

Features of Increasing the Efficiency of the Industrial Sector Based on the "Green Economy."

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Abstract: *The article analyzes the achievement of increased efficiency in the industrial sector based on the "Green Economy" and the use of effective methods in this direction. Scientifically based recommendations have been developed for the promotion and development of an economy based on a green economy in the regions of Uzbekistan.*

Key Words: *ecological problem, green economy, foreign experience, environmental protection, sustainable development*

Introduction

Since the introduction of a green economy in a country and its regions determines their economic, social, and political development, each region and country sets itself the goal of a faster and more effective transition to this stage. The development of the theoretical and scientific foundations for the implementation of a green economy in the development of regional economies, taking into account regional characteristics, demonstrates the relevance of this issue.

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In the development of production based on the principles of a green economy in the country is a new direction, and attention began to be paid mainly after 2017. The legal and regulatory framework in this area has also been formed since the recent past. These include the Resolution of the President of the Republic of Uzbekistan dated May 26, 2020 no. PP-3012 "On the Program of Measures for the Further Development of Renewable Energy, Increasing Energy Efficiency in Sectors of the Economy and the Social Sphere for 2020-2022," the Decree of the President of the Republic of Uzbekistan dated October 30, 2021 no. UP-5863 "On Approving the Concept of Environmental Protection of the Republic of Uzbekistan for the Period up to 2030." These documents emphasize that the transition to a green economy is one of the strategic directions of Uzbekistan's economy.

Methods

Along with expanding the scale of industry in the republic, there are great opportunities for its development in the areas of greening and ecologization. One such direction is the production of electricity from solar energy. On August 27, 2021, the first solar power plant in Uzbekistan was commissioned in the Navoi region. Its power is 100 MW. This enterprise produces 252 million kilowatts of electricity per year. This facility will save 80 million cubic meters of natural gas per year and reduce greenhouse gas emissions by 160 thousand tons. Uzbekistan is a country rich in solar energy, with 525-760 billion soums. kWh of potential is accumulated. Taking this potential into account, it is planned to increase electricity generation through renewable sources from 10 percent in 2018 to 25 percent by 2030. As a result of inefficient energy use, Uzbekistan's GDP loses an average of 4.5% annually. 40 percent of the country's energy transmission systems have expired and are morally and physically obsolete. The current reserves of energy resources will sharply decrease by 2030, and a large shortage of these resources will be observed.

Results and Discussion

Studies show that the sources of renewable energy resources in the country amount to 270 million tons of standard fuel, which is 3 times more than the annual energy consumption. Solar energy constitutes a large part of these sources. Over the past 10 years, the price of solar energy has decreased by 80% in the global market. In Uzbekistan, the cost of such energy will be even cheaper, because the country has high solar radiation and high lighting. In the republic's industry, chemical production and the mining industry prevail. These industries manage a quarter of the energy consumed in the country, as well as about 80% of natural gas. Industry faces not only the issue of reducing waste and environmental pollution, but also the issue of adapting to rapid changes in global production processes based on environmentally friendly production, innovations, and competitive personnel qualifications. When developing industrial sectors based on the principles of a green economy, incentives such as the production and export of environmentally friendly products, their preferential taxation, subsidized interest rates, and a reduction in VAT will accelerate the processes. The application of low import duties on low-produced and import-substituting goods will strengthen the transformation of industry into green systems and the implementation of green ideas. It is also necessary to reduce the allocation of environmentally harmful subsidies, for example, the amount of subsidies allocated for fuel resources consumed in the energy sector is several times higher than the payments for the pollution of such resources.

It is known that producers are always engaged in profitable industries, in which case it is impossible to multiply any economic process, for example, construction, chemical production, etc. And at the present stage, the state should help entrepreneurs understand the real effectiveness of investments in the "green economy."

Also, domestic products manufactured within the framework of the "green economy" have broad opportunities for export. To this end, governments are increasing support, such as studying the needs of foreign markets and providing this information to local entrepreneurs, and establishing an internationally recognized certification system in the country. All this expands business opportunities to enter foreign markets, where production based on the "green economy" is expanding year by year.

It should be noted that the industrial sector of Uzbekistan is the main source of fuel consumption and greenhouse gas emissions.

Considering the predominance of chemical production and the mining industry in terms of energy consumption in the country's industry, it consumes almost a quarter of the electricity consumed in the country, as well as the largest volume of natural gas. As for greenhouse gas emissions (one of the main causes of climate change), the largest volume of the country's industry is metallurgy, cement production, the chemical and textile industries. And with the development of industry, the volume of greenhouse gas emissions will increase. The way out of this situation is the "greening" industry, the gradual maximum transition to a green economy.

In October 2019, the "Green Economy Transition Strategy of the Republic of Uzbekistan for 2019-2030" was adopted.

The Strategy defines target indicators for reducing emissions by increasing energy efficiency, expanding the use of renewable energy sources, increasing the resource efficiency and yield of agricultural crops, as well as limiting land degradation.

Of course, the stages of transition to a "green economy" will last several years and will be accelerated by the measures that the state offers to producers. However, as the lessons of the COVID-19 pandemic have shown, it is impossible to delay preparations for various scenarios of the current situation. Their connection with the state of the environment is clear, that is, it is time to start "green projects" and gradually expand them.

In turn, the COVID-19 pandemic has clearly shown that public health is closely linked to climate and nature. Lessons of the pandemic for the whole world: sustainable use of natural resources, mitigation of the consequences of climate change, and their implementation is encouraged to start a "green" recovery through adaptation. Today the importance of using the possibility of overcoming the crisis in an environmentally friendly, low-carbon way, where economic recovery can be carried out without increasing greenhouse gas emissions.

Experts believe that in the near future, the sustainable development of a particular country will inevitably depend on the share of renewable energy sources in the energy sector.

Taking this into account, in recent years, large-scale work has been carried out to introduce the "green economy" system into the industrial sectors of the republic, increase energy efficiency in the social sphere and expand the use of renewable energy sources, accelerate innovative development, and rationally use natural resources.

It is no exaggeration to say that the Decree of the President of the Republic of Uzbekistan Shavkat Mirziyoyev "On the Program of Measures for the Further Development of Renewable Energy, Increasing Energy Efficiency in Sectors of the Economy and the Social Sphere for 2017-2021" has raised these efforts to a new level.

In particular, based on the target parameters for the further development of renewable energy, taking into account the predominance of chemical production and the mining industry in increasing the share of renewable energy sources in the electricity generation capacity from 12.7% to 19.7% by 2025, the country consumes almost a quarter of the electricity consumed, as well as the largest volume of natural gas.

At the same time, the resolution provides for the implementation in 2017-2025 of 810 projects for the development of renewable energy with a total value of \$5.3 billion.

In addition, due to the introduction of modern energy-saving technologies at social and agricultural facilities, savings of more than 56.5 million cubic meters of natural gas and more than 807.3 million kWh of electricity will be achieved.

Our country still has insufficiently studied renewable energy sources, which are mainly solar and wind resources, and it is possible to provide clean and sustainable energy. Uzbekistan is expected to become one of the most energy-intensive countries in Central Asia and Eastern Europe. From 2000 to 2015, electricity consumption increased from 46.8 billion kWh to 57.5 billion kWh per year. Calculations show that by 2020 this figure could be 25 percent higher, that is, 71.8 billion kWh.

At the same time, if we consider renewable energy resources in Uzbekistan:

- Solar energy: from 525 to 760 billion. up to kWh;
- Wind energy: up to 1 trillion kWh;
- Hydropower: 21 billion. more than kW·h;

Biomass: 6 billion cubic meters.

Renewable energy still requires considerable time and resources to demonstrate its effectiveness. Let's consider our current main problems in statistical observations. Naturally, the question arises: why is this indicator so high? There are various reasons for the high energy consumption of GDP in our republic, and one of the main reasons is the continued use of physically obsolete technologies in industrial enterprises. This leads to the loss of 60 percent of the energy coming from the primary source in the transmission and distribution systems. In addition, burning gas in flare (torch) devices also means wasting a large amount of money.

According to experts, the transition of Uzbekistan to the "green economy" system requires a systematic approach to reforming and modernizing all aspects of industrial production, agriculture, management, the education system, improving the skills and retraining of personnel, and creating new jobs.

Currently, thermal power plants in Uzbekistan account for about 86% of the electricity generated in the republic. Currently, there are 14 thousand megawatts of power plants in the country. As a result of the population's growing need for electricity, this demand is expected to reach 20,000 megawatts by 2030. These stations consume 17 billion cubic meters of natural gas per year. However, such a large amount of gas can be directed to the processes of creating added value (production of synthetic fuel, polypropylene). Therefore, the main task facing specialists is not only to increase electricity production capacity, but also to expand the scale of green energy production, which is harmless to the environment.

In our country, there are specific projects in this area designed for 10 years. During this period, it is planned to build solar power plants with a total capacity of 5,000 megawatts and wind power plants with a total capacity of 3,000 megawatts.

On February 1, 2020, the Ministry of Energy announced the start of a pilot project for the construction of a photovoltaic power plant in the Sherabad district with the support of the Asian Development Bank. The project is part of a 1 GW solar energy generation program developed in cooperation with this bank, according to which a solar power plant with an alternating current capacity of at least 200 MW, including a new 220 kW substation, and a power transmission line with a total length of 52 km will be laid to connect to the "Surkhan - 500 kW" substation.

Our country is actively continuing direct negotiations with large companies that have offered favorable conditions for participation in renewable energy projects. For example, the French company "Tota Eren" will restore a photovoltaic station in the Nurabad district of the Samarkand region. An agreement on the construction and operation of this facility with a total capacity of 100 MW was signed last fall.

Wind power plants also play an important role in obtaining environmentally friendly energy. Especially in recent years, this energy sector has become one of the most dynamically developing in the world. Power plants, consisting of a wind turbine, an electric current generator, an automatic device for controlling their operation, and structures on which they are installed, convert the kinetic power of the wind flow into electrical energy.

It is often used in areas with high average annual wind speeds and located far from centralized power supply networks. Through such stations, it is possible to generate electricity with a capacity from 8 kilowatts to 1.2 megawatts.

Large investment projects for the construction of wind power plants are being implemented in our country in cooperation with foreign companies. One of them is the project to build a wind power plant with a total capacity of 500 megawatts in the Tamdyn district of the Navoi region with the participation of the United Arab Emirates Company "Masdar." This station is scheduled to be commissioned in 2023.

Within the framework of projects implemented with a foreign company, the construction of two wind power plants with a total capacity of 1000 MW in Bukhara and Navoi regions is also envisaged. The total cost of the project for the construction of these power plants is about 1.3 billion US dollars. The implementation of these projects is expected to reduce hydrocarbon emissions by 1.6 million tons and contribute to achieving the government's goals of transitioning 40% of energy capacity to renewable energy sources by 2031. In the first stage of the process, specialists from the Ministry of Energy, the State Geology Committee, and ACWA Power studied wind flow levels in several regions of the country. The study, which began in August of last year, will last 12 months.

During the events, special measuring instruments at a height of 100 meters will be installed to measure wind speed, direction, and duration, as well as data on changes in weather conditions in the regions.

Local and foreign specialists with high qualifications and experience were involved in these works. In addition, work is underway to conduct topographic, geological, and hydrological surveys in the regions.

An important role in the implementation of these projects is also played by the agreement on the development of hydrogen energy between the Ministry of Energy and ACWA Power. The main goal of Uzbekistan is to combat climate change and reduce greenhouse gas emissions through scientific research in the field of hydrogen and renewable energy.

Uzbekistan plans to increase the share of renewable energy sources (RES) to 25% by 2030. Today, the share of renewable energy sources in the total volume of electricity generated in our country is up to 10 percent, the remaining 90 percent is generated from traditional sources.

According to leading experts in wind energy, Uzbekistan has enormous potential in this area due to its geographical location and climatic conditions.

Specialists of the Ministry of Energy noted that the implementation of the project for the construction and operation of a wind farm in Uzbekistan will allow attracting foreign direct investment in the amount of more than \$600 million and create 1,300 new jobs.

The commissioning of the power plant will allow for the diversification and strengthening of the republic's energy balance by generating 1.8 GW/hour of affordable electricity per year. This will cover the needs of more than 500 thousand households.

The introduction of modern renewable energy technologies will allow reducing the volume of natural gas used in electricity generation to 175 million cubic meters per year. This also means that saved energy resources will be directed to other needs, and carbon dioxide emissions into the atmosphere will be significantly reduced.

Program of measures for the further development of renewable energy

№	Indicators	Joriy qilinadigan energiya quvvatlari(prognoz)			
		2019 yil	2020 yil	2021 yil	2025 yil
	Total	1159,7	2991,5	5222,5	7401,9
	Including:				
1	Traditional energy	802	2409	4218,6	5406
2	Recoverable energy	357,7	582,5	1003,9	1995,9
	Including:				
2.1	Hydropower	157,7	382,5	601,9	1243,9
2.2	Solar energy	200	200	300	450
2.3	Wind energy			102	302

According to the list of investment projects for the development of renewable energy, 810 projects with a total value of 5.3 billion dollars are planned to be implemented in 2017-2025.

The commissioning of the first stage of production capacities (up to 250 MW) is scheduled for April 2023 and the commissioning of all capacities by the end of 2024.

The signing of investment agreements on the above projects will indeed serve as an important factor in reforming the energy sector and the socio-economic development of the country. This will undoubtedly become one of the decisive steps in Uzbekistan's transition to the use of low-carbon waste resources.

Today, increasing the share of renewable energy sources in the country's energy sector is becoming one of the important tasks. The aforementioned large investment projects are among the first steps taken to expand the use of "green energy."

Alternative energy sources, created in cooperation with foreign partners, will provide sectors of the economy, regions, and the population with uninterrupted electricity supply and reduce harmful emissions into the environment.

Conclusion

The transition to a "green economy" is of particular importance for each country and occurs in direct dependence on such characteristics as natural capital, human capital, and the level of economic development of the country.

In the future, economic development is impossible to imagine without innovative technologies. In this direction, the use of alternative energy sources is of particular importance. Thus, based on the new decree of the head of our state, the scale of the work begun in this direction will expand, and its effectiveness will increase.

In conclusion, under conditions of limited resources and the negative consequences of environmental problems, there is an objective need to form a "green economy." The transition to a "green economy" will allow for the efficient use of resources, ensuring ecological balance, creating new jobs, and ensuring sustainable economic growth.

- adoption of government decisions on the widespread use of "green" energy and, on this basis, the adoption and ensuring the implementation of subordinate acts of regional khokimiyats;
- development of proposals and recommendations for the use of energy-saving technologies in the energy consumption of the population and the state;
- development of practical proposals and developments for the construction of "green" houses and buildings;
- it is necessary to reduce the energy intensity of the national economy by modernizing production technologies and developing effective measures aimed at the rational use of energy resources;

It is necessary to form and improve the legal framework for state support and stimulation of the use of renewable energy sources.

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