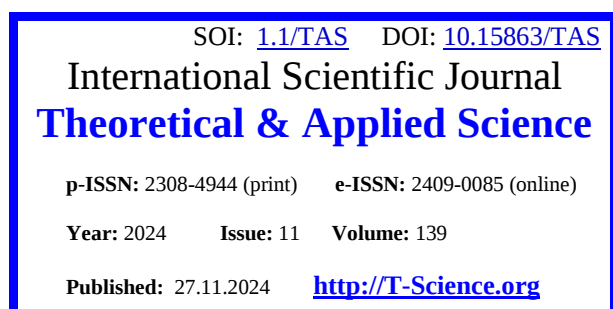




Issue

Article



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GREEN ENERGY AS A DRIVER OF THE NATIONAL ECONOMY: INTERNATIONAL EXPERIENCE AND PRACTICE OF UZBEKISTAN

Abstract: This article is devoted to the investigation of current issues of using renewable energy sources in the current economic conditions. In addition, the authors provide a comprehensive analysis of the role of the green energy in the economy, international experience in the use of “green” energy and consider the prospects for its use in the conditions of Uzbekistan.

Key words: green energy, energy-saving technologies, sustainable development, renewable energy sources.

Language: English

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Introduction

It is a well-known fact that with the increase in population, development of technologies and scientific and technical progress in energy, it is steadily growing. If at the beginning of the XIX century humanity consumed about 5600 TWh of energy per year, then over the next 200 years this figure increased more than thirty times and exceeded 170000 TWh. As of 2019 annual energy consumption per capita ranges from 98 to 105540 kWh depending on the region and this figure continues to go up.

The growth of electricity consumption is directly related to economic development. Taking into consideration the average rate of population growth and energy demand on a global scale, hydrocarbons and other traditional sources may run out in just a few decades. The fact that traditional energy sources are limited and exhaustible by their nature creates the

need to search for alternative solutions, one of which is “green” energy.

“Green” energy is part of an energy-producing system based on renewable natural resources on a human scale. Wind, sunlight, water flows, and biofuels are traditionally considered sources of “green” energy. In addition to the fact that such sources are considered inexhaustible, an unambiguous advantage of such energy sources is their environmental friendliness. Definitely, “green” energy is also called upon to mitigate the negative impact of urbanization and climate change occurring everywhere.

Literature review.

The concept of a “green” economy, which assumes a gradual transition to renewable energy sources for sustainable development, was formulated

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back in 1991 by the British economist Michael Jacobs. The author outlined the main provisions of this concept in the book “Green Economy: Environment, Sustainable Development and Future Policy” [4]. However, Jacobs’ ideas only became widely accepted after the 2008 economic crisis, when the “green” economy began to be considered as an efficient and relevant strategy for restoring the global economy and preventing major shocks in the future. Following this, the issues of green economy and green energy acquired global significance, and the concept of green economy was enshrined in the United Nations Environment Programme (UNEP).

According to Mishina N.A., “Green” energy is a part of the energy-producing system, which basis constitutes inexhaustible or renewable natural resources on a human scale. Green energy sources include wind, sunlight, water flows, geysers, and biofuels. In addition to being inexhaustible, the advantage of such energy sources is their environmental friendliness.[3].

From the point of view of Afakova R.S., “As experts note, at present this direction is seen as the main solution to the issues of carbon dioxide emissions into the atmosphere and global warming in general” [3].

Research methodology.

Based on the goals and objectives of this scientific article, as well as taking into consideration that this research is theoretical in nature, in the process of research such research methods as observation, comparison, analysis, synthesis, and the method of generating ideas have been widely applied.

Analysis and discussion of the results.

According to the “Development Strategy of New Uzbekistan for 2022-2026”, particular attention is paid to the development of “green” energy in our country. The task has been set and is being implemented to bring the volume of electricity produced from renewable sources (RES) to about 11000 MW by 2026.

It is worth noting that the share of renewable energy sources in the global energy balance has increased by 10 percentage points since 2010 to almost 30 percent.

Let’s have a look at the historical development of the green energy throughout the world.

In 2006, about 18 percent of global electricity consumption came from renewable energy sources, with 13 percent coming from traditional biomass sources such as wood burning. In 2010, 16.7 percent of global energy consumption came from renewable sources; in 2015, that figure was 19.3 percent. The share of traditional biomass is gradually decreasing, while the share of renewable energy is growing.

From 2004 to 2013, the share of electricity produced in the European Union from renewable sources increased from 14 to 25 percent. In Germany, 38 percent of electricity was produced from renewable sources in 2018. On May 21, 2023, from 11:00 to 17:00, due to overproduction from alternative sources (wind turbines and solar power plants), the cost of electricity went into negative values in the vast majority of EU countries.

Brazil implements one of the largest renewable energy programs in the world, producing fuel ethanol from sugar cane; the alcohol currently meets 18 percent of the country’s automotive fuel needs. Fuel ethanol is also widely used in the United States.

Hydroelectricity is the largest source of renewable energy, providing 15.3 percent of global electricity generation and 3.3 percent of global energy consumption (in 2010). Wind power is growing at approximately 30 percent per year worldwide, with an installed capacity of 318 gigawatts (GW) in 2013, and is widely used in Europe, the United States, and China.

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Solar power plants are popular in Germany and Spain. Solar thermal power plants operate in the United States and Spain, the largest of which is the 354 MW Mojave Desert plant. Photovoltaic panel production is growing rapidly, with 6.9 GW (6900 MW) of panels produced in 2008, almost six times the 2004 level.

Geothermal plants: The largest in the world is the Geysers plant in California with a nominal capacity of 750 MW.

Large non-resource companies support the use of renewable energy. For example, Apple is the largest owner of solar power plants, and all of the company’s data centers operate on renewable energy sources. The share of renewable sources in the energy consumed by Google is 35 percent and the company’s investments in renewable energy have exceeded billion USD.

According to data from [energystats.enerdata.net](https://www.enerdata.net), in 2022 the share of renewable energy sources in the global energy balance increased again (+1.5 points) up to 30 percent, that is, 10 points higher than the 2010 level. The share of renewable energy sources in the energy balance is traditionally particularly high in countries with large hydro resources, such as Brazil, Colombia, Canada,

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New Zealand, Sweden and Norway (more than 2/3 of generated electricity).

In other countries, ambitious renewable energy policies and falling costs of electricity generation from solar and wind technologies have stimulated renewable energy production and contributed to a significant increase in the share of renewable energy in the energy mix. In Europe, it has risen by 18 points since 2010 to 43 percent, with strong gains in the UK (+36 points to 43 percent), the Netherlands (+30 points to 40 percent), Germany (+27 points to 44 percent) and Turkey (+15 points to 42 percent). The share of renewable energy in the energy balance also increased by 22 points to 31 percent in Australia, by 14 points in Chile to 55 percent, by 12 points in the USA (to 22 percent), China (to 31 percent), Japan (to 22 percent) and Thailand (to 18 percent) and by 8 points in South Africa (to 10 percent) [5].

The current reality is that the issue of using “green energy” is becoming more relevant than ever in light of the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan adopted on April 16, 2024 “On additional measures to introduce market mechanisms in the fuel and energy sector”, aimed at uninterrupted supply of energy resources to consumers, stimulating renewable energy sources and widespread introduction of energy-saving technologies, implementing a gradual transition to the market principles for pricing energy resources [1].

Thus, the increase in electricity tariffs will contribute to the rational energy consumption and use of energy-saving technologies by both individuals and legal entities of our republic. As a result, it is scheduled to achieve a reduction in the burden on the energy system, which, in turn, will result in the reduction in the burden on the environment and an improvement in the environmental situation as a whole.

To consider the advantages of using renewable energy sources, first we note the feature that renewable energy sources are hydropower (conversion of water flow through large natural and artificial water structures/dams, reservoirs into electricity), wind energy (generation of electricity from wind energy using wind turbines/fans), solar energy (solar panels that convert light into electricity), etc. Unlike fossil fuels such as oil, natural gas, coal and uranium ore, these energy sources do not run out, which is why they are called “renewable.”

Depending on the geographical location of a particular country, the possibilities of using renewable energy sources vary. Uzbekistan has very broad potential in this regard. Our country is distinguished not only by rare underground and above-ground resources, but also by unique features - sunny skies, windy expanses, fast rivers and biological sources.

In the Republic of Uzbekistan a lot of work is being done to switch to renewable energy. In particular, by 2026, the share of renewable energy sources should reach 25 percent.

In this regard there is the question: what does this mean and what will be the result?

This means saving 3 billion cubic meters of natural gas per year. This amount of gas can provide 1 million households for 1 year. Or from this amount of gas, an additional 15 billion kilowatt-hours of electricity can be produced. This is enough to provide electricity to 60 percent of the population of Uzbekistan for a year.

Currently, in Uzbekistan the contracts have been signed for the commissioning of 18 solar photovoltaic power plants with a total capacity of 6540 MW, 12 wind power plants with a capacity of 5200 MW, one hybrid power plant with a capacity of 600 MW, and 9 large projects for the commissioning of electricity storage systems with a total capacity of 1050 MW are being implemented. As a result of these efforts, the first large-scale solar photovoltaic power plant in Uzbekistan with a capacity of 100 megawatts was launched in Karmana district of Navoi region in August 2021. Furthermore, in May 2022 another solar photovoltaic power plant with a capacity of 100 megawatts was launched in Nurabad district of Samarkand region. In addition, the Republic of Karakalpakstan plans to build the largest wind power plant in Central Asia with a capacity of 1.5 gigawatts. This wind power plant is capable of producing 5.3 billion kWh of electricity per year providing electricity to 2 million 190 thousand households. In this way, 1.6 million cubic meters of natural gas reserves will be saved annually and 2.2 million tons of harmful gases will be prevented from entering the atmosphere.

Conclusion.

In general, the development of renewable energy sources is crucially important for the sustainable development of the country. Such energy sources are called “clean” because they do not harm the environment. They are also called “green energy”. This is a solid foundation for the healthy development of our future generations.

As useful and attractive as green energy may be, there is no doubt that it also requires high-tech solutions and huge investments. In addition, there is the issue of delivering electricity produced from alternative energy sources to the consumer without losses. And here again the issue comes down to updating, modernizing (reforming in accordance with modern requirements and quality indicators) the outdated infrastructure, and most importantly, to the earliest possible start of these works.

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Thus, “green” energy is not just a replacement for traditional energy sources, but a driver of transformation of the global economy, a tool for

mitigating global problems - energy, environmental, food, thereby being a factor in ensuring sustainable development.

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