary sources on the territory of Kyrgyzstan per capita, kg



In general, emissions per 1 sq. km amounted to 283,6 kg, per capita – 9,3 kg in Kyrgyzstan in 2018.

In 2019, the State Agency of Environment Protection and Forestry (SAEPF) conducted the expert estimated assessment of total air emissions for 2018 based on total consumption of three types of fuel resources (including the fuel consumed by the population) – coal, natural gas and heating oil. Calculation was made based on data of the National Statistical Committee by amount of the fuel consumed for conversion to other types of energy and directly as the fuel (including supply to the population). It is worth to say that precise data on emissions depends on combustion and cleaning technologies.

### Expert calculations of air emissions from combusted fuel at the stationary sources for 2018, thousand tons



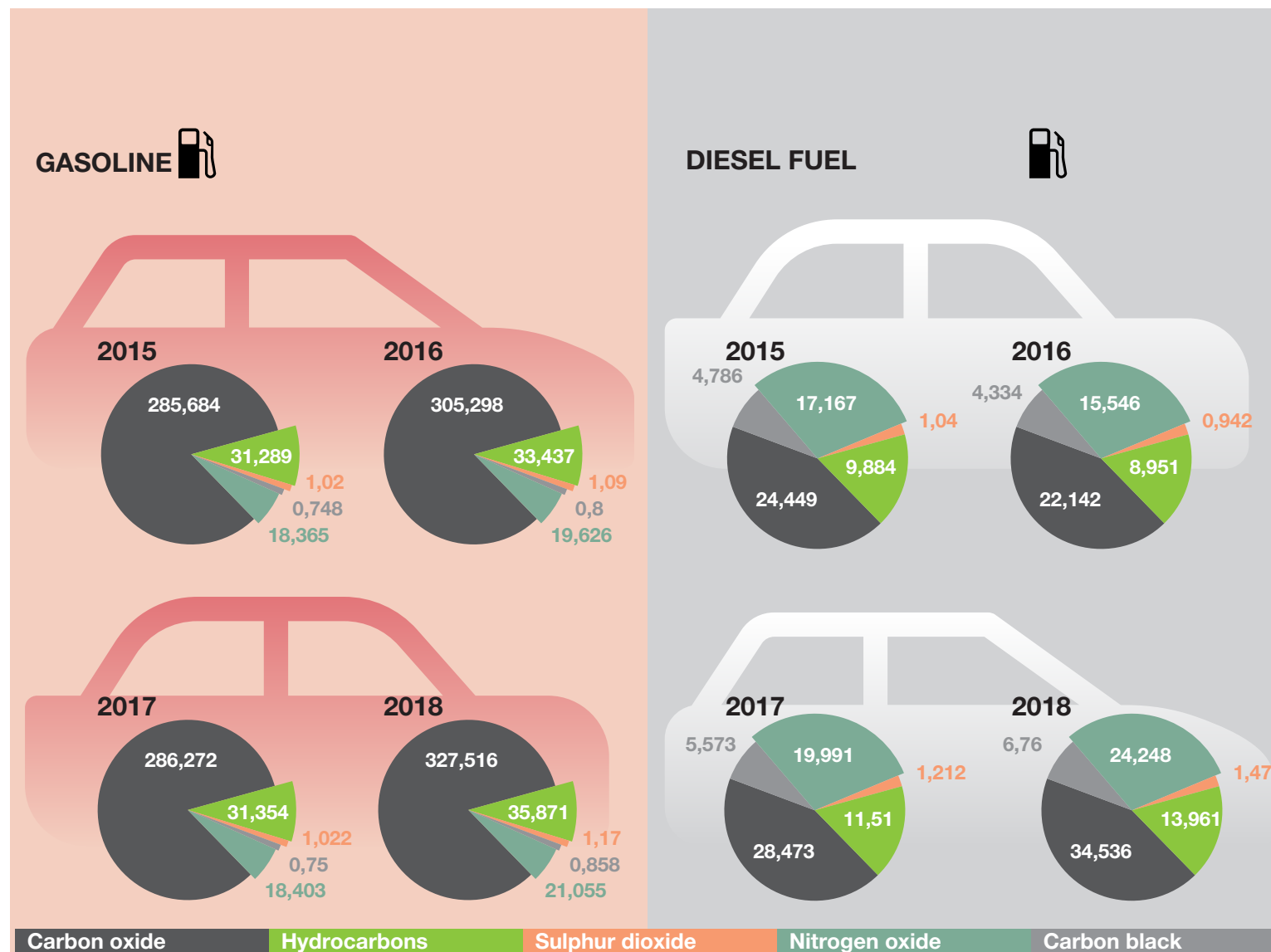
Source: SAEPP's expert calculations using data from NSC KR



## Air emissions from movable sources

Main emissions from the movable sources were calculated based on figures of the consumed fuel (automobile gasoline and diesel fuel) as the fuel for mobile sources (transport, agricultural and road construction machinery/equipment) in Kyrgyzstan according to official data of the NSC KR presented in the Fuel-Energy Balance of the Kyrgyz Republic for corresponding periods.

### Air emissions from the fuel consumed by the movable sources, thousand tons



Source: SAEPF's expert calculations using data from NSC KR

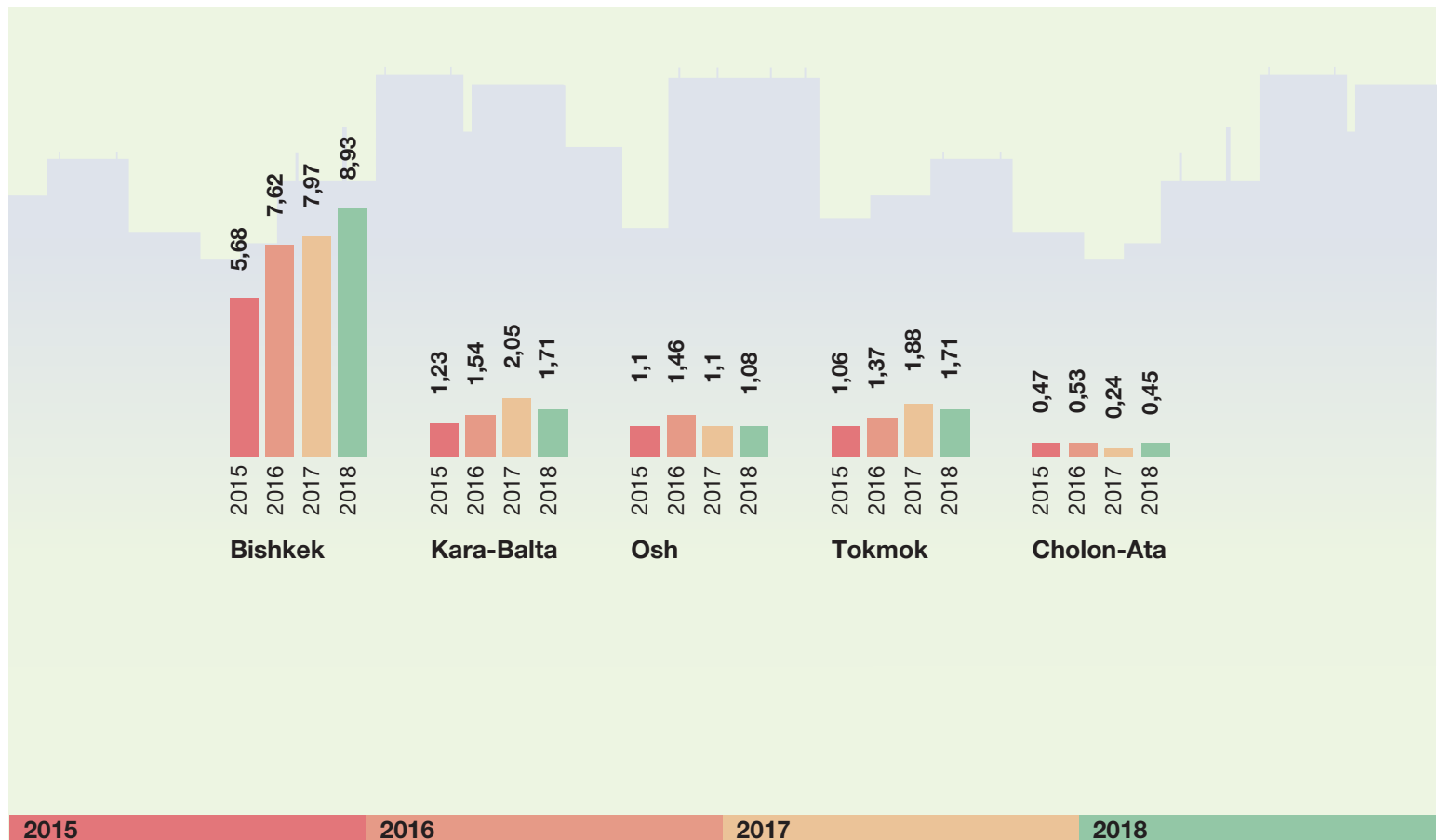
## Air quality in urban area

Consideration of air quality factors gives an opportunity to assess both the state of environment and negative impact of exceeded pollutant concentrations in the surface air layer on human health and environment.

Based on all meteorological factors and their quantitative ratio, the Chui valley, Bishkek and Osh cities are characterized by high climatic potential for air pollution (PAP=3,4-3,6) and its low self-cleaning ability. In this regard, even insignificant emissions of hazardous substances can create high level of air pollution, especially in winter

In Bishkek, air pollution is the highest in the Kyrgyz Republic for many years. In 2018, IAPI was 8,93. During 2015-2018, index growth was 57,2%. It is explained by air pollution increase in the city with nitrogen dioxide, nitrogen oxide, dust of fine fractions and formaldehyde.

## Complex index of air pollution by the cities of the Kyrgyz Republic for 2015-2018

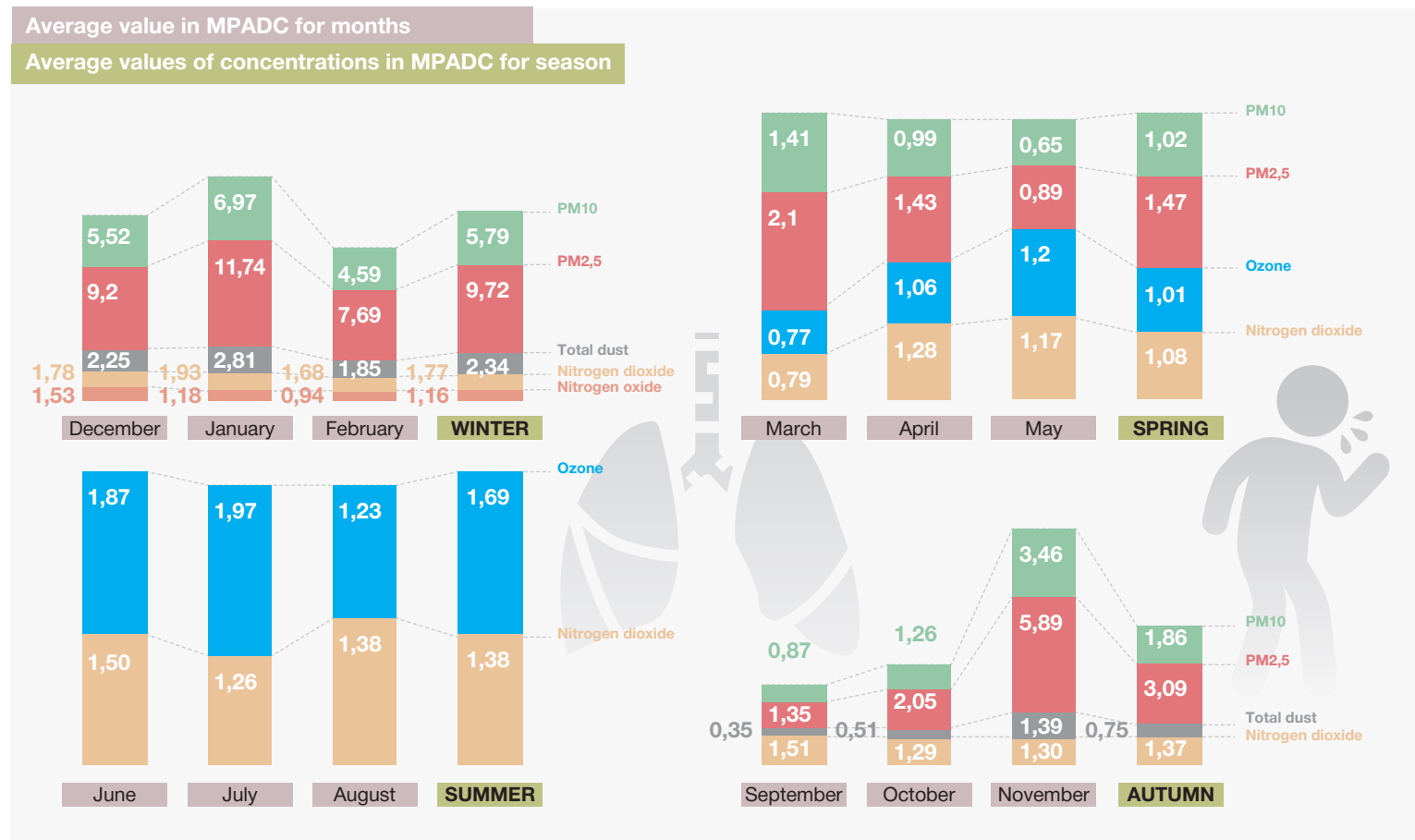


In 2018, there were 286 days with exceeding of MPCs in the air in Bishkek, at least one of the pollutants, what creates a potential threat for human health. Bishkek is the most polluted city, where an average annual concentrations of classic and specific pollutants steadily exceed the sanitary and hygienic standard in one and more times except sulphur dioxide and ammonium. In 2018, index of pollution in Bishkek reached 8,93 – it is the highest rate in the last decade.

### Independent expert assessment of air pollution status in Bishkek during 2018 and 2019

Average values of pollutant concentrations in air in Bishkek are shown (shares of MPADC) by the months and seasons from December 2017 to December 2019 inclusively. Of all substances, only those substances were included which concentrations have exceeded 1 MPADC at least in one the months of the season.

### Average values of air pollutant concentrations in Bishkek by the months and seasons from December 2017 to December 2019



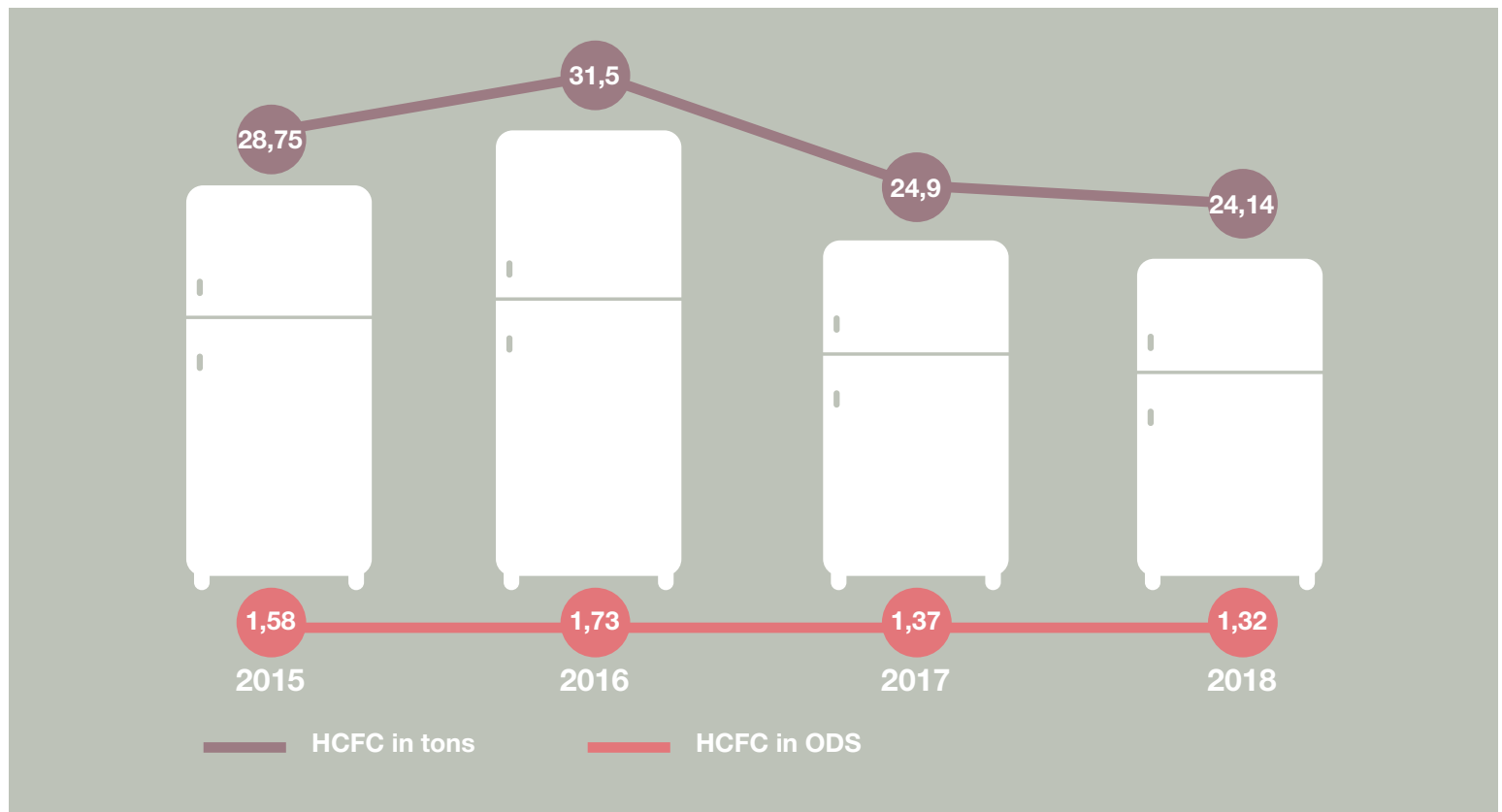
Source: Chair “Meteorology, Ecology and Environment Protection”, Natural-technical Faculty of the Kyrgyz-Russian Slavic University

In winter 2018-2019, five pollutants had average values of exceeding MPADC concentrations: both nitrogen oxides, total dust and its fine fractions – PM2,5 and PM10. Dust PM2,5 (7,7-11,4 MPADC), PM10 (4,6-7 MPADC) and total dust (1,9-2,8 MPADC) are main air pollutants in winter. In two years, an absolute “record” belongs to PM2,5 – on January 7, 2018 its concentration reached 20,8 MPADC. Concentration of nitrogen oxides NO and NO2 had average values in few times less rather fine dust fractions: NO2 (1,7-1,9 MPADC) and NO (0,9-1,5 MPADC). By intensity and continuation of air pollution in Bishkek in winter time, the dust does not have any competitors among other pollutants, and by degree of danger to human health it is in the first place.

### Ozone depleting substances consumption

Since 2000, there has been a significant decrease in consumption of ozone-depleting substances. While 597,9 tons of ODS were consumed in 2000, the volume of consumed ODS was decreased in 87,8 times in 2018. In 2018, the volume of ozone depleting substances consumed in the republic amounted to 1,32 tons of ODC (Figure 1.12).

### Ozone depleting substances consumption in the Kyrgyz Republic during 2015-2018



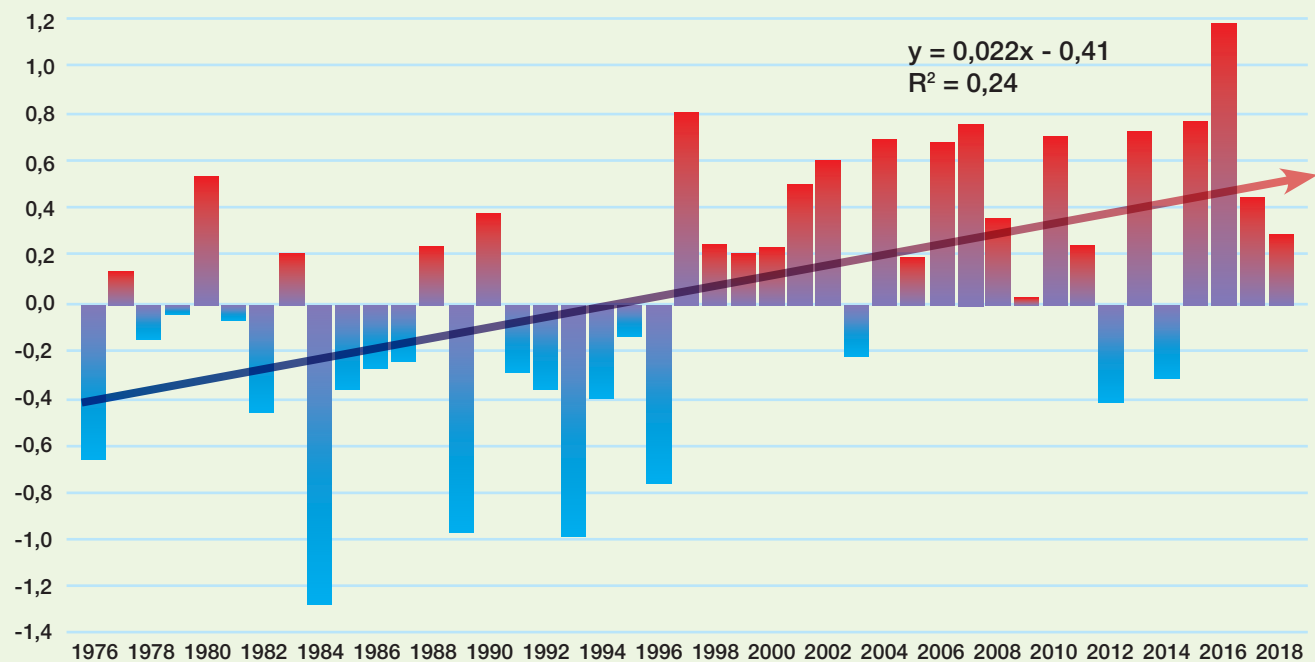
Source: Ozone Center

## 2. CLIMATE CHANGE

### Change in air temperature

Changes of anomalies (deviation from a standard during 1981-2010) of an average annual air temperature for 32 meteorological stations of Kyrgyzstan from 1976 to 2018.

**Time series of anomalies of the annual and seasonal air temperatures (°C) averaged over the territory of Kyrgyzstan for the period of 1976-2018. Anomalies were calculated relatively to 1981 - 2010. Black line is linear trend.**

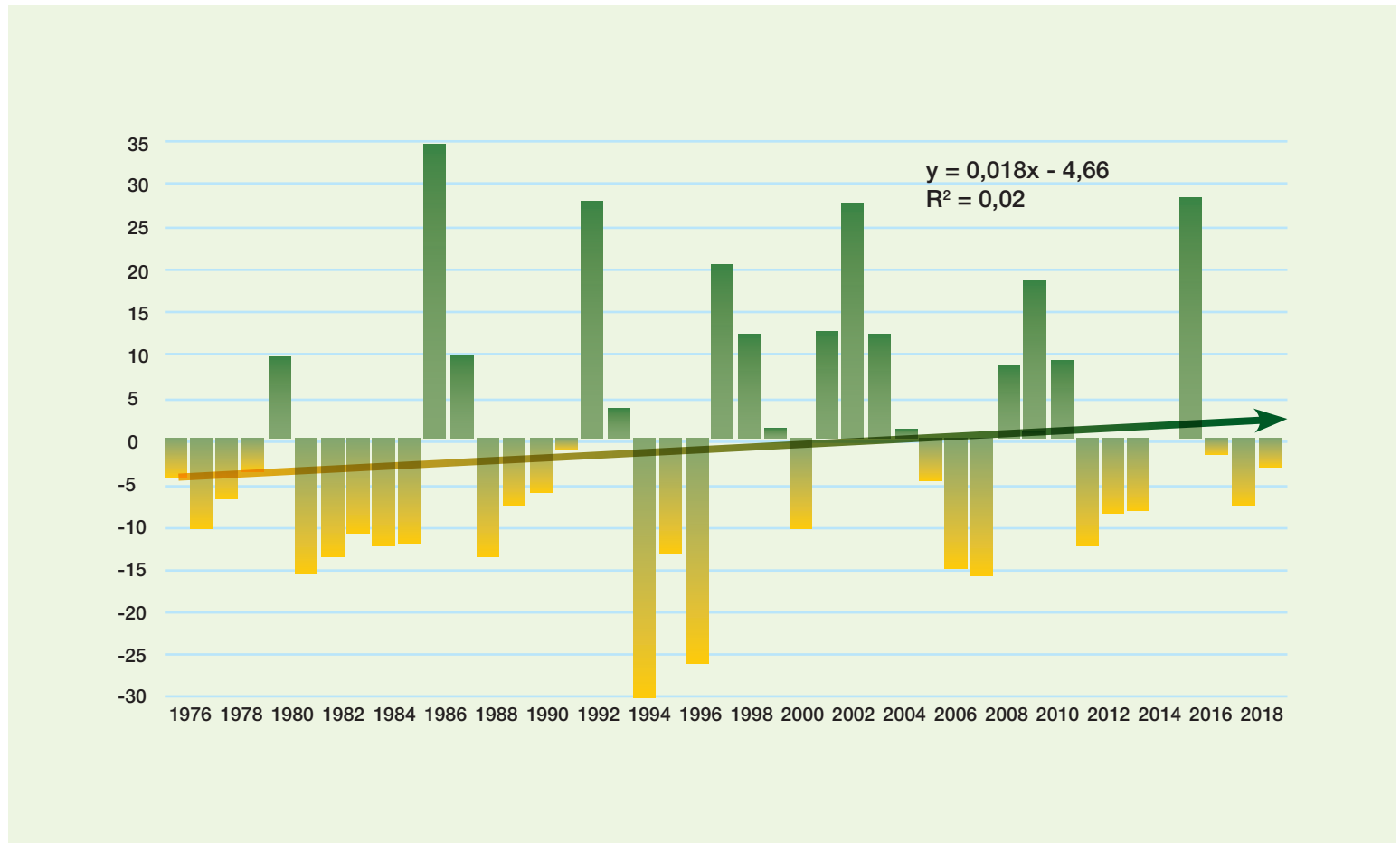


Source: expert calculations based on data from the Kyrgyzhydromet

Over past 43 years, widespread increase in an average annual surface air temperature has being observed in Kyrgyzstan – in average by 0,22°C for every 10 years (linear trend assessment). This increase is consistent with increase in global air temperature over the same period by 0,17°C for every 10 years.

### Change in precipitation

**Time series of anomalies of annual precipitation amounts (in %) for 1976-2018, spatially averaged across the territory of the Kyrgyz Republic. Anomalies were calculated relatively to the baseline period 1981-2010. Linear trend for the period is highlighted in black color.**



Source: expert calculations based on data of the Kyrgyzhydromet

In average, in Kyrgyzstan for 1976-2018, a weak trend of an increase in the annual amount of precipitation by 1,8% every 10 years has being observed.

### 3. WATER RESOURCES

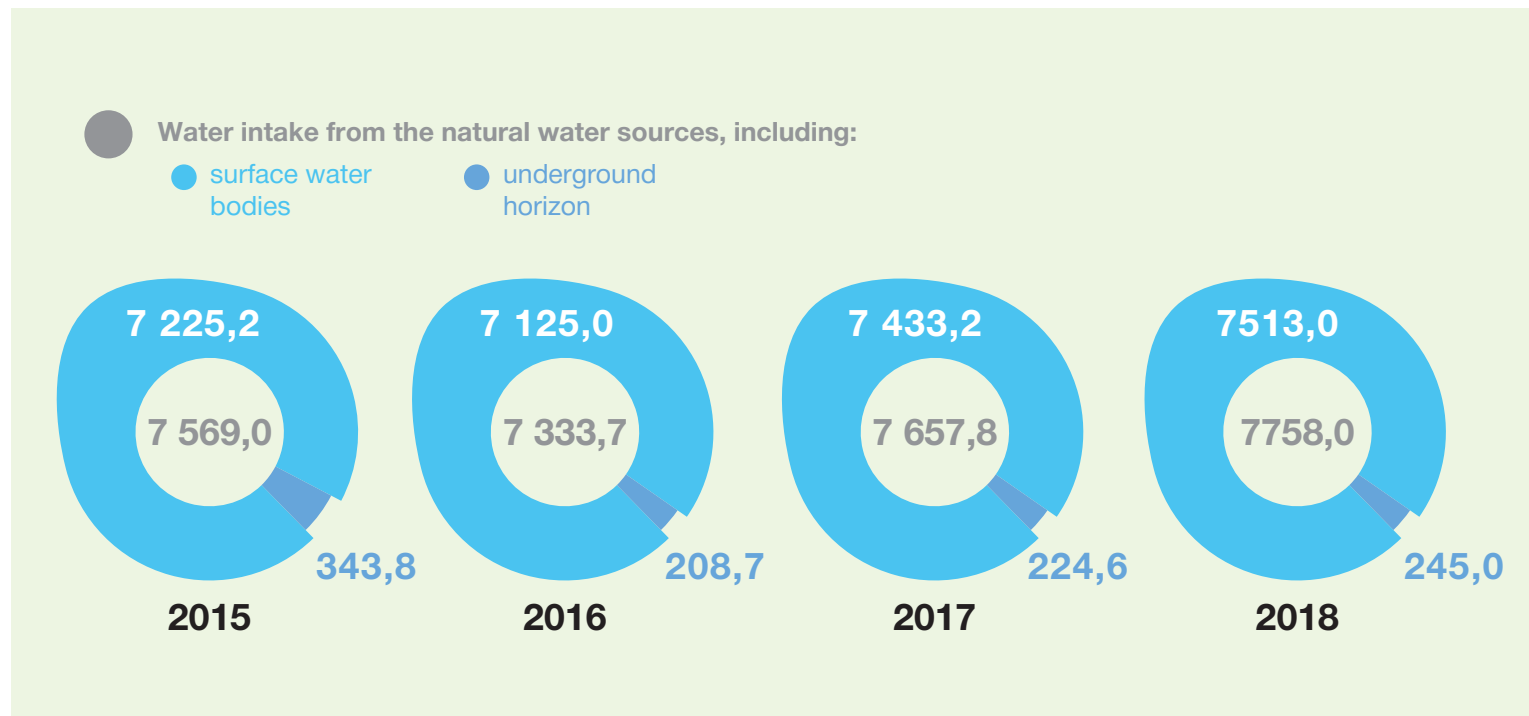
Water resources are the most important and at the same time the most vulnerable components of the environment, which are very quickly changed under impact of economic activity. Well-being of the population and sustainable development of the economy of the republic depend on rational use of these resources, maintenance of their proper quality.

The Kyrgyz Republic has abundant reserves of water resources. The total volume of available water reserves in Kyrgyzstan is estimated as 2,458 cubic km, including 650 cubic km of water (26,4%) stored in glaciers, 1,745 cubic km in lakes (71%), as well as 13 cubic km of potential groundwater reserves (0,5%) and 44,5 to 51,9 cubic km of the average annual river flow (2%). The total annual volume of renewable water resources is estimated as 46,5 cubic km.

#### Fresh water intake

The total intake of fresh water in 2018 was slightly increased by 1,03% and amounted to 7758 thousand cubic meters compared to 2015. It is related to an increase in water intake from surface water sources by 1,04%. Water intake from the underground horizon was decreased by 29% compared to 2015 and amounted to 245,0 thousand cubic meters.

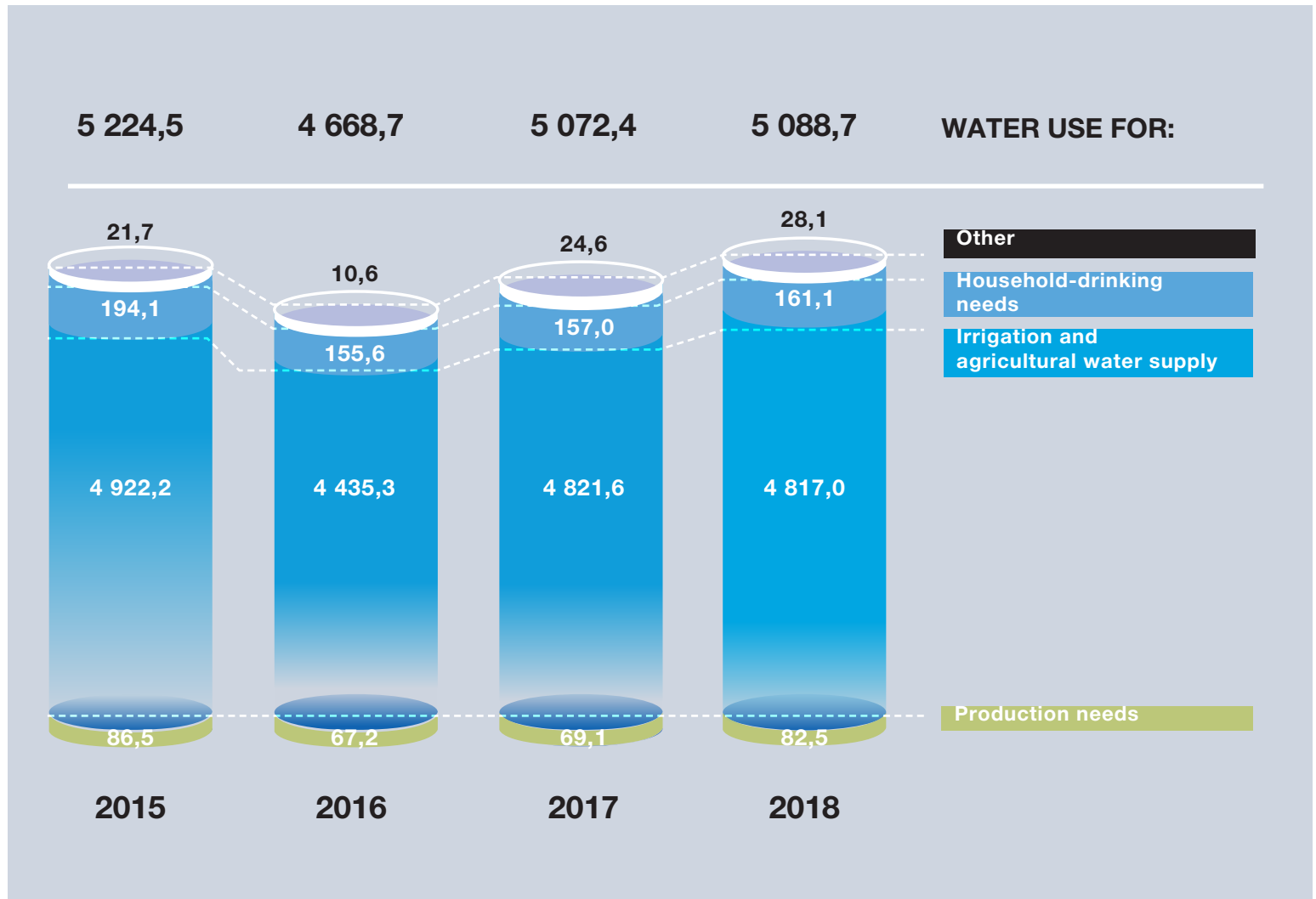
#### Total volume of fresh water intake, mln m<sup>3</sup>



## Water use

Agriculture is the main sector of water use in the republic – use of water for irrigation and agricultural water supply. The use of water for industrial purposes has significantly decreased over the past 30 years. Of the total amount of water taken, 95% is used by agriculture, 1,5% by the industry, and 3,5% by other consumers, including drinking water supply to the population. Overall water use was decreased by 2,6% in 2018 compared to 2015.

### Use of fresh water for various needs, mln m<sup>3</sup>











































Source: NSC KR



## Household water consumption per capita

Household water use per capita was decreased from 32,2m<sup>3</sup> in 2015 to 26,5m<sup>3</sup> in 2018

### Household water consumption per capita, cubic meters









































	2015	2016	2017	2018
Kyrgyz Republic	 32,2	 25,3	 25,6	 26,5
Batken region	 6,9	 6,8	 0,4	 0,4
Jalal-Abad region	 10,9	 14,0	 12,2	 12,2
Issyk-Kul region	 23,2	 33,3	 41,5	 43,5
Naryn region	 9,4	 9,6	 8,4	 11,7
Osh region	 27,6	 26,8	 26,1	 27,3
Talas region	 11,1	 14,9	 14,4	 13,8
Chui region	 <b>77,3</b>	 23,2	 23,2	 23,4
Bishkek city	 <b>53,2</b>	 <b>51,4</b>	 <b>55,7</b>	 <b>54,8</b>
Osh city	 32,2	 25,3	 25,6	 26,5

Source: NSC KR

### Access of the population of safe drinking water

The level of sustainable access of the population to safe drinking water and safe sources of drinking water in the republic as a whole was 91,8% in 2018. Access to safe drinking water sources was increased in rural areas of the Osh region from 72,4% in 2015 to 81,8% in 2018, and the Batken region from 63,7% in 2015 to 78,5% in 2018. However, it was decreased in rural areas of the Issyk-Kul and Jalal-Abad regions. In the Chui region and Bishkek, almost 100% of the population has access to safe drinking water sources.

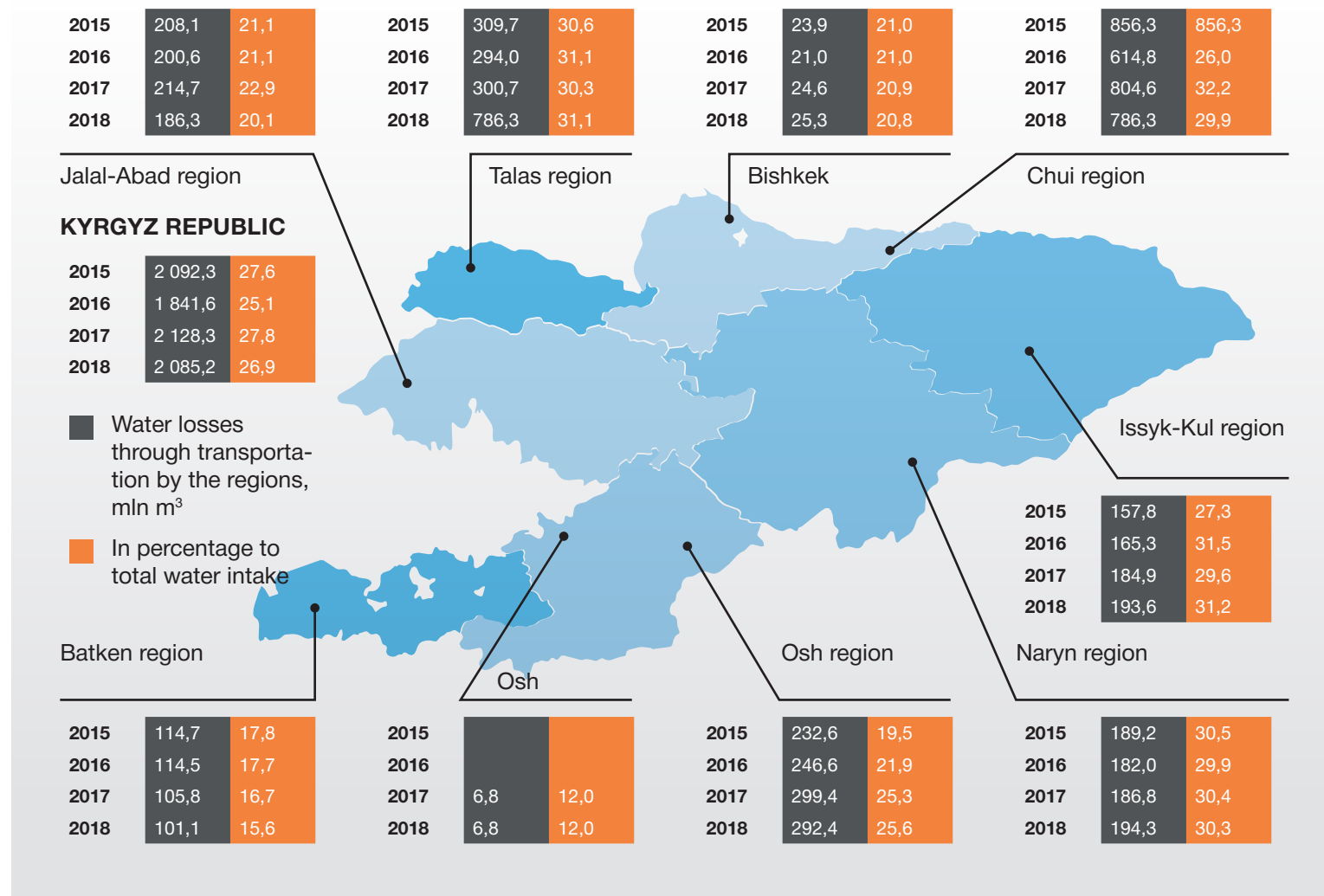
**Proportion of the population having access to safe drinking water sources by the regions, in percentage to total number of the population**

	2015 г.	2016 г.	2017 г.	2018 г.
<b>THE KYRGYZ REPUBLIC</b>	 <b>89,1</b>	 <b>89,9</b>	 <b>91,1</b>	 <b>91,8</b>
Urban settlements	99,1	99,3	99,3	99,3
Rural area	83,7	84,9	86,7	87,8
<b>BATKEN REGION</b>	 <b>73,3</b>	 <b>74,1</b>	 <b>79,0</b>	 <b>83,6</b>
Urban settlements	95,7	97,0	98,2	96,0
Rural area	63,7	64,8	71,0	78,5
<b>JALAL-ABAD REGION</b>	 <b>87,7</b>	 <b>87,3</b>	 <b>91,2</b>	 <b>86,4</b>
Urban settlements	98,9	99,8	100,0	100,0
Rural area	84,0	83,2	88,3	81,9
<b>ISSYK-KUL REGION</b>	 <b>96,4</b>	 <b>97,3</b>	 <b>97,0</b>	 <b>96,0</b>
Urban settlements	99,7	99,7	99,7	100,0
Rural area	95,1	96,4	95,9	94,4
<b>NARYN REGION</b>	 <b>90,3</b>	 <b>95,9</b>	 <b>95,8</b>	 <b>96,3</b>
Urban settlements	99,9	100,0	100,0	100,0
Rural area	88,7	95,2	95,1	95,7
<b>OSH REGION</b>	 <b>74,5</b>	 <b>76,4</b>	 <b>77,3</b>	 <b>83,2</b>
Urban settlements	100,0	100,0	100,0	100,0
Rural area	72,4	74,5	75,4	81,8
<b>TALAS REGION</b>	 <b>99,2</b>	 <b>100,0</b>	 <b>99,4</b>	 <b>99,4</b>
Urban settlements	100,0	100,0	100,0	100,0
Rural area	99,1	100,0	99,3	99,2
<b>CHUI REGION</b>	 <b>100,0</b>	 <b>100,0</b>	 <b>100,0</b>	 <b>100,0</b>
Urban settlements	100,0	100,0	100,0	100,0
Rural area	100,0	100,0	100,0	100,0
<b>BISHKEK</b>	 <b>100,0</b>	 <b>100,0</b>	 <b>100,0</b>	 <b>100,0</b>
<b>OSH</b>	 <b>96,7</b>	 <b>96,6</b>	 <b>95,7</b>	 <b>96,5</b>

## Water losses

During 2015-2018, water losses through transportation were changed slightly, either decreasing or increasing. The main losses are related to infiltration in the irrigation network, the on-farm network of which is mainly represented by canals in ground channel and accounts for more than 27% across the republic. In the Chui, Naryn, Talas and Issyk-Kul regions, the amount of losses from water intake is about 30%. In other regions, losses vary within 20-30% of water intake volume.

### Water losses through transportation by the regions, mln m<sup>3</sup>

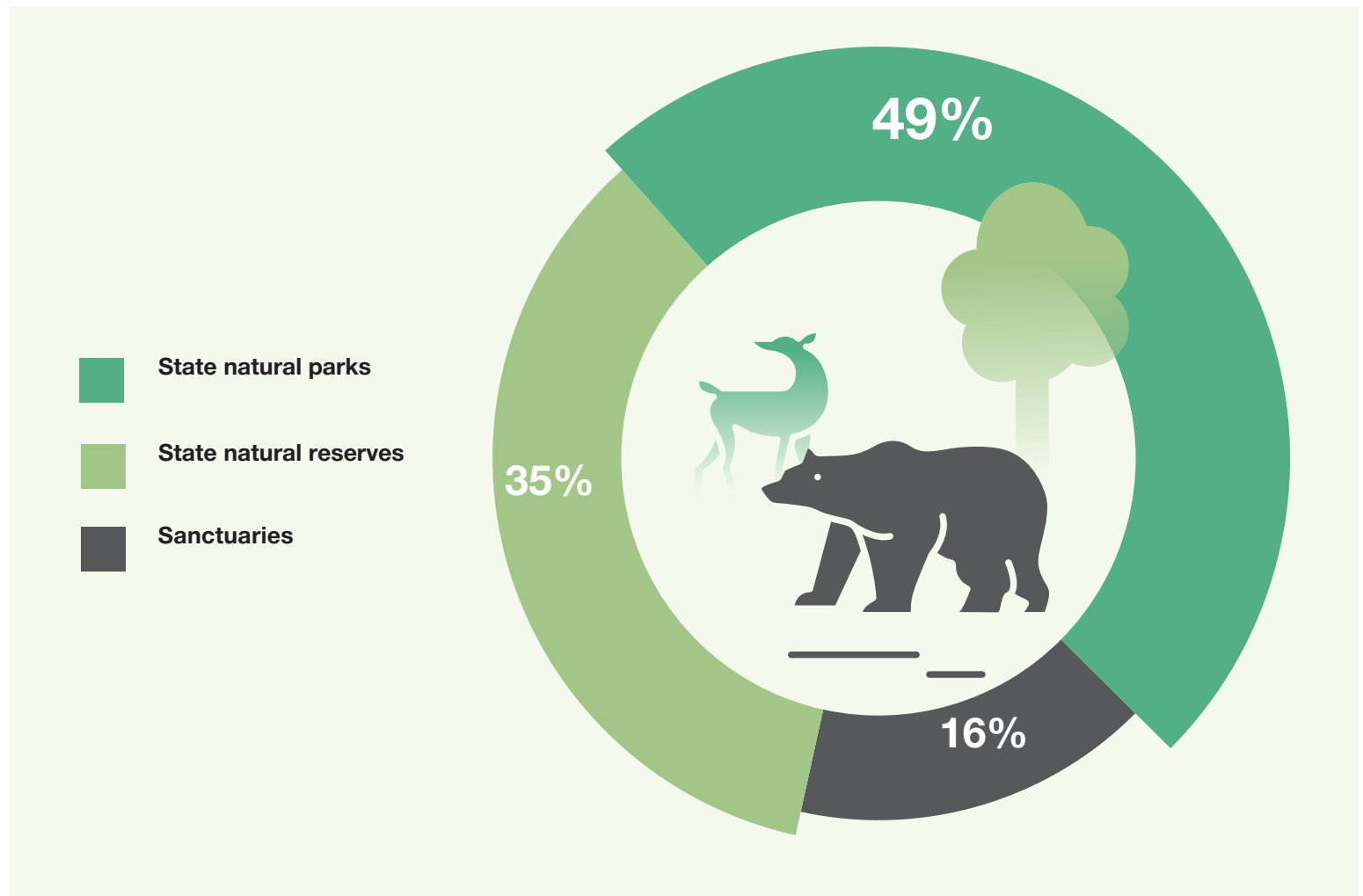


## 4. BIODIVERSITY

### Protected areas

In the Kyrgyz Republic, the PAs network covers 7,38% of land of the country and includes 10 state natural reserves (509,9 thousand hectares), 13 state natural parks (724,9 thousand hectares), 64 sanctuaries (complex, botanical, zoological, forestry, total area is 241,5 thousand hectares), and the botanical garden named after E.Gareev in Bishkek and zoological park in Karakol.

### Distribution of PAs area and sites, in percent.

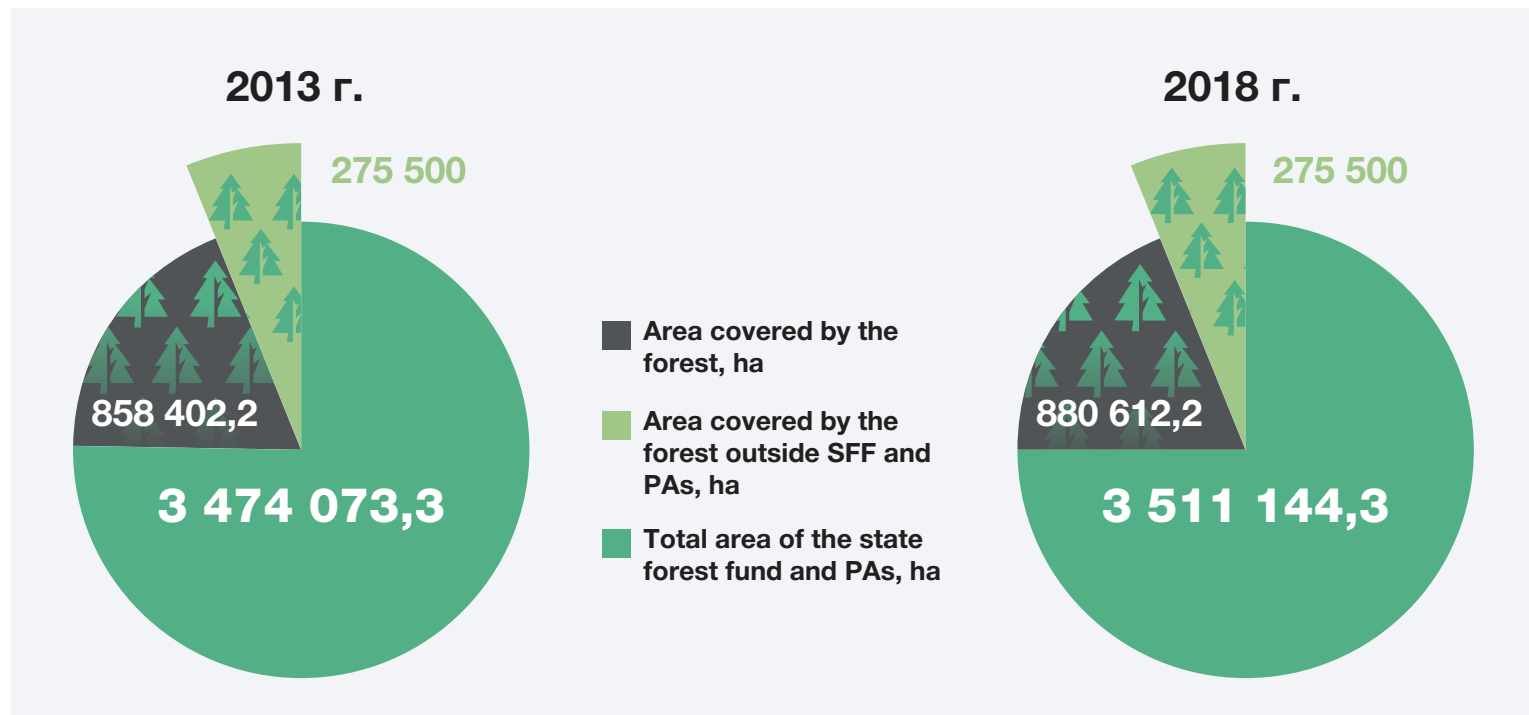


Source: SAEPP

## Forest resources

Area covered by the forests in Kyrgyzstan is 1 156,1 thousand ha or 5,79% of total area of the country (by preliminary accounted data of 2019).

### Analysis of change of the forest covered area from 2013 to 2018



Source: SD "KLOU" SAEPP

## Endangered species and protected species

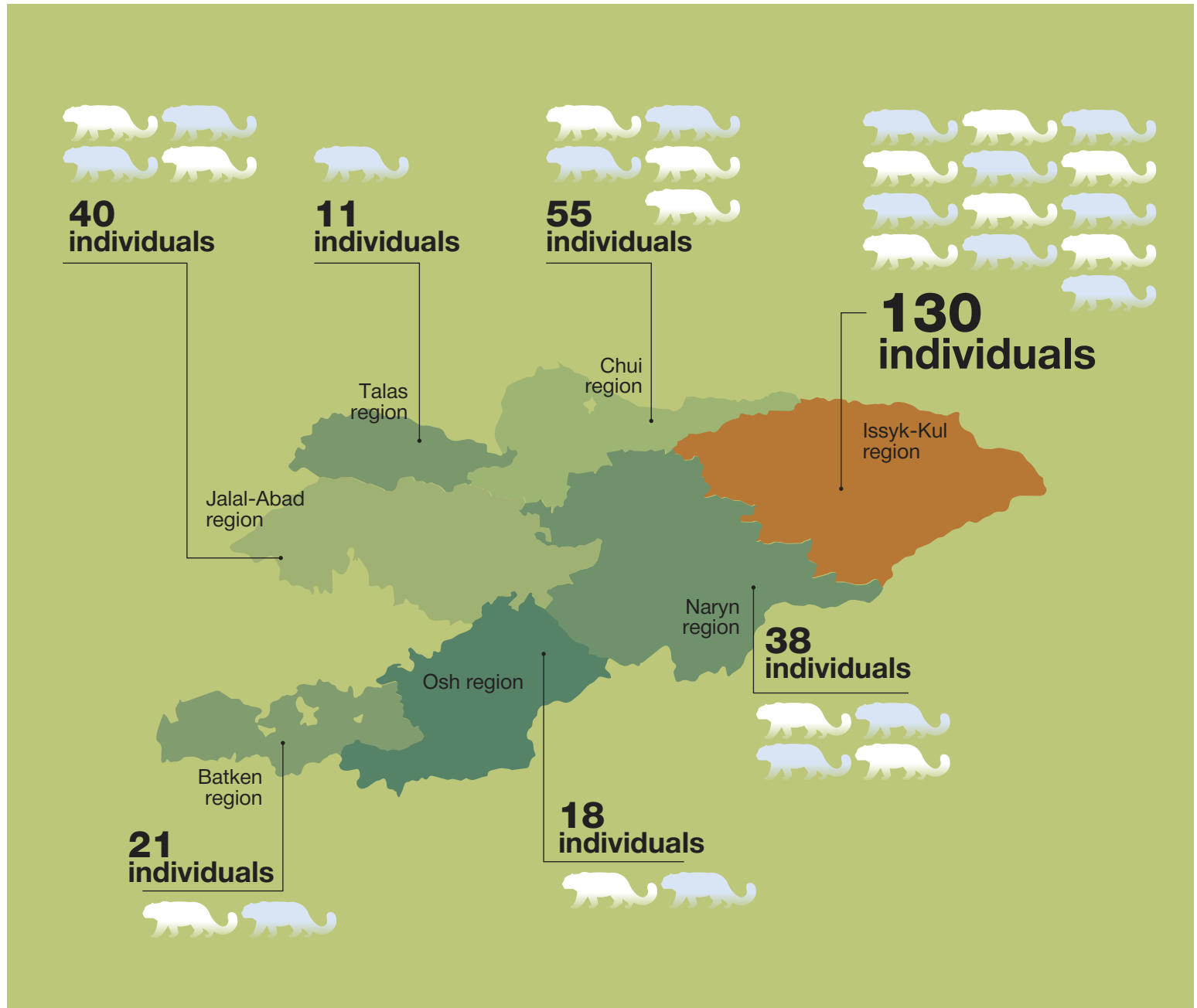
The list of endangered and threatened with extinction species to be included in the Red Book of the Kyrgyz Republic<sup>1</sup> includes 57 species of birds, 23 species of mammals, 2 species of amphibians, 8 species of reptiles, 7 species of fish, 18 species of arthropods, as well as 87 species of higher plants and fungus being under threat of extinction.

In the second edition of the Red Book of the Kyrgyz Republic (2007), the list of plants and fungi, which are subject to protection, was increased by 22 species (in relation to the first edition). The number of protected species of flowering plants was increased to 83 (before 71), and 4 species of fungus were added (previously, representatives of this group were not included in the lists of endangered species).

Currently, according to preliminary estimates, the number of the snow leopards is 313 individuals in the republic.

<sup>1</sup> The Resolution of the Government of the Kyrgyz Republic as of 28 of April 2005, №170

## Distribution of the snow leopards by the regions, individuals














Source: SAEPP

## Trends towards changing of the number of some species

In the Kyrgyz Republic, monitoring is conducted only for certain species of the birds and animals. Accounting is carried out for the rare and endangered animal species listed in the Red Book of the Kyrgyz Republic (Table 4.8), as well as for the main gaming species of the wild animals (Table 4.9), on the territories of hunting/gaming grounds and protected areas twice a year.

### Data on number of some mammals and birds listed in the Red Book of the Kyrgyz Republic, inhabiting in game/hunting grounds and PAs (heads)

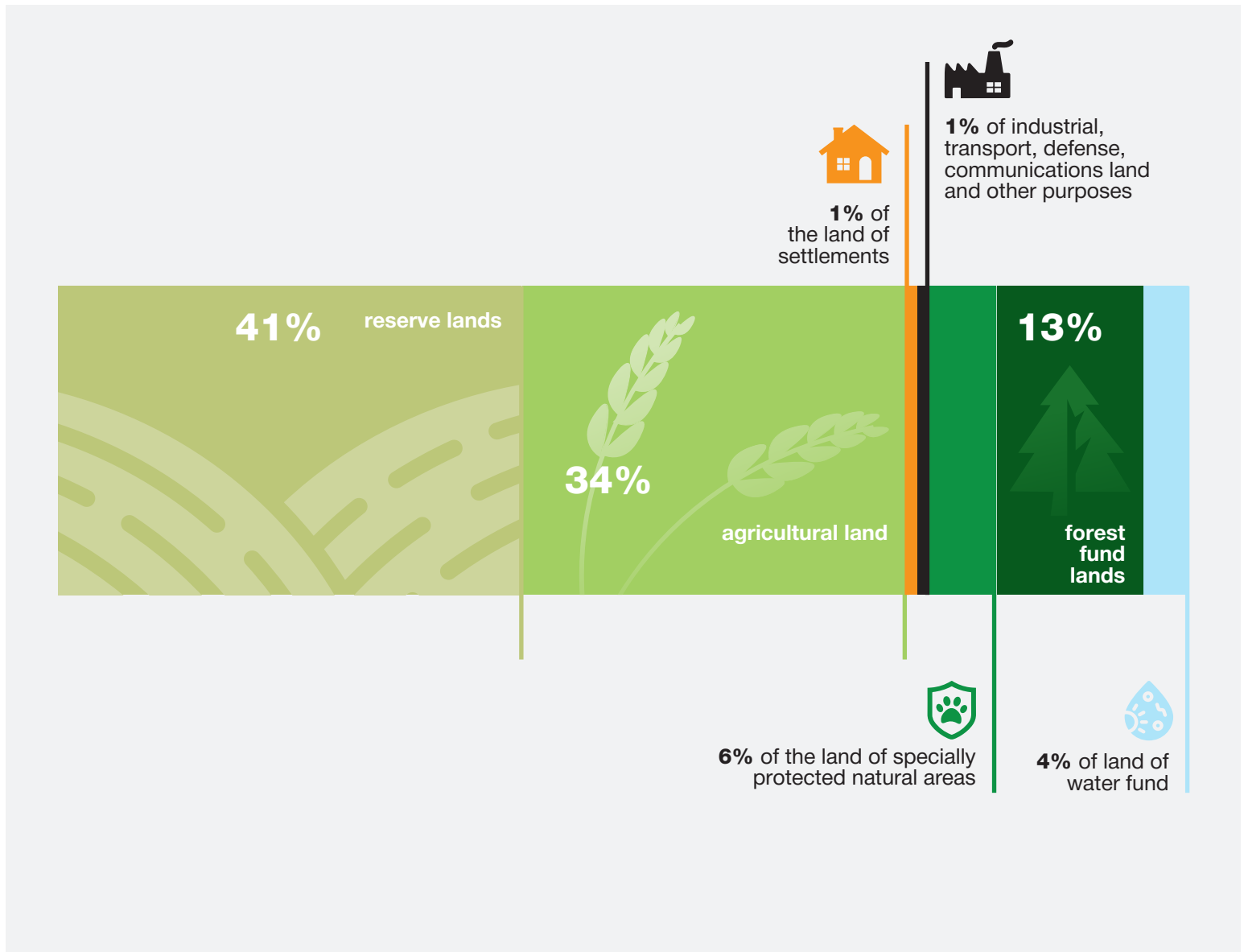
	WILD SHEEP (total), including:	By subspecies of the wild sheep			RED DEAR	SNOW LEOPARD	LYNX	BEAR	PALLAS'S CAT	OTTER	GOLDEN EAGLE	PORCUPINE	STONE-MARTEN	BLACKCOCK
		Wild sheep, Pamir (Marco Polo)	Wild sheep, Tien Shan	Wild sheep, Severtsev										
														
2015	18346	13823	4505	18	472	311	1074	342	86	20	155	229	3839	188
2016	17813	13639	4174	-	458	310	1154	326	78	20	171	244	3907	190
2017	16669	12628	4013	28	313	254	1034	199	20	20	436	195	2454	299
2018	18224	13857	4334	33	403	313	1264	307	69	20	347	196	3702	318

Source: SAEPP

## 5. LAND RESOURCES

On January 1, 2018, the Kyrgyz Republic has the territory of 19994,9 thousand hectares.

### Land distribution by categories in the Kyrgyz Republic at the beginning of 2018, in percentage



Source: NSC



## Crop land exposed to degradation

Quality characteristics of the agricultural land by degradation features (beginning of the years), hectares

Types of degradation	2016	2017	2018		
			total	arable land	Pastures and hey-fields
Salinized	1190,8	1190,8	1190,8	163,8	1027
Alkalinized	480,2	480,2	480,2	99,3	380,9
Waterlogged	138,6	138,6	138,6	14,6	124
Stony	4021,2	4021,2	4021,2	346,7	3674,5
Deflation-threatened (wind erosion)	5689,8	5689,8	4912,2	651,1	4261,1
Exposed to water erosion	5626,8	5626,8	5626,8	714,6	4912,2

## Load of pastures



### Pressure of the livestock on the pastures, in % of permitted load

	From April 15 to July 15	From July 16 to October 15
<b>Kyrgyz Republic</b>	<b>56,5</b>	<b>123,2</b>
Batken region	76,8	167,5
Jalal-Abad region	63,4	138,4
Issyk-Kul region	58,8	128,3
Naryn region	29,6	64,6
Osh region	76,6	167,2
Talas region	42,4	92,6
Chui region	90,0	196,4

Source: Expert calculations based on NSC data

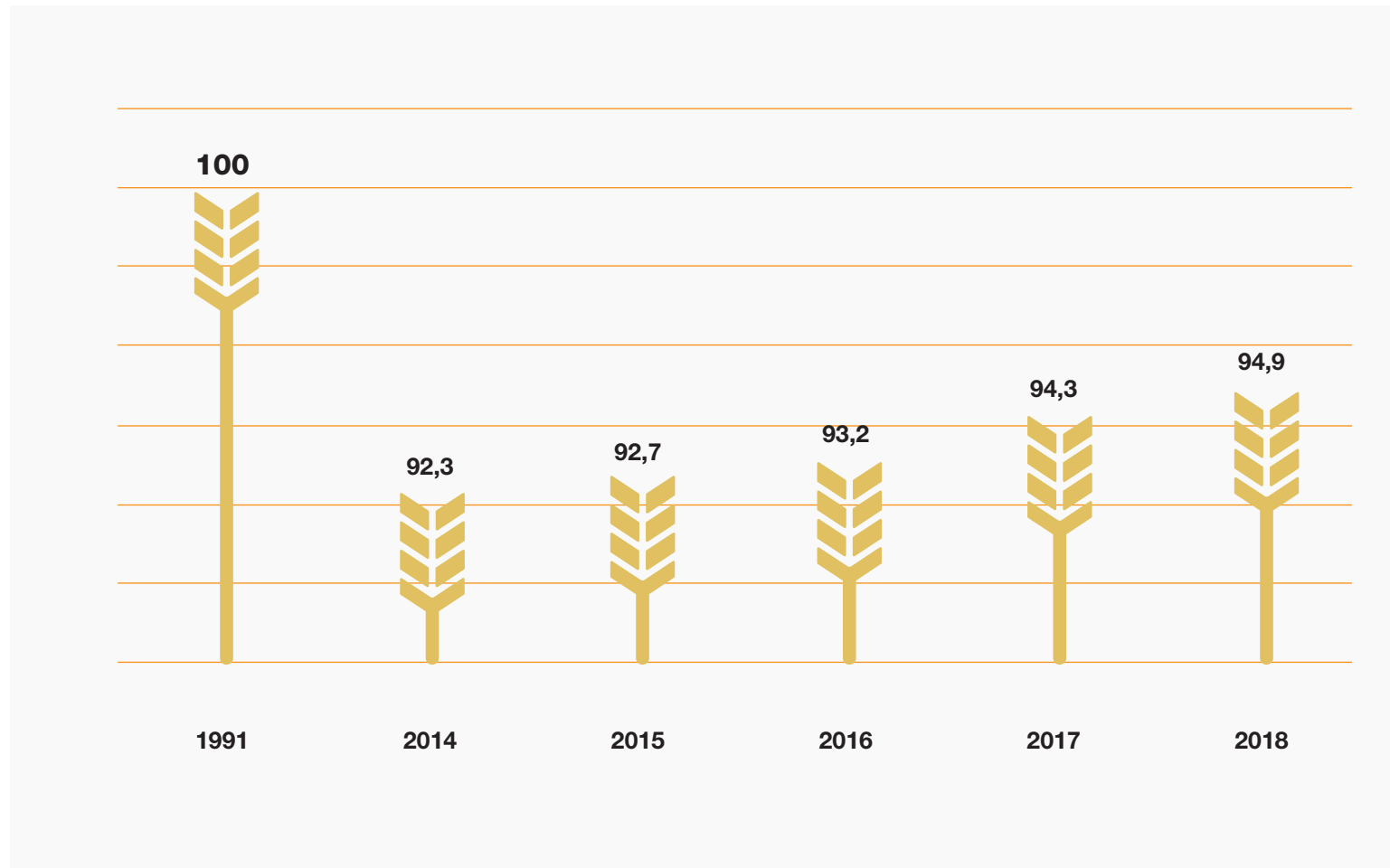
Calculations on the load of the livestock on pastures show that the territory of pasture lands of the Chui, Batken, Osh, and Jalal-Abad regions has exhausted the potential for livestock growth.

## 6. AGRICULTURE

The Kyrgyz Republic is an agricultural country where more than 60% of the population lives in rural areas, where the poverty level is higher than in urban areas and depends on agricultural products. Agriculture provides the population not only with food for consumption, but also provides employment opportunities in agriculture and processing industry.

In 2018, the total sown area of agricultural crops in the republic as a whole amounted to 1214,9 thousand hectares and compared to 2014 (1181,1 thousand hectares) was increased by 33,7 thousand hectares, or 2,9%, but compared to 1991 (1279,6 thousand hectares) was decreased by 64,7 thousand hectares, or 5,1%.

### Sown areas for agricultural crops 2014-2018 to level of 1991, in percents



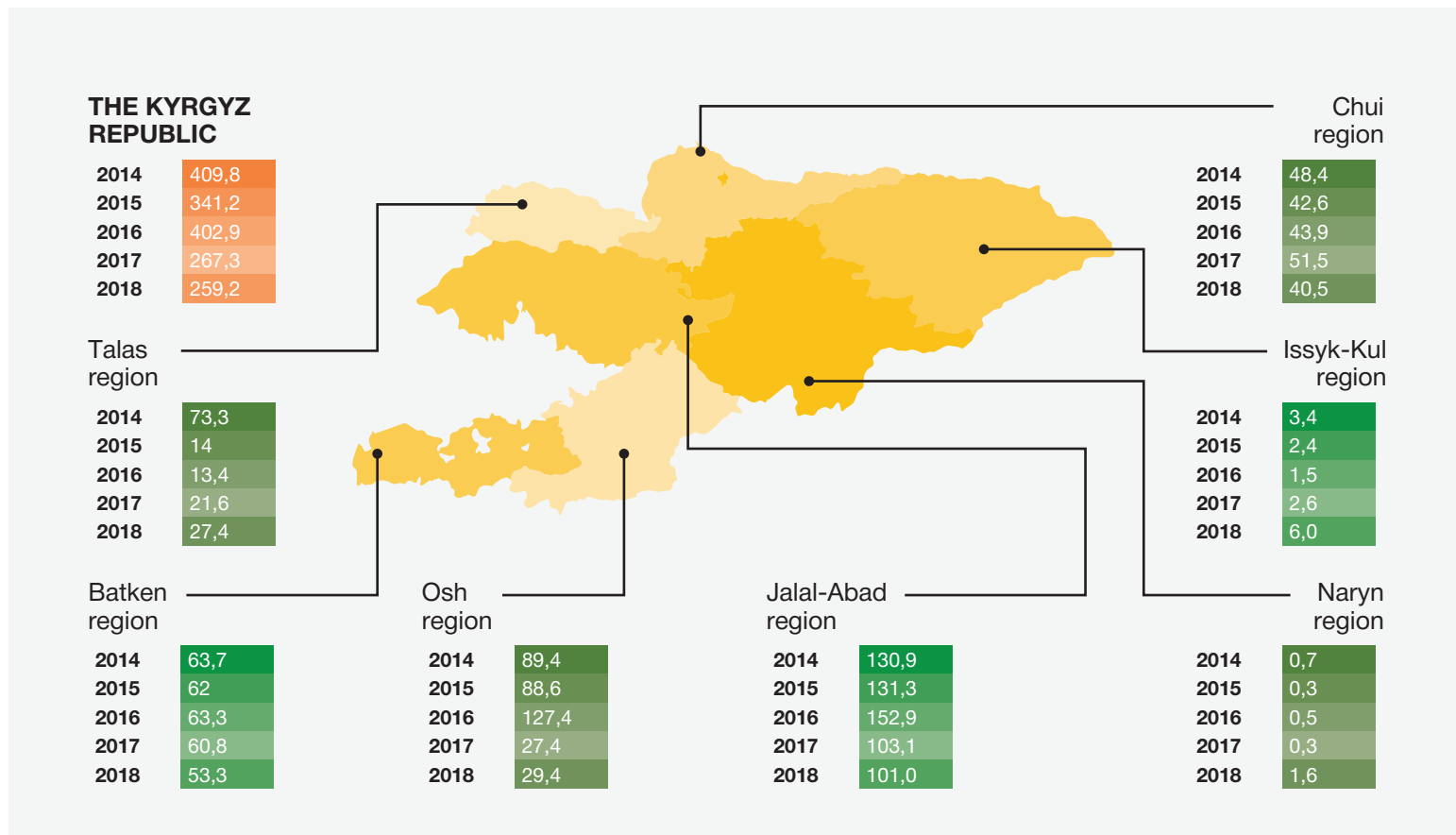
## Land irrigation

At the beginning of 2018, total area of the irrigated arable land was 866,6 thousand hectares, of which 842,8 thousand hectares or 97,6% were used for the sown fields during vegetation season, and the area of unused arable land was about 24 thousand hectares or 2,7%. In Kyrgyzstan, the area of unused arable land is accounted annually. The largest share of unused irrigated arable land is in the farms of the Naryn (7,4%), Batken (5,0%) and Issyk-Kul (2,7%) regions.

## Use of mineral and organic fertilizers

259,2 thousand centners of mineral fertilizers were used for the harvest of 2018, in terms of active substance, compared to the level of 2014, it was decreased by 150,6 thousand centners or by 36,8%.

## Use mineral fertilizers (in terms of active substance) by the regions of the Kyrgyz Republic, thousand centners



Source: Department of chemicalization and plant protection, MAFPM

For the 2018 harvest, 301,5 thousand tons of organic fertilizers were applied, and compared to the level of 2014, it was decreased by 88 thousand tons, or 22,7%. During the period under review, from 2014 to 2018, the amount of organic fertilizers applied to agricultural crops is decreased almost across Kyrgyzstan (except the Naryn region). In the Jalal-Abad region, compared to 2014, there is a significant decrease in the application of organic fertilizers by 54%, Issyk-Kul farms – by 26,9%, Osh farms – 16,5%, and Chui region farms did not apply organic fertilizers for the 2018 harvest.

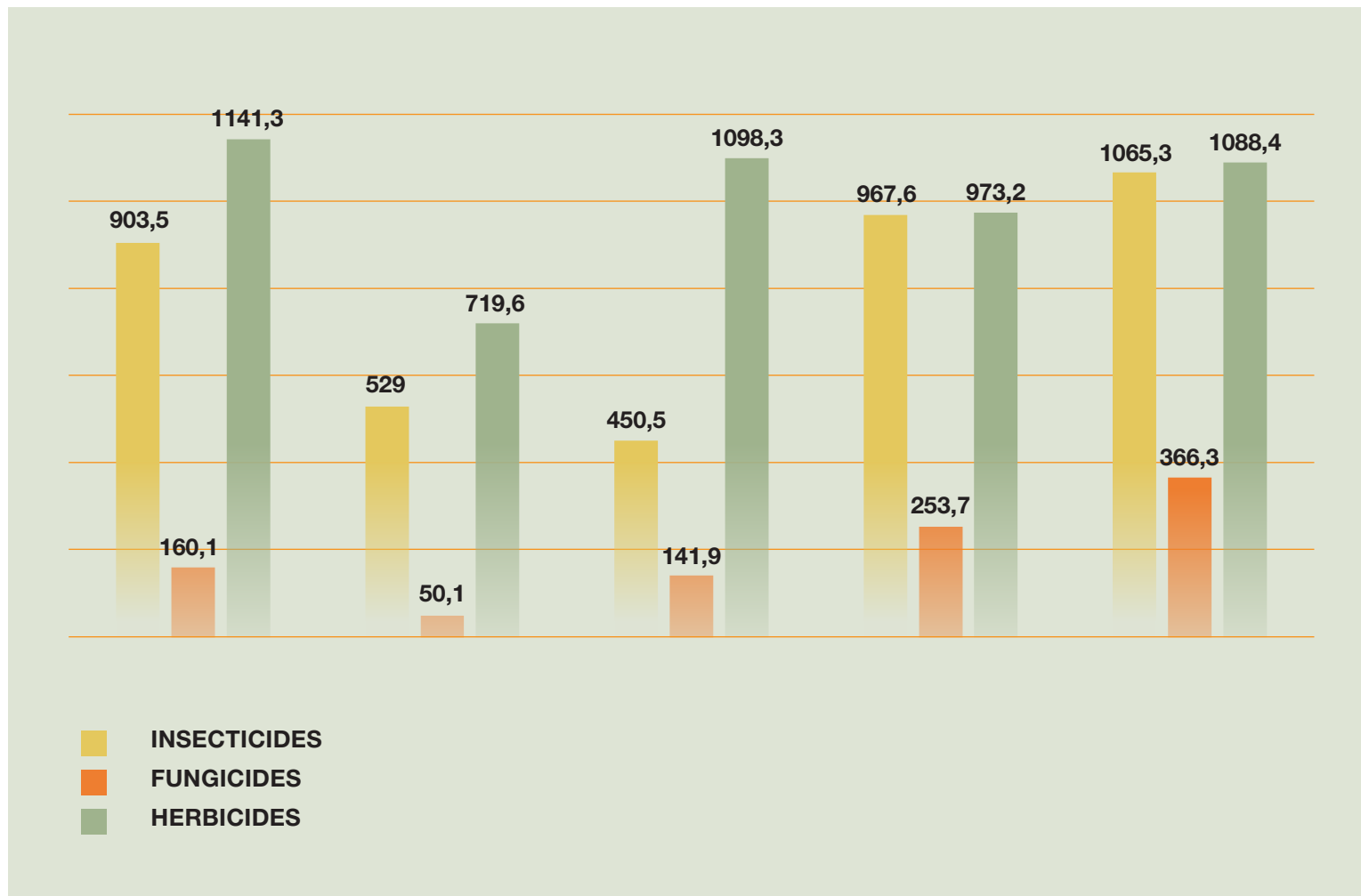
### Organic fertilizers used by the regions of the Kyrgyz Republic, thousand tons

	2014	2015	2016	2017	2018.	2018 to 2014, %
The Kyrgyz Republic	389,8	415,6	470,8	314,2	301,5	77,3
Batken region	9	6,9	7,3	10,1	8,4	93,4
Jalal-Abad region	66,7	59,4	48,9	28,5	30,1	45,2
Issyk-Kul region	104,0	106	104,0	87,0	76,0	73,1
Naryn region	123,1	119,5	100,8	115,9	124,8	101,4
Osh region	32,3	32,8	34,3	29,9	27,0	83,5
Talas region	35,4	36,5	36,1	36,4	35,2	99,3
Chui region	19,3	54,5	139,4	6,5	0,0	0,0

## Import and use of pesticides

Pesticides are not produced in the Kyrgyz Republic. For the needs of agriculture, commercial entities import pesticides permitted to be used. The list does not include items related to POPs.

### Import of pesticides in the Kyrgyz Republic in 2014-2018, tons



Source: Expert calculations based on NSC KR data

In 2018, compared to 2014, total volume of imported pesticides was increased by 14%, including volume of fungicides – by 2 times, insecticides – by 17%, herbicides were decreased by 5%.

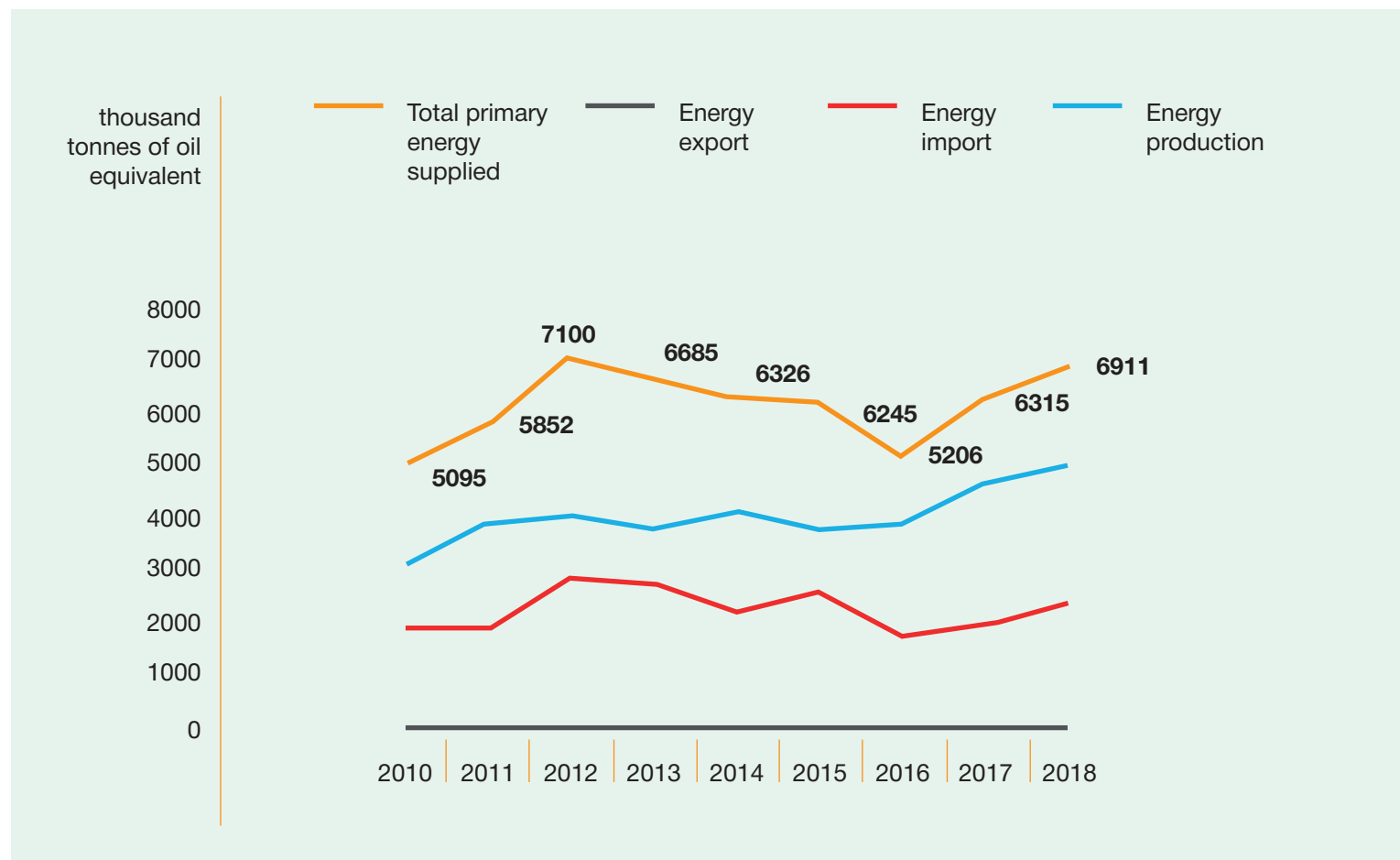
## 7. ENERGY

The energy sector plays fundamental role in economic development of the Kyrgyz Republic, and level of energy resource consumption determines a degree of the energy impact on environment. Due to continued growth of the population, economic development, energy consumption is also increased all the time including electric power consumption.

### Total amount of the supplied primary energy

This indicator reflects quantity of energy resources, annually supplied in the country in general and particularly by types of fuel and energy.

### Dynamics of sources providing energy resources in the Kyrgyz Republic, 2010-2018

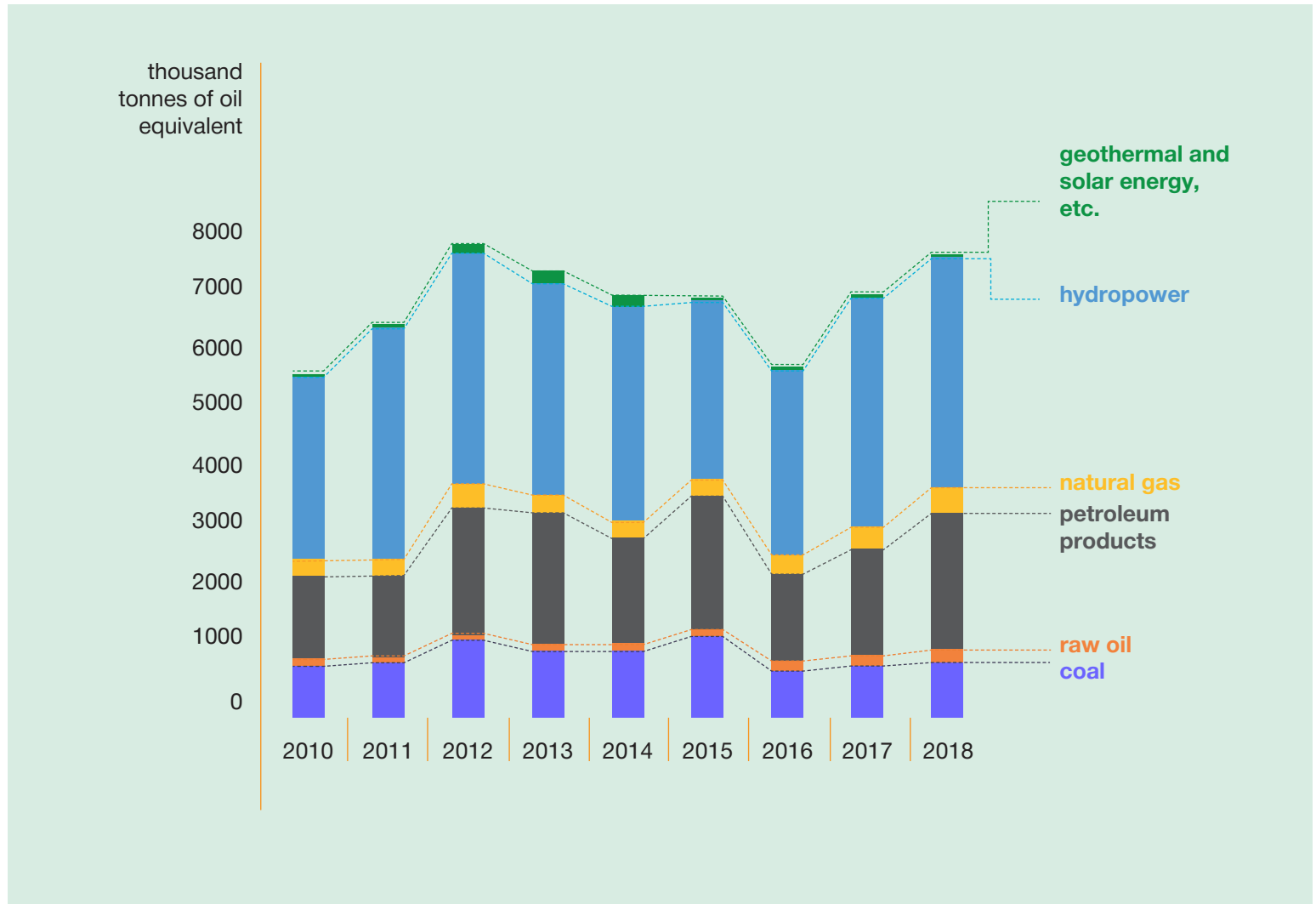


Source: Expert calculations based of NSC data

As a percentage, dynamics of the country supply with the fuel and energy resources from its own generation and production ranges from 62% to 76,5% of total amount of fuel and energy resources.

The total amount of supplied primary energy has increased by 35,6% since 2010 and was equal to 6,9 million tons of oil equivalent in 2018. Major share of increase was due to primary energy produced in the country, which has been increased by 60,8% since 2010, and accounted for 73,5% of total amount of primary energy supplied in 2017.

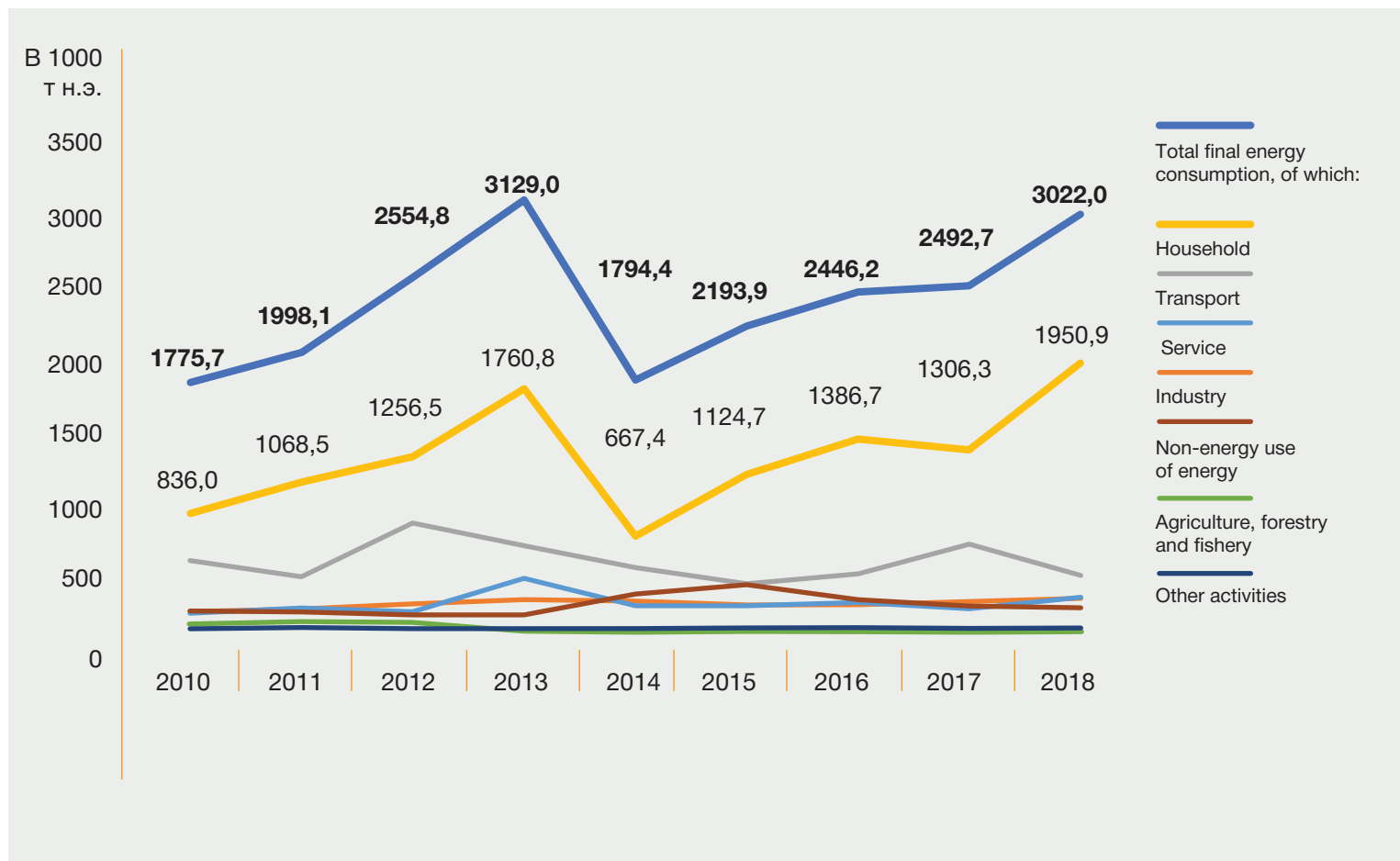
### Dynamics of power distribution by types of primary energy in the Kyrgyz Republic, 2010 - 2018,



Source: Expert calculations based on NSC KR data



## Final energy consumption



Source: Expert calculations based on NSC KR data

The structure of energy resources distribution for the period from 2010 to 2018 shows a significant increase in total energy consumption from 1,7 thousand tons of o.e. in 2010 to 3 thousand tons of o.e. in 2018, or by 70%. The increase in final consumption was mainly due to an increase in household consumption – from 47,1% to 64,6%, or by 1114,9 thousand tons of oil equivalent.

The share of coal use for municipal, cultural, household and other needs, including supply to the population (from 761,5 to 1459 thousand tons) and for industrial activities (from 52 to 385,9 thousand tons) has been significantly increased. It is worth to say that significant increase was observed in electricity consumption (by 83%, from 40% to 57% of the total distributed electricity) and heat (by 27%, from 68% to 85% of the total distributed heat) for cultural and household needs, including delivery to the population.

Significantly increased consumption of gasoline – by 182,8% to 792 thousand tons in 2018, and diesel fuel – by 236,8% to 750 thousand tons in 2018, almost completely used for transport (including delivery to the population).

## Energy intensity

According to calculations, the energy intensity of GDP by final energy consumption for the period 2010-2018 was not change, and the energy intensity by the total amount of primary energy supplied was decreased by 17,5%.

## Energy intensity

	Unit	2010	2011	2012	2013	2014	2015	2016	2017	2018
<b>GDP in ППС in constant prices of 2011</b>	Mln international dollars	14890	16106	16382	18486	19590	20571	21691	23142	24492
<b>FINAL ENERGY CONSUMPTION (FEC)</b>										
<b>FEC</b>	1000 t o.e.	1776	1998	2555	3129	1794	2194	2446	2493	3022
<b>Energy intensity (FEC)</b>	thousand t o.e. / mln. International dollars	0,12	0,12	0,16	0,17	0,09	0,11	0,11	0,11	0,12
<b>TOTAL AMOUNT OF SUPPLIED PRIMARY ENERGY (SPE)</b>										
<b>SPE</b>	1000 t o.e.	5095	5852	7100	6685	6326	6245	5206	6315	6911
<b>Energy intensity (SPE)</b>	t o.e. / mln. International dollars	0,34	0,36	0,43	0,36	0,32	0,30	0,24	0,27	0,28

Source: Expert calculations based on NSC data.

## Energy consumption per capita

	Unit	2011	2012	2013	2014	2015	2016	2017	2018
<b>Energy consumption per capita (FEC)</b>	Thousand tons o.e. per capita	0,38	0,48	0,57	0,32	0,38	0,42	0,42	0,50
<b>Energy consumption per capita (SPE)</b>	Thousand tons o.e. per capita	1,11	1,33	1,22	1,13	1,10	0,89	1,06	1,14

Source: Expert calculations based on NSC KR data.

The decrease in the energy intensity of GDP with an increase in energy consumption per capita (by 46% for CEP and by 16% for SPE) reflects a change in the distribution of fuel and energy consumption in the country.

## Renewable sources of energy

Since 2010, the share of RSE within total amount of supplied primary energy has been decreased by 3,3%, while hydropower generation has been increased by 27% (736 thousand tons of n.e.) to 3451 thousand tons of n.e.

### Share of renewable sources of energy

	Unit	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total amount of supplied primary energy (SPE)	1000 t o.e.	5095	5852	7100	6685	6326	6245	5206	6315	6911
Hydropower	1000 t o.e.	2715	3447	3418	3156	3207	2676	2770	3424	3451
In % to SPE	%	53,3	58,9	48,1	47,2	50,7	42,8	53,2	54,2	49,9
Biomass	1000 t o.e.	2,8	1,6	168,4	169,9	169,6	2,0	0,6	1,7	1,8
In % to SPE	%	0,1	0,0	2,4	2,5	2,7	0,0	0,0	0,0	0,0

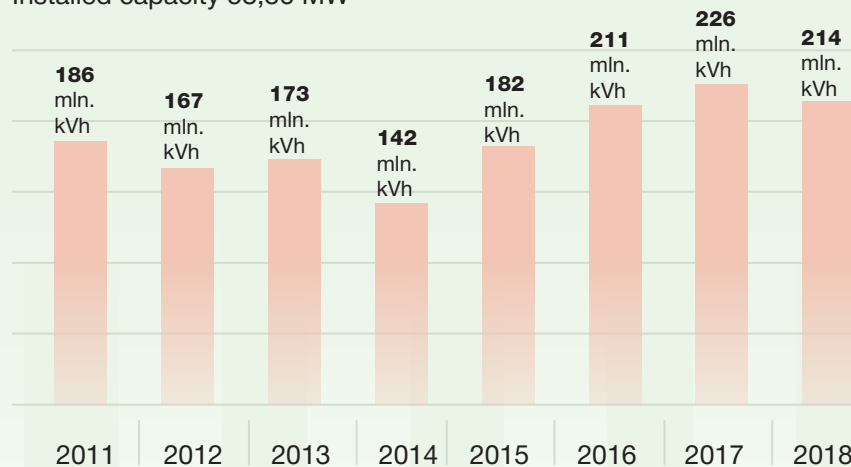
### TOTAL ENERGY OF RENEWABLE SOURCES OF ENERGY

Total amount of supplied RSE	1000 t o.e.	2718	3449	3586	3326	3377	2678	2771	3425	3453
In % to SPE	%	53,3	58,9	50,5	49,8	53,4	42,9	53,2	54,2	50,0

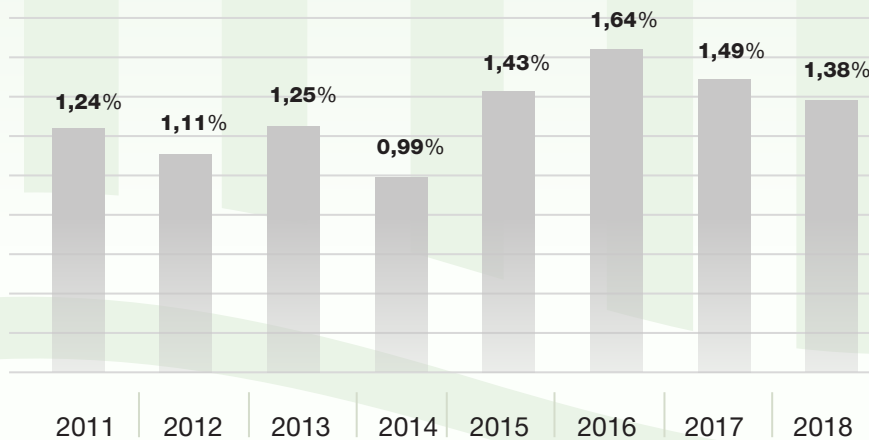
**Generation of electric power by small HPP (RSE under installed capacity to 30 MW) and their share in total amount of power generation**

**TOTAL**

Installed capacity 53,86 MW



**% OF TOTAL GENERATION**



## 8. TRANSPORT

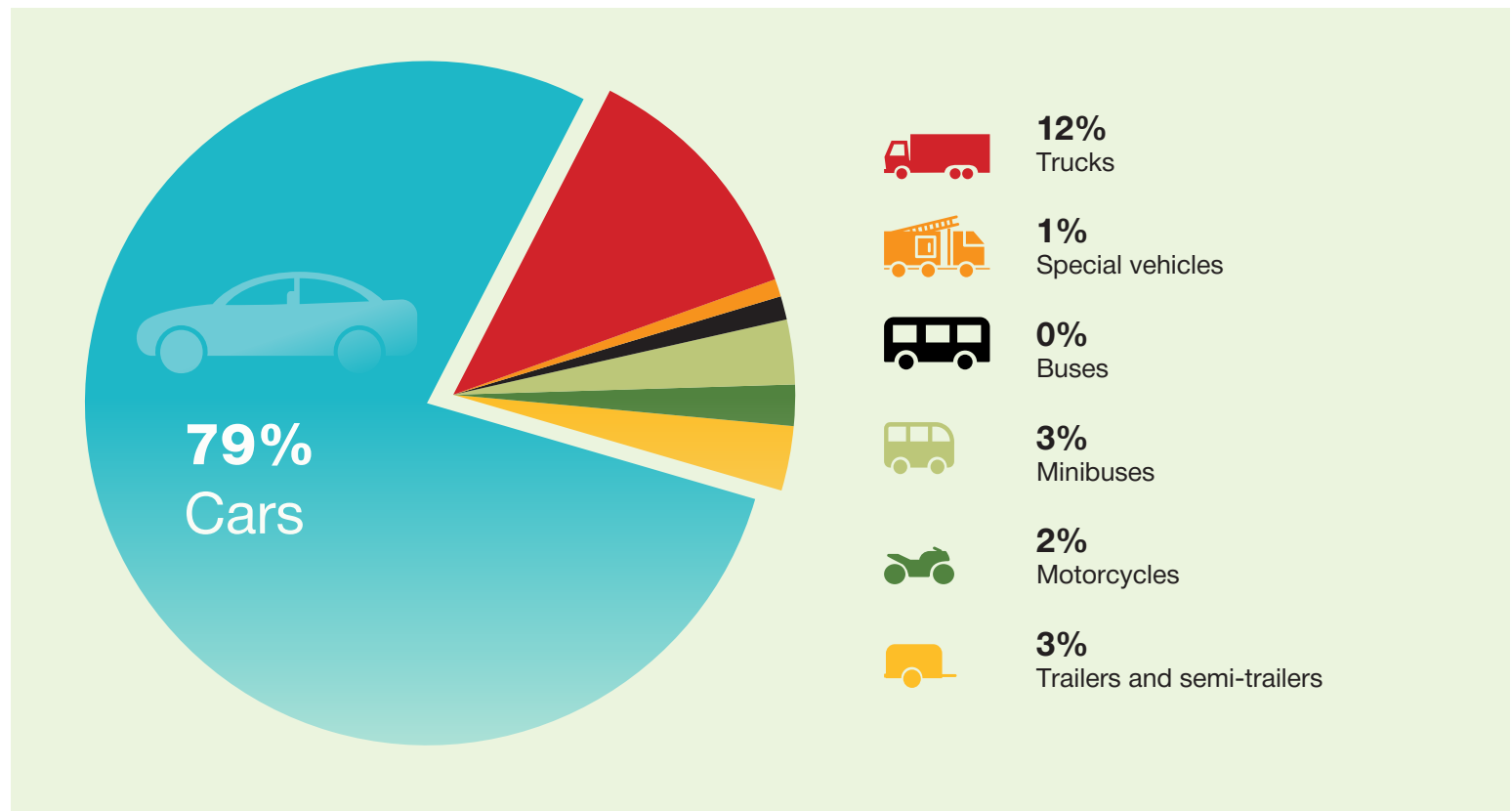
The transport complex of the Kyrgyz Republic is presented by the railway, automobile, pipeline, air and water types.

In the conditions of high mountains and inaccessible regions in the Kyrgyz Republic, auto transport is the main type of transport, and more than 94% of cargo and 97% of passenger transportations are carried out by road.

### Total number and age composition of auto and moto transport means
















The automobile park of the Kyrgyz Republic is about 1,3 million vehicles, including about 1 million cars, 170 thousand trucks and about 50 thousand buses and minibuses. In the second half of the 90-s of the last century, all motor transport companies were completely privatized and they are actually the private now. As of January 1, 2019, there are 995 bus routes in the Kyrgyz Republic, of which 20 are international, 282 are intercity, 420 are suburban, and 273 are urban. The total length of the routes is 55 thousand km. that are served daily by about 10 thousand buses.

### Number of cars and transport means by their types, in percentage

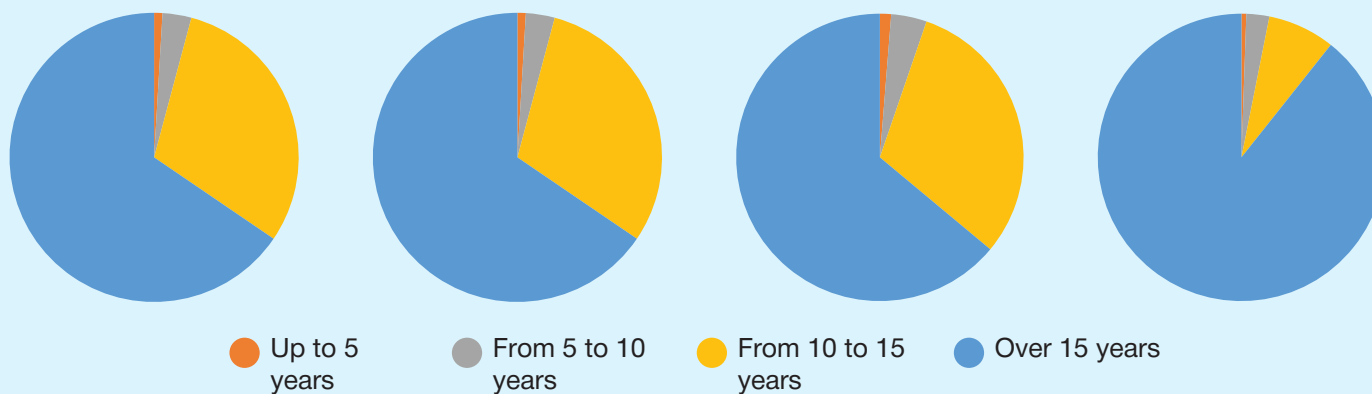


Source: State enterprise "Unaa" under the State Registration Service

## Number of the registered cars, trucks, buses, minibuses in the Kyrgyz Republic by years of their production, units

	to 5 years	from 5 to 10 years	from 10 to 15 years	over 15 years
<b>01.04.2016</b>				
 passenger car	5894	27534	287285	572380
 truck	3860	5363	31731	95013
 minibus	279	1147	7743	31622
 bus	84	717	80	6080
<b>01.01.2017</b>				
 passenger car	7163	30819	290943	572929
 truck	4140	5889	33299	96548
 minibus	328	1240	7957	31856
 bus	130	737	91	6075
<b>01.01.2018</b>				
 passenger car	8905	35416	298465	575308
 truck	4659	7104	36358	99543
 minibus	368	1295	8209	32163
 bus	166	864	288	6236
<b>01.01.2019</b>				
 passenger car	4578	21272	87695	899226
 truck	1272	9021	14451	181497
 cargo and passenger	110	264	622	3307
 bus + minibus	178	625	3174	36202

## Data on number of registered all types of transport means in the Kyrgyz Republic for 2015-2018 by age of production, units



Types of transport means	Total transport means, units	Years of operation of transport means			
		Up to 5 years	From 5 to 10 years	From 10 to 15 years	Over 15 years
<b>DATA FOR 2015 ON 01.04.2016</b>					
All types of transport means	1076812	10037	34761	326839	705095
Share by age from total number of transport means, %	100 %	0,932	3,228	30,352	65,480
<b>DATA FOR 2016 ON 01.01.2017</b>					
All types of transport means	1090144	11761	37971	332290	707408
Share by age from total number of transport means, %	100 %	1,079	3,483	30,481	64,891
<b>DATA FOR 2017 ON 01.01.2018</b>					
All types of transport means	1115347	14098	44679	343320	713250
Share by age from total number of transport means, %	100 %	1,264	4,006	30,781	63,949
<b>DATA FOR 2018 ON 01.01.2019</b>					
All types of transport means	1256748	6848	32446	95025	1122429
Share by age from total number of transport means, %	100 %	0,545	2,582	7,561	89,312

Source: State enterprise "Unaa" under the State Registration Service

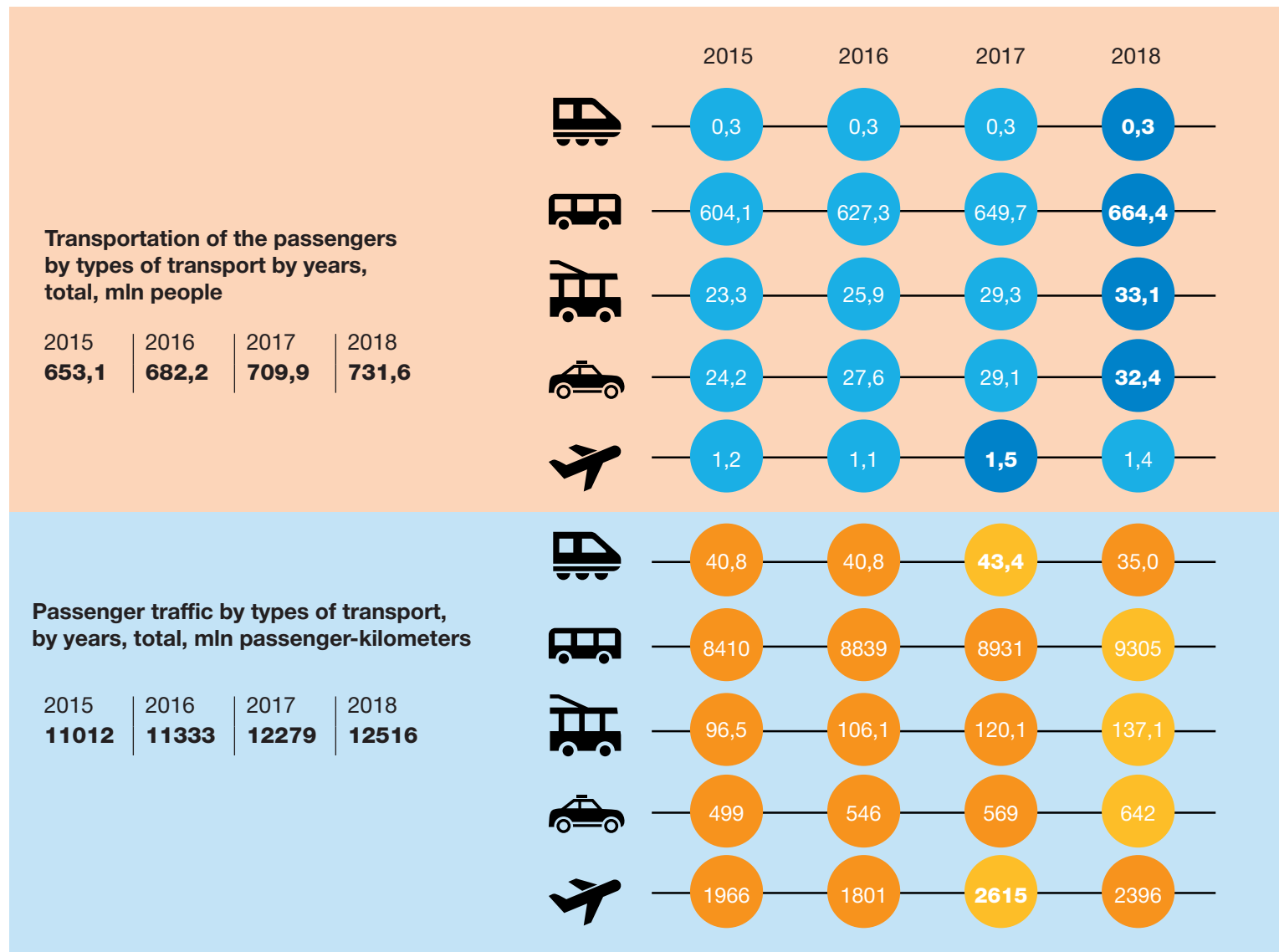
In the period from 2015 to 2018, a total of 38989 units of vehicles were imported to the Kyrgyz Republic, including: tractors 3704 units; motor vehicles purposed to transport 10 people or more, including a driver – 1509 units; passenger cars and other motor vehicles designed mainly for passenger transportation, including cargo-passenger cars-vans and racing cars - 10833 units; motor vehicles for cargo transportation - 22480 units and special purpose motor vehicles - 463 units.



## Passenger turnover

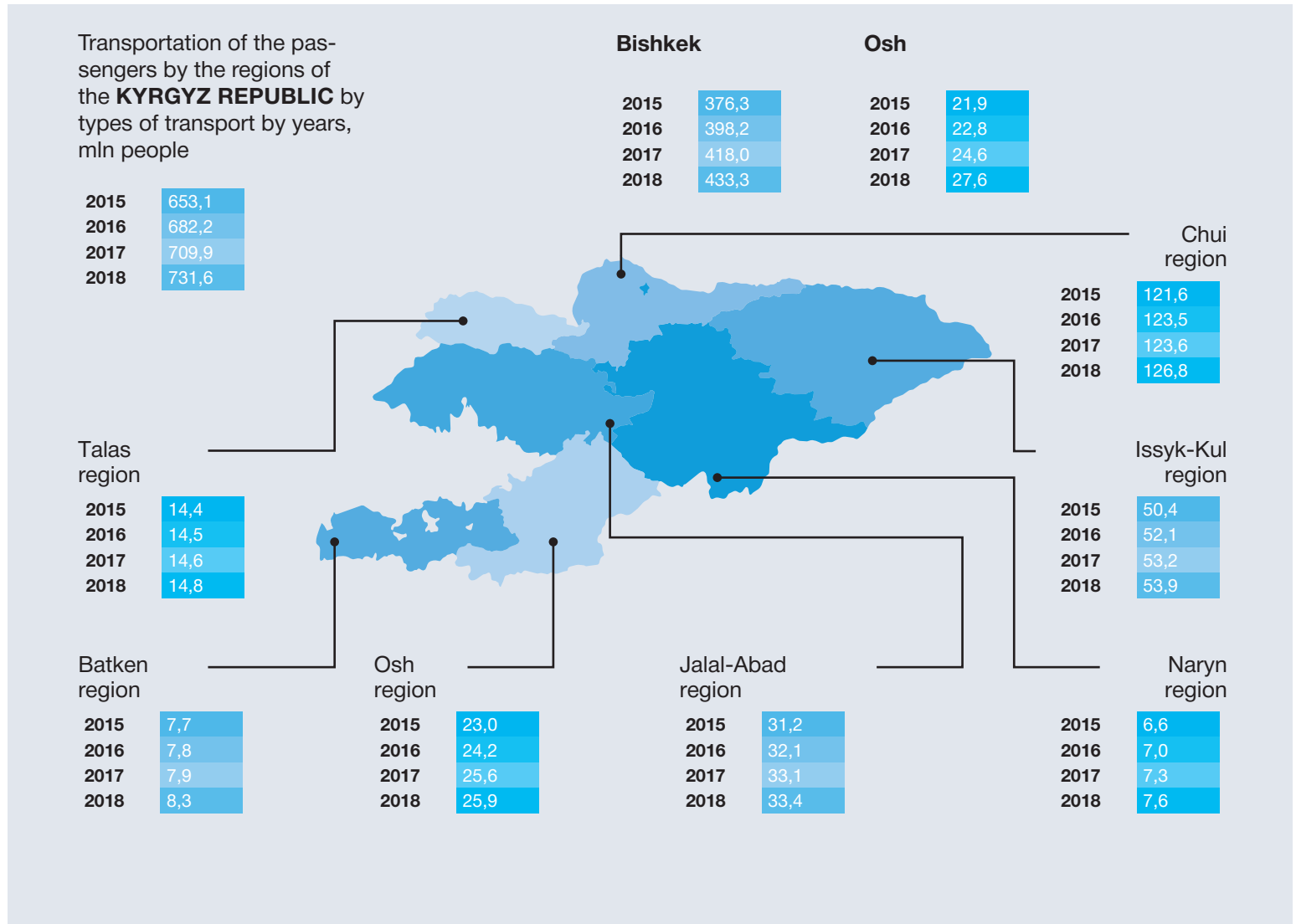
Over the past few years, from 2015 to 2018, passenger traffic by all modes of transport was increased by 13,65%. There is decrease in passenger traffic on rail transport by 14,22% and increase in passenger traffic by buses by 10,64%, trolley buses – 42,07%, taxis – 28,58% and air transport – 21,87%.

## Passenger transportation and passenger traffic by types of transport



Passenger transportation across the territory of the Kyrgyz Republic by all modes of transport was increased by 12,02% during the reporting period, including in the Batken region by 7,79%, Jalal-Abad – 7,05%, Issyk-Kul – 6,94%, Naryn – 15,15%, Osh – 12,61%, Talas – 2,78%, Chui – 4,27%. In 2018, 57 million more passengers were carried in Bishkek than in 2015, and 5,7 million more passengers in 2018, were carried in Osh in 2018 than in 2015.

## Passenger transportation by all types of transport by the regions



Source: NSC KR

## Cargo transportation and cargo turnover

In 2018, the volume of cargo transported by all modes of transport amounted to 33024,0 thousand tons and compare to 2015 it was increased by 3364,4 thousand tons, or in 2018, the increase in cargo transportation was more than 11,5%.

### Cargo transportation by types of transport

Name of indicator	2015	2016	2017	2018
<b>Cargo transportation by types of transport by years, total thousand tons, including:</b>	<b>29659,6</b>	<b>31233,5</b>	<b>31945,4</b>	<b>33024,0</b>
<b>Land transport:</b>				
railway <sup>1</sup>	1278,6	1699,5	1935,7	2257,9
automobile <sup>2</sup>	28159,5	29321,0	29783,2	30515,2
pipeline transport	208,8	2103	226,2	249,9
water transport	12,2	2,6	-	-
air transport	0,2	0,1	0,3	1,0

Where: <sup>1</sup>- at the time of shipment; <sup>2</sup>- since 2014 without consideration of the sector-based transport

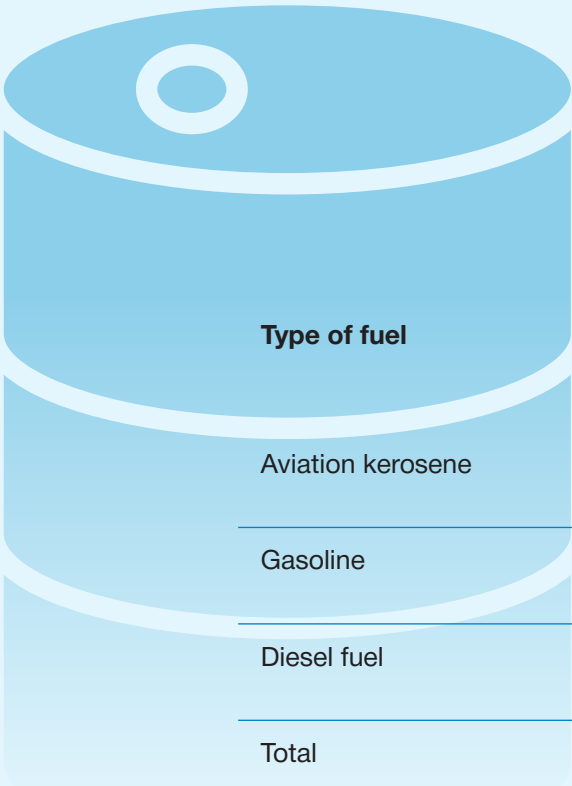
Source: NSC KR

## Consumption of fuel and energy resources in the transport sector

In recent years, there has been a sharp and steady increase in the number of cars and motor vehicles. The consumption of gasoline and diesel fuel was increased by 1.2 times and 1.4 times, respectively, in 2018 compared to 2015, while the consumption of aviation kerosene was decreased by 3 times.

Total consumption of fuel and energy resources was increased by 300.1 thousand tons from 2015 to 2018 in the Kyrgyz Republic.

## Dynamics of consumption of fuel and energy resources in the Kyrgyz Republic



Type of fuel	Measuring unit	Fuel consumption by years			
		2015	2016	2017	2018
Aviation kerosene	Thousand tons	18,3	29,3	21,8	6,1
Gasoline	Thousand tons	689,7	739,0	691,5	791,8
Diesel fuel	Thousand tons	539,8	481,5	619,8	750,0
Total	Thousand tons	1247,8	1249,8	1333,1	1547,9

Source: NSC KR

## 9. WASTE

Impact of human activity waste on environment depends on volume of generated waste, its composition, quantity of illegally buried and disposed waste, as well as their recycling and disposal. Waste management will depend on how these factors will be changed. Today, the final waste processing supposes either dumping it in a landfill or incineration, which in both cases has a negative impact on environment.

### **Waste generation and management**

At the end of 2018, about 135,7 million tons of production and consumption waste was accumulated on the territory of 259 enterprises of Kyrgyzstan, not including waste from mines and open pits, which amounted to about 2 billion tons<sup>2</sup>. Despite the fact that the main part of enterprises (more than 55%) is accounted for by processing industries (144 enterprises), the share of their waste volume is insignificant and only 1,1% of the total waste volume. Along with this, the share of waste from mining (13 enterprises) is more than 95%, this is due to the presence of large enterprises for the extraction of precious metals, coal, crude oil, and natural gas. This trend is also observed in the dynamics over the last four years.

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<sup>2</sup> In accordance with the Resolution of the Government of the Kyrgyz Republic On making amendments in the Resolution of the Government of Kyrgyz Republic “On approval of classification of hazardous waste and methodological guidelines to identify hazardous waste class” as of January 15, 2010 № 9 from 2018 including waste from “Mining dumps”.

**Number of reported economic entities generating production and consumption waste, by types of economic activity, by the end of the year, thousand tons**

	2015		2016		2017		2018	
	Number of entities	Volume of waste	Number of entities	Volume of waste	Number of entities	Volume of waste	Number of entities	Volume of waste
<b>Total</b>	347	114 910,5	351	120 929,6	274	128 419,8	259	135 753,7
including: extraction of minerals	15	106 470,7	14	114 617,8	13	122 000,3	13	129 188,2
Processing industry	199	3 510,0	205	1 272,1	156	1 533,9	144	1 539,8
Energy, gas, steam and conditioned air supply	17	4 916,1	20	5 026,1	17	4 885,2	17	5 025,2
Water supply, treatment, processing and recycling	16	13,7	11	13,6	10	0,4	10	0,4
Construction	15	0,0	18	0,0	16	0,0	12	0,0
Wholesale and retail trade; car and motorcycle repair	18	0,0	18	0,0	15	0,0	15	0,0
Transportation and cargo storage	10	0,0	10	0,0	3	0,0	5	-
Other	84	0,0	55	0,0	44	0,0	43	0,0

Source: NSC KR

A significant part of the waste is disposed on the territories of enterprises (124 waste disposal sites). On average, about one per cent of the volume of waste generated per year is delivered to other enterprises, mainly for utilization or disposal. Waste is transported and disposed mainly to urban landfills.

The volume of utilization of generated production and consumption waste at the enterprises themselves amounted to more than 46% in 2015 and 38,6% in 2018.

A significant volume (95%) of production and consumption waste is accounted for in the Issyk-Kul region, where 28 waste disposal sites are located with an area of 662,9 hectares with 129 million tons of waste.

The Jalal-Abad region has the largest number of landfills (27), where about 10,9 thousand tons of production and consumption waste were disposed on the territory with a total area of 67,9 hectares.

## Solid household waste

The major mass of solid household waste consists of waste paper, glass, not suitable for further use, household items, food waste, apartment and street lights, construction debris left over from the current repair of apartments, broken household accessories and items.

In the Kyrgyz Republic in 2018, more than 1047,8 thousand tons of solid household waste were removed, which are disposed in 406 waste dump sites and landfills. 29% of the total quantity of household removed waste, is concentrated in Bishkek with a population of 1027,2 thousand people and about 33% – Osh with a population of 299,5 thousand people. In 2018, 162,9 kilograms of solid household waste per year were accounted for per capita Kyrgyzstan as a whole.

In urban settlements, the largest share of households disposed of garbage by using containers (79,8%) and dumping it in garbage heaps (28,6%), in rural areas, the main share of households 46,5% - burned garbage, 26,2% - dumped it in garbage heaps and 17,8% - buried it.

## Ways of waste removal from the households, in percentage of total

	2015	2016	2017	2018
The Kyrgyz Republic	100	100	100	100
Garbage chutes	0,1	0,1	0,1	0,1
Truck, container removal	30,6	31,3	38,8	44,0
Waste dumps	29,0	22,4	21,8	20,2
Burning	29,8	32,9	28,6	25,6
Burying	10,6	13,4	10,9	10,0

As can be seen from Table 9.12, the largest share of the households dispose of garbage by truck or container (from 30,6% to 44,0%), which indicates improved access to public services. The second largest method of getting rid of garbage is burning (from 29,8% to 25,6%). The smallest share of households disposes of garbage through garbage chutes (0,1%).

In rural area, the largest share of rural households (41,0%) removes garbage by burning (in the Talas region – 69,9%, in the Jalal-Abad region – 52,3%), while in urban settlements, such households account for 3,6% (in the Batken region – 7,9%). And, opposite, to collect garbage by truck or container – 81,1% (in Bishkek – 97,6% and Osh – 89,0%), is the most common way to remove household waste in urban settlements, while in rural areas this figure is 18,2%.

According to the inventory conducted in 2018, there were 406 landfills in Kyrgyzstan, which cover about 616,306ha.

During the inventory, the approximate (visual technique) morphological composition of the disposed waste was determined. In the landfills of large settlements of the Kyrgyz Republic, the morphological composition of waste includes: plastic – 21%, glass – 10%, construction waste – 14%, food waste – 20%, organic waste – 12%, ash – 11%, metal – 0,5%, paper, cardboard – 1%, textiles – 0,5%, electronic and electrical waste and other waste (medical, biological) – 10%. In Kyrgyzstan, the morphological composition of waste is not identical and varies depending on the level of well-being of the settlement.

In rural areas, the morphological composition of waste disposed in the landfills, mainly contains construction waste, dead animal carcasses, agricultural waste, etc. Informal waste pickers select a portion of valuable waste fractions directly into garbage sites, however, waste collected by garbage trucks, contains 28% of valuable fractions from which waste is 10%; glass 8%; metal – 1%; plastic – 8%; textiles – 1%. 49% of the total composition of municipal waste is organic waste, other waste – 22%.

### **Utilization of worn tires**

Problem of recycling rubber-technical products and worn tires is of great environmental and economic importance for all developed countries of the world. This problem is also relevant for the Kyrgyz Republic. According to statistics, in 2018, imports of:

- new pneumatic rubber tyres and tires amounted to 930,467 units;
- pneumatic rubber tyres and tires, restored or used; solid or semi-pneumatic tires and tires, tire treads and rim belts, rubber totaled 655,227 units.

In recent years, there has been a tendency to increase the import of pneumatic rubber tires and tires, which are already potential hazardous waste at the time of import.



## Export and import of worn tires

	2015		2016		2017		2018	
<b>Pneumatic rubber tires and tyres</b>								
	Pcs.	thousand USD	Pcs.	thousand USD	Pcs.	thousand USD	Pcs.	thousand USD
Export	11460	9704	57447	6196,4	44311	4162	4582	324,5
Import	256 241	26 237,3	654 051	34 830,5	1 045 862	42 102,4	930 467	42797,8
<b>Pneumatic rubber tires and tires, restored or used; solid or semi-pneumatic tyres and tires, tire treads and rim belts, rubber</b>								
	Pcs.	thousand USD	Pcs.	thousand USD	Pcs.	thousand USD	Pcs.	thousand USD
Export	29	4,3	11031	118,2	440	17,6	44	3
Import	439 095	5491,5	30 603	229,2	290 473	2847,5	655 227	5642,2

Source: NSC KR

## Radioactive waste

In Kyrgyzstan, according to the Ministry of Emergency, there are 60 sites, including 33 tailings sites and 27 mining dumps on an area of 450,6 hectares. The total volume of waste is 12,27 million cubic meters, of which 6,57 million cubic meters are radioactive waste.

In Mailuu-Suu, there are 23 tailings sites and 13 mining dumps of uranium production. The total volume of waste is 3,1 million cubic meters, generated and disposed in 1946-1968.

In the Shekaftar town, there are 8 mining dumps with a volume of 0,7 million cubic meters of radioactive waste disposed in 1946-1967. Dumps are located near the residential buildings and schools.

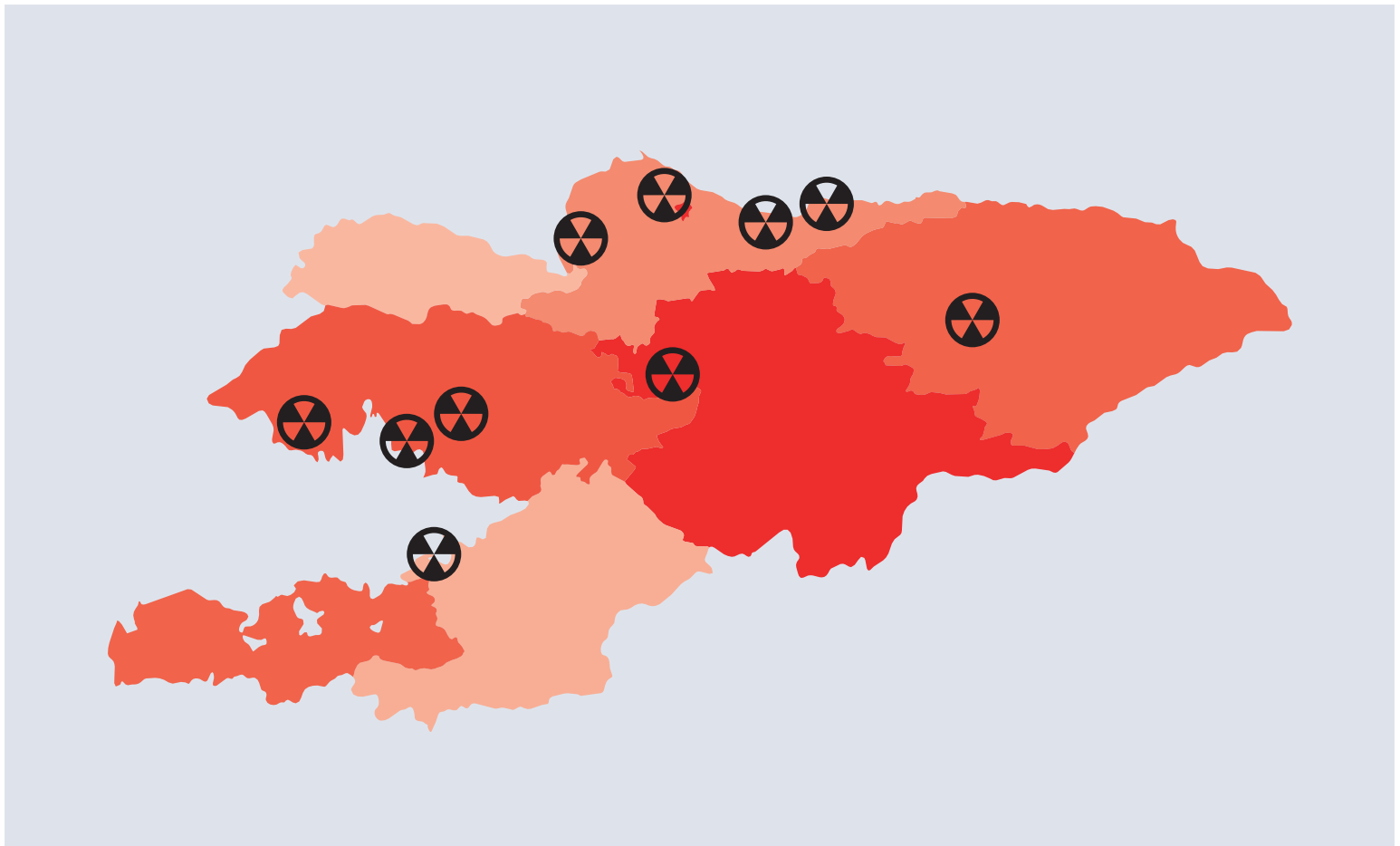
Three tailing sites are located in the Sumsar village with 4,1 million cubic meters containing heavy metal salts (toxic). Two tailing sites are in dead storage. Waste was generated between 1963 and 1969.

There are 4 tailings sites and 4 mining dumps with radioactive waste from uranium production with a total volume of 2,0 million cubic meters on the territory of Min-Kush town.

In the Kan village, there are 2 tailings sites with a total volume of 1,6 million cubic meters containing heavy metal salts (toxic waste).

The processes of climate change are accompanied by worsening threat of natural disasters – in particular landslides and floods, development of landslide processes in the areas of radioactive waste and accordingly, increases the threat of their destruction with catastrophic environmental consequences of cross-border scale.

### Location of radioactive tailing sites and mining dumps in Kyrgyzstan



Source: Inventory of mining waste in the Kyrgyz Republic

## 10. ENVIRONMENT PROTECTION MANAGEMENT AND FINANCING

### Financing of environment protection

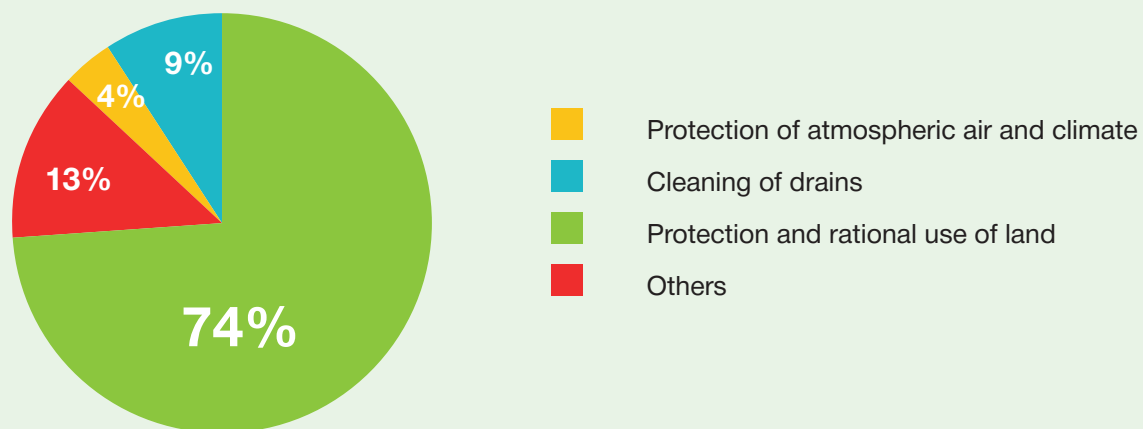
An adequate financing is required to conserve the natural systems and ensure environmental security. A share of investment in the fixed capital for environmental protection to the total investment volume in Kyrgyzstan was increased in 2018 compare to 2014 (0,6%), it is equal to 0,9%.

### Investment of the enterprises and organizations in environment protection, mln som

	2014 г.	2015 г.	2016 г.	2017 г.	2018 г.
<b>Total, including for:</b>	646,7	826,4	1 196,6	4285,3	1 296,1
Protection of the air and climate	16,9	17,2	0,8	2998,5	46,3
Waste water treatment	115,5	111,4	114,5	143,2	120,0
Land protection and rational use	508,6	696,5	1 080,1	1142,0	954,7
Other	5,6	1,3	1,2	1,6	175,1

Source: NSC KR

### Share of investment to the enterprises and organizations for environmental protection in 2018, in percent



Source: NSC KR

## Expenses of the public budget for environmental protection, mln som

	2014	2015	2016	2017	2018
<b>Total, including for:</b>	<b>665,9</b>	<b>810,1</b>	<b>934,5</b>	<b>921,5</b>	<b>962,4</b>
Control of environmental pollution	56,2	71,5	60,4	52,7	64,1
Natural reserves and natural parks	93,3	114,1	145,8	131,7	136,5
Animal protection	8,4	9,4	10,4	9,8	10,4
Plant protection	1,6	1,5	1,5	-	-
Anti-epizootic measures	61,2	46,6	109,3	105,6	153,6
Veterinary diagnostics	109,3	107,2	150,8	134,6	245,1
Chemicalization, plant protection and quarantine	42,5	60,1	88,8	85,9	132,2
Other services on biodiversity protection and landscape protection	277,1	392,6	358,6	231,4	212,8
Scientific-research and development projects related to environmental protection	6,7	7,1	6,3	6,3	-
Issues of environmental protection, which are not attributed to other categories	9,6	-	-	163,5	-
Other services on environmental protection	-	-	2,6	-	7,7

Source: NSC KR

Despite a small annual increase in funding, current expenditure on environmental protection from the public budget for 2018, these costs amounted to only 0,6% of the total state budget expenditures, although the level of GDP was increased by almost 30% with 400 694,0 million som in 2014 to 557 113,3 million som in 2018. Accordingly, the amount of allocated funding is not enough to fully implement all the necessary nature protection interventions.