



Outdoor air pollution – SDGs in action

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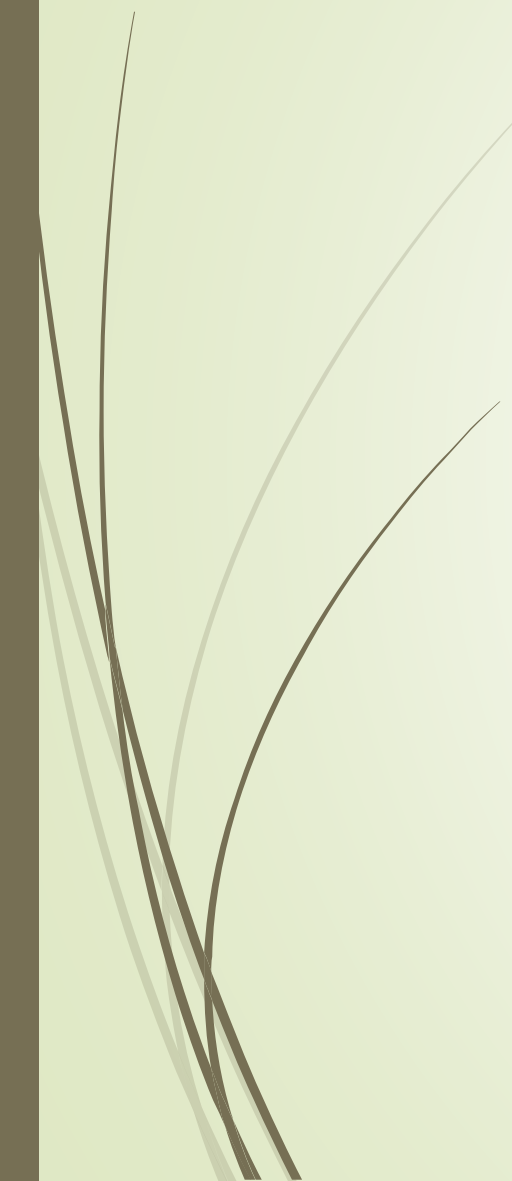


Introduction

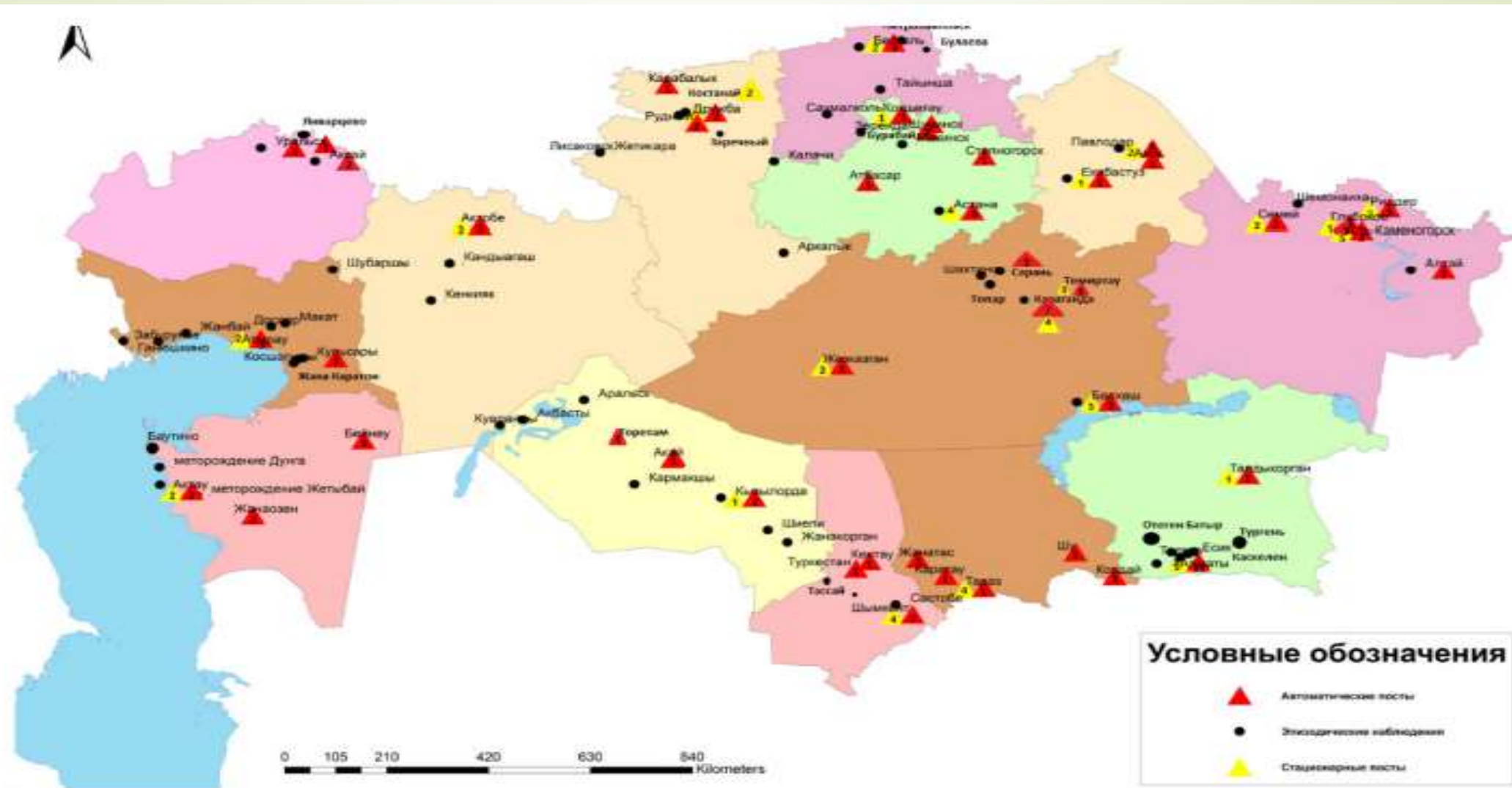
- ▶ The atmosphere is a huge air system. The purpose of the atmosphere in the Earth's ecosystem is to provide humans, animals and plants with vital gas elements (oxygen, carbon dioxide).
- ▶ Emissions of pollutants affect air quality, ecosystem sustainability and human health.
- ▶ The responsible state body for the formation of data on emissions of pollutants into the atmospheric air is the Bureau of National Statistics of the Agency on strategic planning and reforms of the Republic of Kazakhstan. Information is generated based on the results of nationwide statistical observation in the form 2-TP air (annual).
- ▶ The indicators are formed in accordance with the "Methodology for the formation of indicators of environmental statistics", approved by the Order of the acting Chairman of the Committee on Statistics of the Ministry of National Economy of the Republic of Kazakhstan No. 223 dated December 25, 2015.
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- ▶ *National Report about the state of the environment and on the use of natural resources of the Republic of Kazakhstan for 2020*

1.1. EMISSIONS OF POLLUTANTS INTO THE ATMOSPHERIC AIR FROM STATIONARY SOURCES

- A significant part of the population of Kazakhstan lives in the zone of direct influence
- harmful production factors, the main of which are emissions of pollutants into the atmospheric air.
- In 2020, emissions of pollutants into the atmospheric air from stationary sources amounted to 2,441 thousand tons, and their level decreased by 1.7% (in compare with 2019).
- The main volumes of pollutants were formed in the territories
- Pavlodar (723 thousand tons), Karaganda (627.7 thousand tons), Atyrau (154 thousand tons),
- Aktobe (135.1 thousand tons) and East Kazakhstan (127.2 thousand tons) regions. This is due to the large concentration of industrial enterprises in these regions.

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- ▶ The main substances polluting the atmospheric air of the Republic of Kazakhstan are solids (dust and ash), sulfur dioxide, nitrogen oxides (in terms of NO₂), carbon oxides, VOCs, ammonia, hydrogen sulfide.
 - ▶ According to the Bureau of National Statistics of the Republic of Kazakhstan, in 2020 the air basin of the republic received such specific pollutants as lead and its compounds in amount of 369.6 tons, manganese and its compounds - 91.9 tons, copper oxide - 424.9 tons, acid sulfuric - 364 tons, arsenic - 27.3 tons, chlorine - 56.1 tons, mercury - 189 kilograms.
 - ▶ Actual the release of these substances did not exceed the amount of established maximum allowable emissions

Scheme of location of observation points for the state of atmospheric air on the territory of the Republic of Kazakhstan



Источник: Информационный бюллетень РГП «Казгидромет» за 2020 год.

Indicators determined by the RSE "Kazhydromet" at stationary posts and with mobile laboratories

взвешенные частицы (пыль)	взвешенные частицы PM-2,5	взвешенные частицы PM-10	диоксид серы	растворимые сульфаты	диоксид углерода
оксид углерода	диоксид азота	оксид азота	озон (приземный)	сероводород	фенол
фтористый водород	хлор	хлористый водород	углеводороды	аммиак	серная кислота
формальдегид	метан	сумма углеводородов	н/о соединения мышьяка	кадмий	свинец
хром	медь	бензол	этилбензол	бенз(а)пирен	бериллий
марганец	кобальт	цинк	никель	гамма-фон	ртуть

Источник: Информационный бюллетень РГП «Казгидромет» за 2020 год.

- ▶ The state of air pollution was assessed based on the results of analysis and processing of air samples taken at stationary observation posts.

An assessment of the state of atmospheric air pollution in the territory of the Republic of Kazakhstan was carried out in terms of the standard index and the highest frequency in accordance with RD 52.04.667-2005 "Documents on the state of air pollution in cities to inform government agencies, the public and the population."

- ▶ **Air pollution indicators**

- ▶ The degree of atmospheric air pollution with impurities is estimated by comparing the concentration of impurities with MPC (in mg/m³, µg/m³).
- ▶ Three indicators are used to assess the level of atmospheric air pollution for the year for air quality:
 - ▶ – **standard index (SI)** – the highest maximum single concentration of any pollutant measured in the city, divided by MPC;
 - ▶ – **the highest frequency (NR), %, MPC exceedance** – the highest frequency of MPC exceedance by any pollutant in the city air;
 - ▶ – **air pollution index (API)** – an indicator of atmospheric air pollution.
- ▶ The degree of atmospheric pollution is characterized by three standard gradations of indicators SI, NP, and API.
- ▶ If API, SI and NP fall into different gradations, then the degree of atmospheric pollution is estimated according to API

Assessment of the degree of air pollution


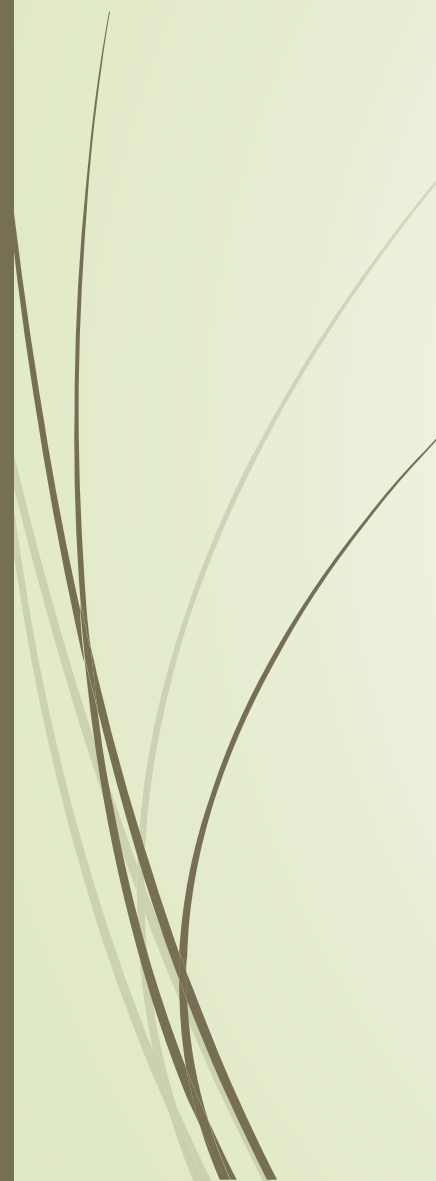
Степень		Показатели загрязнения атмосферы	Оценки за год
Градации	Загрязнение атмосферы		
I	Низкое	СИ НП, % ИЗА	0-1 0 0-4
II	Повышенное	СИ НП, % ИЗА	2-4 1-19 5-6
III	Высокое	СИ НП, % ИЗА	5-10 20-49 7-13
IV	Очень высокое	СИ НП, % ИЗА	> 10 > 50 > 14

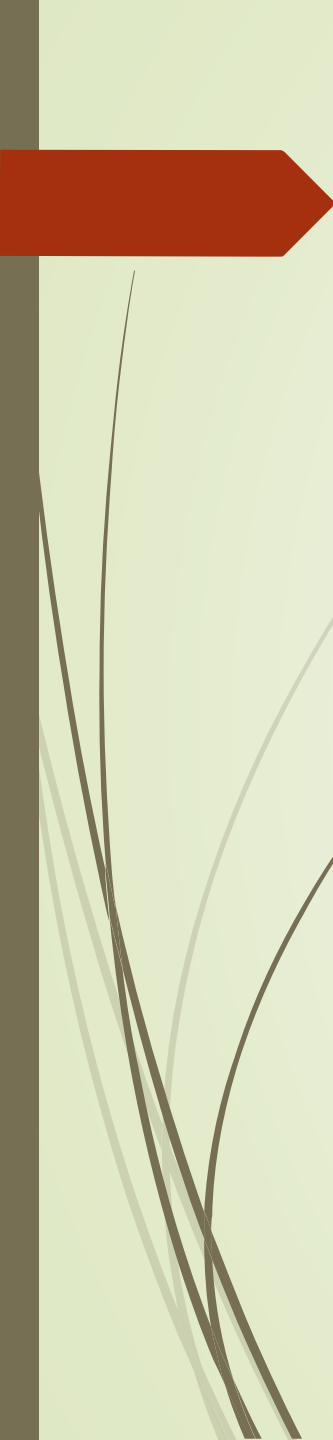
Источник: Информационный бюллетень РГП «Казгидромет» за 2020 год.

API is calculated in accordance with RD 52.04.667-2005. For its calculation, the average concentrations of various pollutants are used, divided by MPC and reduced to the harmfulness of sulfur dioxide.

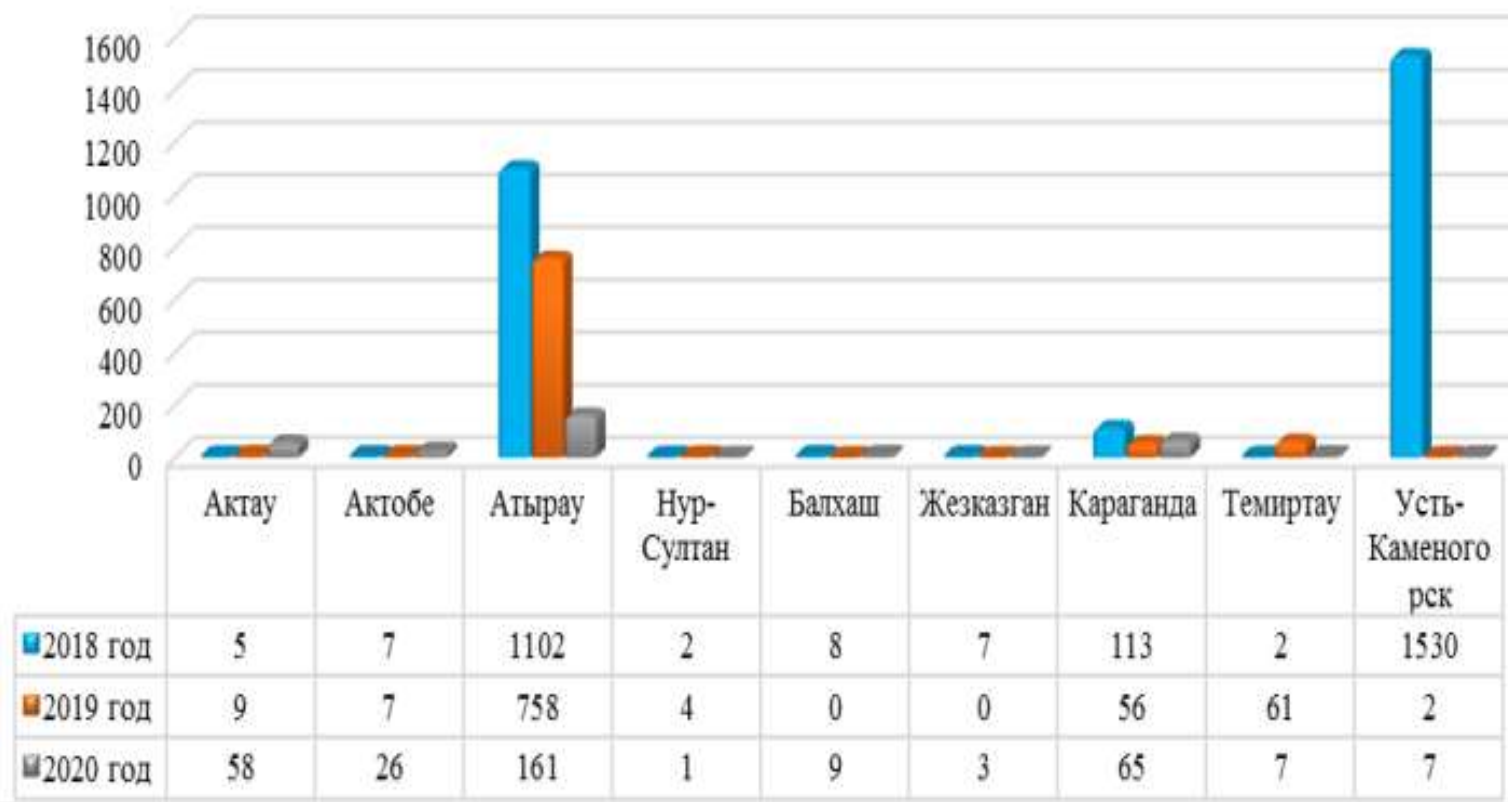
General assessment of atmospheric air pollution

- ▶ According to the observations of the RSE "Kazhydromet" for 2020, to **a high level of pollution (API - 7-13)** include: gg. Temirtau, Nur-Sultan, Almaty, Aktobe, Atyrau, Ust-Kamenogorsk, Karaganda, Balkhash, Zhezkazgan, Shymkent.
- ▶ **The increased level of pollution (API - 5-6)** includes: Ridder, Semey, Saran, Taldykorgan, settlement Glubokoe
- ▶ **A low level of pollution (API - 0-4)** is characterized by: Aktau, Turkestan, Taraz,
- ▶ Petropavlovsk, Uralsk, Pavlodar, Kokshetau, Stepnogorsk, Atbasar, Borovoe SKFM,
- ▶ Shchuchinsko-Borovskaya resort area, Kostanay, Rudny, Zhanaozen, Aksai, Kyzylorda,
- ▶ Kulsary, Karatau, Ekibastuz, Altai, Aksu, Shu, Zhanatas, Kentau and pp. Akai, Kordai,
- ▶ Toretam, Karabalyk, Beineu, Janvartsevo

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- ▶ **The high level of atmospheric air pollution in settlements with pollutants such as sulfur dioxide, hydrogen sulfide, and suspended solids is due to:**
 - ▶ 1) congestion of roads by urban transport, multi-component emissions
 - ▶ gasoline and diesel fuel for vehicles;
 - ▶ 2) dispersion of emissions from industrial enterprises, the result of industrial
 - ▶ processes during the combustion of industrial products is the entire list of harmful substances that cause a high level of air pollution;
 - ▶ 3) low ventilation of the atmospheric space of settlements.

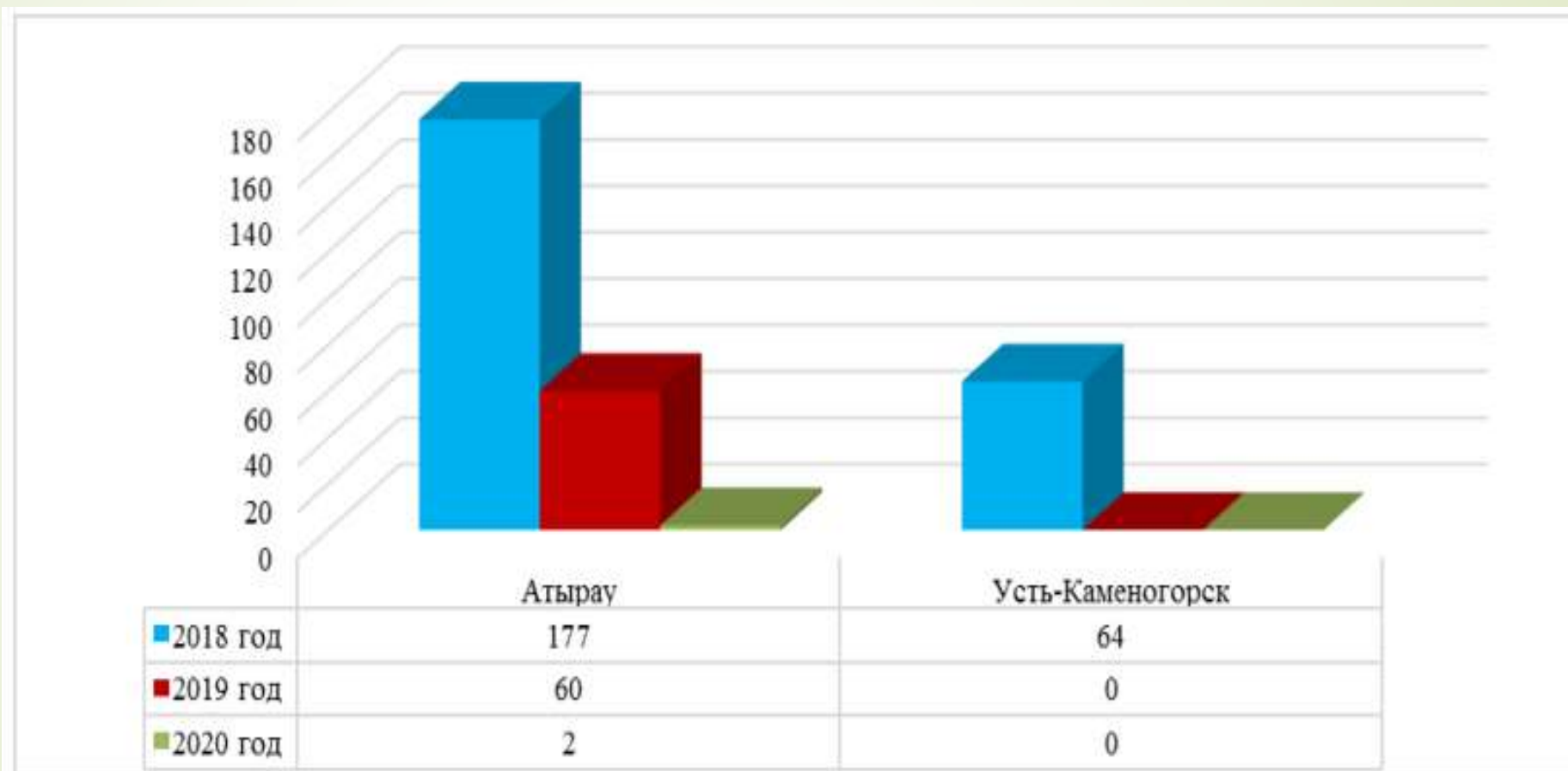
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- ▶ **High pollution (HP)** - the content of one or more substances exceeding
 - ▶ the maximum one-time maximum allowable concentration of 10 or more times.
 - ▶ **Extremely high pollution (EHP)** - the content of one or more substances,
 - ▶ exceeding the maximum one-time maximum allowable concentration by 20-29 times at maintaining this level for more than 2 days; 30-49 times while maintaining this level from 8 hours and more; 50 or more times with a single detection.
 - ▶ According to RSE Kazhydromet, in 2020, 337 cases of high air pollution (HP) and 2 cases of extremely high air pollution (EHP) were recorded, of which:
 - ▶ Nur-Sultan city - 1 case of HP; in Aktobe - 26 cases of HP; in Atyrau - 161 cases of HP and 2 cases EHP (according to NCOC posts), in Ust-Kamenogorsk - 7 cases of EH, in Karaganda - 65 cases of HP, in Balkhash - 9 cases of HP, in Zhezkazgan - 3 cases of HP; in Temirtau – 7 cases of HP; in Aktau - 58 cases of HP

The number of cases of HP in the cities of Kazakhstan for 2018-2020, units



Источник: РГП «Казгидромет».

The number of cases of EHP in the cities of Kazakhstan for 2018-2020, units




Источник: РГП «Казгидромет».

SMOG



Смог над г. Алматы в Казахстане. Фото: Igors Jefimovs/Wikimedia Commons



The World Bank has identified five areas where countries in the region can improve air quality, avoid economic losses and save lives.

<https://blogs.worldbank.org/ru/europeandcentralasia/five-steps-for-cleaner-air-in-central-asia>

➤ **1. Improve air quality monitoring.**

➤ There are different sources of pollution. Different cities and locations have their own specifics. The situation may even differ depending on the time of year or the day of the week. Most of the data available today is a mass of generalizations: averages covering long periods of time and wide geographic areas. Based on such data, it is impossible to develop effective solutions. We need to better monitor the state of atmospheric air and work on the quality of the data we collect in order to accurately know the level of air pollution by certain harmful particles in a particular area, at a particular time of the day and year.

➤ **2. Revision of emission standards for industrial plants.**

➤ The system of environmental permits that set limits on emissions should contribute to both improving air quality and economic growth in the region. Industrial development remains a priority, but should be pursued in ways that are fully consistent with the goals of Green, sustainable and inclusive development.

➤ **3. Gradual transition to cleaner fuels and technologies.**

- In the future, the countries of Central Asia will need to switch to energy sources that will reduce emissions of harmful particles and greenhouse gases into the atmosphere. Environmentally friendly and efficient solutions include the use of solar and wind energy. The initial investment in these is offset over time by the lower cost of energy generated in this way. Improving the efficiency of existing equipment, introducing more advanced technologies in the near future with a further transition to environmentally friendly energy sources - all these steps are realistic and affordable in economic terms.

➤ **4. Incentives for change.**

- The scale of the changes required will require a complete transformation in a number of industrial sectors, in local administrations and even within individual households. To do this, governments can use fiscal incentives – such as green subsidies – and pressure tools in the form of fines for harmful emissions. In order to encourage the purchase of vehicles with a higher standard of environmental friendliness, tax incentives can be used and so-called “reserves” can be created in cities. “Low emission zones”, for which owners of green vehicles pay less, or entry into these zones is limited only to such vehicles.

➤ **5. Strict but achievable time frames.**

- We all would like a quick change for the better, so that we can wake up tomorrow morning, see a clear sky and breathe in fresh, clean air. Unfortunately, this does not happen. All of these steps require formal government commitments, financial investment, capacity building and the introduction of new technologies. With all of this in mind, improving air quality and reducing greenhouse gases by 2030 is quite possible, but a decisive action roadmap is needed to move forward and take immediate action.

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- ▶ In Kazakhstan, World Bank is supporting the government and local authorities in conducting a preliminary study of low-cost and effective air quality management measures. The data collected by this project will help plan further actions to reduce air pollution.
 - ▶ Reducing air pollution will improve human health, reduce greenhouse gas emissions, bring many economic benefits, and save thousands of lives every year.
 - ▶ **Thank you for attention!**