

CLIMATE CHANGE AND RES INTRODUCTION IN UZBEKISTAN: ANALYSIS AND DEVELOPMENT PROSPECTS

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In the Development Strategy of New Uzbekistan for 2022-2026 (goal 79 "Prevention of existing environmental problems that are harmful to the health and gene pool of the population" and goal 80 "Protection of the environment and the environment, improvement of the ecological state of cities and regions, implementation of the national project "Yashil Makon" ("Green Space") set clear objectives for promoting environmental initiatives in the international arena, including the development of a World Environmental Charter; improving the mechanisms for assessing the level of environmental pollution, monitoring the environment, predicting the level of its pollution, constantly ensuring state environmental control, monitoring the state of pollution sources and their impact on the environment; planting at least 200 million tree seedlings annually as part of the national project "Green Space", establishing an aerobiological monitoring system in 10 regions of the republic in accordance with the initiatives of this national project; bringing the level of collection of household waste to 100 percent, their recycling from the current 21 percent to 50 percent in 2026; completion of work on the definition of sanitary protection zones and coastal territories of 51 surface natural water bodies (rivers, small watercourses and natural lakes) in the republic; transformation of the city of Tashkent into a comfortable for the population, ecologically clean area with all conditions for living, bringing the level of its landscaping to 30 percent, etc.

As the successful experience of implementing the Action Strategy for 2017-2021 has shown, Uzbekistan's words do not differ from deeds. Therefore, there is no doubt that such tasks will certainly be implemented. completion of work on the definition of sanitary protection zones and coastal territories of 51 surface natural water bodies (rivers, small watercourses and natural lakes) in the republic; transformation of the city of Tashkent into a comfortable for the population, ecologically clean area with all conditions for living, bringing the level of its landscaping to 30 percent, etc.

At the same time, it is necessary to understand that environmental problems are not solved in a "swoop", their solution is a long and painstaking work that requires significant financial costs and time.

It should be noted that since the first years of independence, the closest attention has been paid to environmental issues in Uzbekistan. This is evidenced by the speech of the President of the country at the international summit "Partnership for Green <https://doi.org/10.5281/zenodo.6607747>

Growth and Global Goals - 2030" (P4G), where the Head of our state again expressed concern about the reduction in the volume of transboundary rivers and the reduction of biodiversity in the region due to climate change, greenhouse gas emissions gases and air pollution.

And in April 2019, the Decree of the President of the Republic of Uzbekistan approved and is implementing the Strategy for the transition of the Republic of Uzbekistan to a "green" economy for the period 2019-2030.

Uzbekistan demonstrates by practical deeds its commitment to fulfilling its obligations to reduce greenhouse gas emissions by 2030 under the Paris Agreement. According to the International Energy Agency (IEA), carbon dioxide emissions from fuel combustion in Uzbekistan have decreased to 85 million tons. According to IEA experts, even if greenhouse gas emissions are predicted to grow by 60% by 2030 from the current level, due to the high rates of economic development and rapid GDP growth, the republic will exceed the level of 10% reduction in the carbon intensity of GDP by 2030, which is in line with the commitments made Uzbekistan.

It should be well noted that stopping the growth of greenhouse gas emissions and, consequently, reducing the negative effects of climate change is possible only within the framework of international cooperation. We are convinced that active cooperation and joint efforts will lead to the achievement of the intended goal - the prevention of dangerous climate change. Therefore, we consider it necessary to discuss forms of expanding cooperation between Uzbekistan and our partners in establishing international cooperation on environmental issues. After all, the life and health of hundreds of thousands of residents and the fate of future generations depend on the speedy solution of these problems today. The government of Uzbekistan is making a lot of efforts to create favorable conditions for attracting foreign investment and environmentally friendly technologies to the country.

Now it is obvious that it is the energy sector that should become the main sector of green changes, where zero greenhouse gas emissions should be set by 2040. This environmental requirement was voiced in last year's report of the International Energy Agency "Zero Emissions by 2050".

A special role in the transition of the energy sector to a "green" economy is played by the development of renewable energy sources.

The Global Electricity Review 2022 study by the think tank Ember shows that the share of solar and wind generation in global electricity generation in 2021 exceeded 10% for the first time. Of these, wind energy creates 6.6%, solar - 3.7%.

In the mentioned study, the transition to clean energy in 2020-2030 implies that in 2030 wind and solar energy will account for 40% of production, the use of coal will decrease by 69%. By 2040, coal should disappear from generation, gas should occupy a negligible share.

Calculations show that the production of wind and solar energy in the world should increase to 15,000 TWh from the level of 2,500 TWh today. Other clean energy sources should provide around 13,500 TWh in 2030, almost doubling the current 7,200 TWh.

The events of recent days have necessitated the accelerated growth of renewable energy in Europe and other regions of the world and the preservation of the rapid pace of transition to alternative energy sources in the coming years.

According to expert estimates, the potential for the use of renewable energy sources (RES) in Uzbekistan is equal to 51 billion tons in oil equivalent. The technologies that exist today make it possible to obtain energy equivalent to 179 million tons of oil, which is more than 2.5 times the amount of fuel produced in the republic, and also prevent the emission of 447 million tons of carbon dioxide, sulfur compounds, nitrogen oxide and other pollutants.

The widespread introduction of "green" technologies and the implementation of projects in the field of "green" energy will allow in the next ten years to increase the share of renewable energy sources in the energy balance of the Republic of Uzbekistan by more than 3 times. By 2026, it is planned to increase the share of renewable energy sources in the structure of generating energy capacities to 25%. We are sure that business circles of leading foreign countries could find mutually beneficial investment niches here.

Last year, the first large-scale solar power plant with a capacity of 100 MW was put into operation in the Navoi region of Uzbekistan. In Karakalpakstan, the foundation was laid for the construction of a wind power plant with an annual electricity generation of 360 million kW, and in the Surkhandarya region, a large solar power plant with a capacity of 457 MW.

There is also a legislative basis for the implementation of these projects. In order to create a legal framework, systematically consolidate priority areas and a set of state policy measures in the field of the use of renewable energy sources, improve energy efficiency in the sectors of the economy and the social sphere, increase the level of diversification of the fuel and energy balance, financial incentives for renewable energy producers, as well as strengthen the energy security of the country back in 2019, the Law of the Republic of Uzbekistan "On the use of renewable energy sources" was adopted.

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One of the environmentally effective steps is to increase the use of electric vehicles. So, in February of this year, the first batch of 20 electric buses has already

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arrived in Tashkent, intended for the fleets of the Toshshahartranskhizmat company. In total, in 2022, it is planned to purchase 390 buses for 741.4 billion soums and 20 electric buses for 6 million dollars for Tashkent. And in 2023-2025, it is planned to purchase another 653 eco-friendly buses and electric buses.

By 2030, the Government of the Republic plans to increase the share of electric vehicles in the total car market to 15%. To do this, the country is creating a full cycle of production of electric vehicles and components based on available natural resources (lithium, graphite and copper). To encourage the purchase and operation of electric vehicles and electric buses, a number of benefits will be provided from April 1, 2022 to April 31, 2030, including exemption from taxes and customs duties.

Currently, about 1,000 electric cars are registered in the country. Their imports in 2021 increased by 6.2 times compared to 2020 - up to 809 units.

In October last year, a plant for the production of electric vehicles of Central Asia Motors began work in Fergana. The project will create more than 350 new jobs. When reaching full capacity, the plant will produce 10,000 electric vehicles per year.

The use of cryogenic technology will give a new impetus to the development of the industry of the republic, since it is known that many nanotechnology complexes are connected and include elements of cryogenic technology.

At the same time, Uzbekistan is conducting scientific research within the framework of the possible use of cryogenic hydrogen or gasoline-hydrogen composite fuel. The advantages of hydrogen as a fuel are related not only to the fact that its combustion generates environmentally friendly water vapor, but also to the fact that, compared to fossil fuels, it has a large energy reserve: when a ton of hydrogen is burned, the same amount of heat is released as when burned 3.5 tons of organic fuel.

These studies are supported at the state level: the Decree of the President of the Republic of Uzbekistan dated April 9, 2021 No. PP-5063 "On measures to develop renewable and hydrogen energy in the Republic of Uzbekistan" was adopted.

Currently, scientific research is ongoing in Uzbekistan, taking into account local conditions. We are talking about the creation of a pilot plant for the production of hydrogen in an environmentally friendly way. It uses electrical energy generated by photoconverters to decompose a water molecule. Encouraging results have been achieved regarding the viability of the chosen technology, since the cost of electrical energy generated by photovoltaic cells is practically on the same level as electrical energy generated by conventional technology.

Our scientific materials on this topic have been published in prestigious scientific journals in the United States and several European countries.

Uzbekistan is interested and is carrying out appropriate work to move away from the model of a resource-intensive economy, leading to an increase in costs and a decrease in productivity, an increase in the negative impact on the environment, a transition to a new model, and the introduction of economic mechanisms in nature management. By the way, the new methodical recommendations developed by us for determining the damage for environmental pollution were published last year in a prestigious American scientific publication.

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Discussing the problem of climate change, it is impossible to avoid the topic of the use of water resources, water scarcity, pollution of watercourses, a decrease in the quality of drinking water, a decrease in the area of glaciers in the Pamirs and Tien Shan, where a significant part of the flow of transboundary rivers of the region is formed, pollution and land degradation, a sharp decrease in biodiversity, deterioration in the state of health and the gene pool of the population. These problems are of current importance not only for Uzbekistan, but for the whole of Central Asia.

In this area, Uzbekistan is taking a whole range of measures, including such measures as the implementation of political decisions in the field of strengthening regional cooperation; improvement of the regulatory framework in the field of environmental protection; development and adoption of development programs and strategies; implementation of investment projects in the water sector; organization of scientific and practical forums with the participation of leading experts in the field of ecology.

In order to improve the drinking water supply and sanitation of settlements, decisive actions are being taken to strengthen the protection of drinking water sources from pollution and depletion, to provide drinking water to hard-to-reach and remote rural settlements, and to improve industrial and domestic wastewater treatment systems in cities and settlements.

Recently, the ameliorative condition of more than 2.2 million hectares of irrigated land has been improved, the area of land with a critical level of groundwater has decreased by almost 10%.

In recent years, special attention has been paid to improving the efficiency of agricultural land use, including with the use of water-saving technologies. As a result of the application of state support mechanisms, only in 2021, water-saving technologies were introduced on an area of 433,000 hectares, and the overall rate of their implementation amounted to 17% of irrigated areas. By the end of 2022, as part of improving the efficiency of water use, it is planned to introduce water-saving technologies on an area of 478,000 hectares.

All this work is carried out in accordance with the recently adopted Decree of the President of the Republic of Uzbekistan No PP-144 "On measures to further improve the introduction of water-saving technologies in agriculture."

Climate change issues cannot be considered without taking into account the consequences of the catastrophic drying of the Aral Sea. I would like to remind you that the tragedy of the Aral Sea is not just a kind of symbol, but the quintessence of man's ruthless attitude towards the environment, his desire to subordinate the laws of nature to his needs. The worst thing is that the drying up of the Aral Sea is not just an environmental problem on a global scale, but a human tragedy for the inhabitants of the Aral Sea region.

Due to natural and climatic conditions, the territory of Uzbekistan is largely prone to droughts and, as a result, to the processes of desertification and land degradation, which are aggravated due to global warming and aridization of the region. The most vulnerable are the regions of ecological risk, which are located in

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the middle and lower reaches of the Amudarya and Syrdarya rivers, including the Aral zone - the Republic of Karakalpakstan, Khorezm, Bukhara, Navoi regions, as well as Kashkadarya region.

Undoubtedly, Uzbekistan today belongs to the category of countries most vulnerable to climate change, and reproaches for the lack of due attention to this issue simply means not understanding the specifics of the region. The Aral Sea was a climate-regulating water body that softened sharp fluctuations in the weather in the region, favorably affecting the living conditions of the population, agricultural production and the ecological situation.

Due to the drying up of the Aral Sea, climatic changes in the sea basin are much more severe than in other regions, 2 times more intense than the average values in the world. The desertification of the territories of the Aral Sea region, accompanied by the processes of degradation of pastures, salinization of soils, as well as the development of eolian processes, led to the formation of a new Aralkum desert, from which millions of tons of dust, sand and toxic salts rise annually, spreading hundreds of kilometers around. About this, in particular, the President of our country Sh.M. Mirziyoyev spoke at the 72nd session of the UN General Assembly.

Significant efforts are being made in Uzbekistan to mitigate the consequences of the Aral catastrophe and develop the Aral Sea region. A number of projects have been implemented aimed at adapting to climate change and mitigating the consequences of the Aral Sea crisis. As is known, in this zone, unparalleled large-scale work is being carried out to improve the socio-economic and environmental situation. On the dried bottom of the Aral Sea, only for the period from December 2018 to March 2022, more than 1.7 million hectares were sown with saxaul seeds (including with the help of aviation).

Planting desert-resistant plants on the dried bottom of the Aral simultaneously solves several important tasks: conditions are created to improve the state of the environment, prevent further degradation of natural resources; the maximum amount of sand retention is ensured on the dried bottom of the Aral Sea; a new ecosystem is being formed; an increase in desert forests and biodiversity will contribute to climate mitigation in this region.

Considering that the drying up of the Aral Sea is not only a regional, but also a global problem, at the initiative of our state, in May 2021, a special resolution of the UN General Assembly "On declaring the Aral Sea region as a zone of ecological innovation and technology" was adopted.

In order to ensure the implementation of this resolution, at the initiative of the head of state, a special resolution was adopted, which approved the "Road Map", which includes 65 priority innovative projects aimed at mitigating the negative impact of the Aral catastrophe on the health of the population and the environment of the region, preserving the Aral Sea gene pool, ensuring environmental sustainability and development of international cooperation in overcoming the crisis of the Aral Sea.

It is obvious that human intervention in natural processes has already gone so far that the associated changes in the environment may be irreversible, and the

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destructive consequences cannot be overcome only by environmental measures. All this requires an understanding of the mechanism of changes occurring in the environment and the identification of those main components that control global processes that determine the state of the environment and its changes over time.

Everyone understands this in Uzbekistan as well. Therefore, we recall that Uzbekistan, as a country that signed the Millennium Declaration, fulfills its obligations to achieve the UN Sustainable Development Goals, recognizing their importance and extreme relevance.