



ALTERNATIVE ENERGY SOURCES

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Article history:	Abstract:
Received: 7 th April 2024 Accepted: 6 th May 2024	This article presents alternative energy sources and their pros and cons, as well as goals for the transition to renewable energy sources in countries around the world. In addition, a number of measures on the effective use of renewable energy sources in our republic have been highlighted.

Keywords: Alternative energy, hydropower, wind energy, solar energy, geothermal energy, biomass and tidal energy, Paris agreement, green deal project, hydroelectric plants, decarbonization

Alternative energy sources are renewable energy sources derived from hydropower, wind energy, solar energy, geothermal energy, biomass and tidal energy. 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. In 2019 alone, renewable energy facilities with a total capacity of 200 GW were installed worldwide.

Solar energy

The Sun is the main source of energy on Earth, as approximately 173 PW (or 173 million GW) of solar energy reaches our planet each year, which is 10,000 times more than global energy needs. Rooftop or outdoor photovoltaic modules convert sunlight into electricity using semiconductors - mainly silicon. Solar collectors generate heat for heating and hot water production, as well as for air conditioning.

Solar panels can generate energy in cloudy weather and even when it is snowing. For maximum efficiency, they must be installed at a certain angle - the farther from the equator, the greater the angle of installation of the panels.

The world's largest solar power plant is located in the Chinese desert - Tenger Solar Park or "Great Wall of the Sun". Its maximum power is 1547 MW, which is more than the power of a single average nuclear reactor.

The plus side of solar energy:

- Renewable and non-expirable. The sun shines everywhere and gives a lot of energy;
- Environmental cleanliness;
- Economical.

On the minus side:

- High initial installation cost;
- Solar panel recycling issues;
- Intermittent cycle and dependence on weather conditions.

Wind energy

Wind energy is one of the fastest growing renewable energy technologies. According to the latest IRENA data, global onshore and offshore wind power

generation capacity has grown nearly 75-fold over the past two decades, from 7.5 GW in 1997 to an estimated 564 GW by 2018.

The difficulty with working with the wind is that it is not constant - it does not always blow. However, many wind farms have been built around the world. The largest is located on the edge of the Gobi desert in China. Its capacity is almost 20 thousand MW.

The largest wind power plant in Russia - Kochubeevskaya wind farm is located in the Stavropol territory. Its capacity is 210 MW.

Advantages of wind energy:

- Wind energy is inexhaustible and environmentally friendly - there are no harmful emissions to the atmosphere;
- Requires a small area.

And the minuses:

- Inconsistency of performance because the wind flow cannot be adjusted;
- High installation cost;
- Noise, as a result of which large wind structures cannot always be installed near houses.

Geothermal energy

Geothermal energy uses heat from the Earth to generate electricity. The temperature of the soil makes it possible to heat the upper layers of the Earth and underground water reservoirs. Geothermal energy from the soil is obtained using small wells - it does not require large investments. This is especially effective in areas where hot springs are located close to the surface of the earth's crust.

However, in order to use underground energy, you must first obtain it. For this purpose, special geothermal power plants are built and wells are dug there. Through one of them, water under pressure from the ground, from the heat of the rocks, turns into steam, which comes to the surface through the second well. The resulting steam drives the generator and produces



electricity. The steam is condensed and sent underground again. It turns out to be a closed system. Geothermal energy is widely used in New Zealand, Iceland, France, Italy, Mexico, Lithuania, Indonesia, China and other countries. There are four geothermal power plants in Russia - three in Kamchatka Territory and one in Sakhalin.

Advantages of geothermal energy:

- Relatively low cost of construction and use;
- Work does not depend on climatic conditions, that is, the presence of sunlight or wind;
- Environmental cleanliness;
- Renewable and sustainable – unlike coal or oil, the energy inside the earth never runs out.

And the minuses:

- High consumption of fresh water;
- Geographical restrictions - enterprises are often built along tectonic cracks in the earth's crust;
- Seismic instability. Some believe that such enterprises can cause earthquakes;

The countries of the world have set ambitious goals for the transition to renewable energy sources. The targets are also part of the Paris Agreement - by 2030, carbon-free solutions can be competitive in sectors that account for more than 70% of global emissions. It is planned to do this through energy transition - the process of replacing the coal-based economy with renewable energy. In 2020, despite the pandemic and economic recession, many cities, countries and companies continued to announce or implement decarbonization plans.

China has become a leading producer of renewable energy equipment in ten years. First of all, we will talk about solar panels. Seven of the ten largest solar cell manufacturers in the world are Chinese companies. In general, the development of technology has reduced the cost of building new renewable energy facilities. This brings China's plans to become carbon neutral by 2060 closer.

The European Union has also forecast capacity growth in 2021. Here, even during the pandemic, they continued the Green Deal project. The goal of the project is to create a carbon-free space in the European Union by 2030. To achieve this, it is planned to reduce greenhouse gas emissions by 40% from the level of 1990 and to increase the share of energy from renewable sources in the total energy consumption to 32%.

Thus, in the first half of 2020, about 40% of electricity in the European Union was produced from renewable sources.

In recent years, large-scale work has been carried out to improve energy efficiency and expand the use of renewable energy sources in the economic and social sectors of our republic. In particular, the long-term development of the oil and gas, electric power, coal, chemical, construction industry aimed at ensuring stable economic growth in the Republic and increasing the level of well-being of the population, continuously satisfying the demand for fuel and energy resources strategy is being implemented.

At the same time, the existing capacities of the fuel and energy network do not fully meet the growing demand for energy resources, and the energy consumption of our country's economy is much higher than the average of developed countries.

Currently, only ten percent of the total amount of electricity produced in the country is contributed by renewable energy sources, which are mainly produced by hydroelectric plants. Finally, it is necessary to fully utilize the potential of renewable energy sources such as solar and wind, which have great potential.

Taking into account advanced foreign experience, increasing energy efficiency by attracting existing resources and untapped potential, wide introduction of energy-saving technologies and renewable energy sources, comprehensive organization of work on the drastic reduction of energy consumption in economic sectors and the social sphere, as well as , in order to ensure rational and efficient use of fuel and energy resources, the Law "On the use of renewable energy sources" provides a number of privileges and preferences, including the following:

- From the date of state registration of producers of renewable energy sources from paying all types of taxes for a period of five years;
- To pay property tax and land tax on the plots occupied by these devices for the period of ten years from the moment they were commissioned for the installation of renewable energy sources devices;
- Persons who use renewable energy sources in residential areas completely disconnected from existing energy resources networks are exempted from paying land tax for a period of three years from the month of use of renewable energy sources.

Besides,

- Encouraging the use of energy using equipment that generates energy from



renewable sources by expanding the introduction of energy-saving technologies, giving tax and customs benefits;

- Rational use of non-renewable hydrocarbon resources, increasing the competitiveness of manufactured products, and on this basis, providing stable fuel and energy resources to economic sectors and the population;
- Transfer of efficient technologies in terms of renewable energy sources and energy consumption, production of equipment and components in this field at local enterprises;
- Ensuring the availability of guaranteed energy resources for the population, especially in remote rural areas, improving the quality of life of the population and increasing their well-being.

The sources of electricity production of the country are natural gas and oil products. Taking into account the importance of renewable energy sources in saving hydrocarbon resources, ensuring the energy security of our country, as well as providing electricity, heat and drinking water to people living in settlements far from the central electricity supply, in mountains and steppes, regions, as well as , seasonal workers and expedition members in the republic are paying more attention to the development of this direction.

To sum up, in the near future, reducing the energy and resource capacity of the economy, widely introducing energy-saving technologies, expanding the use of renewable energy sources, and increasing labor efficiency are considered as priority tasks.

The implementation of comprehensive measures on the rapid use of renewable energy sources is aimed at ensuring the production of industrial types of energy, such as heat and electricity, which replace hydrocarbons and convert them into highly liquid products, including polymers, fuels. allows to direct the production of synthetic types.

REFERENCES:

1. N.T.Toshpo'latov, D.B. Qodirov. "Qayta tiklanuvchi energiya manbalari" (O'quv qo'llanma). Toshkent-2020.
2. HASHIMOVA S. N. GUARANTEED GREEN ECONOMY AND DEVELOPMENT //ЭКОНОМИКА. – С. 61-64.
3. Xashimova S. N., Abdikarimova A. A. BARQAROR RIVOJLANISHNI TA'MINLASHDA YASHIL IQTISODIYOT VA RAQAMLASHTIRISH //IQRO. – 2023. – T. 3. – №. 2. – С. 23-26.
4. S.Q. Qahhorov, H.O. Jo'rayev, Y.Y. Jamilov, N.M. Hamdamova. "Qayta tiklanuvchi energiya manbalari" (O'quv qo'llanma). Vuxoro-2021.
5. Хашимова С.Н. Яшил иктисодиет тараккиет гарови. /Бизнес-эксперт. №3, 2022.
6. Хашимова С. Н. ПАНДЕМИЯ ШАРОИТИДА РАҚАМЛИ ИҚТИСОДИЁТНИ РИВОЖЛАНТИРИШ //Экономика и финансы (Узбекистан). – 2022. – №. 3 (151). – С. 77-80.