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**INDUSTRIAL RECYCLING IN THE REPUBLIC OF UZBEKISTAN
EFFICIENCY OF RENEWABLE ENERGY SOURCES AND ACCESS
OPTIONS**

Eshmatov Mansur Musulnomovich,

Barotov Qobuljon Nizomjon o'g'li

Samarkand State Architectural and Construction Mirzo Ulugbek Institute

Abstract: This article discusses the secondary type of energy consumed during human daily needs and the new energy sources that can be obtained through its use.

Key words: wind and solar energy, bioenergy, renewable energy sources, hydroelectric power plants, solar panels.

Energy resources are divided into two.

1. Renewable
2. Non-renewable (oil, gas, shale, coal, peat, etc.)

Thermal energy resources include non-renewable resources such as oil, gas, coal and firewood.

There are 2 different types of energy.

1. Conventional (non-renewable energy)
2. Non-conventional (renewable energy) is a type of environmentally friendly energy.

Using thermal energy resources, thermal power plants generate electricity and require a separate thermal power plant.

For non-traditional ones, ES (Power Plant) is not required. You can also install an object to support a specific object. This is only for solar and wind energy.

When an object (solid, liquid, or gaseous) moves again by transferring its energy to a device that converts it into another type, and does not disappear by itself, it is called a

renewable energy source (wind, solar). , rising and falling water levels, waves, small- and mini- and microHPPs, geothermal, space, biofuels, hydrogen and quantum).

Non-conventional energy sources (wind, solar, water levels) 'shrinkage, waves, small- and mini- and microHPPs, geothermal, space, biofuels, hydrogen and quantum).

Wind energy is the process of taking mechanical energy from the wind and then converting it into electrical energy. There are vertical and horizontal rotary shaft wind turbines. Wind energy can be used successfully when the wind speed is 5 m / s or more. The downside is the big noise.

The potential of wind energy in the world is huge. Theoretically, this energy could meet all the demands of Europe. Recent engineering successes in the construction of low-speed wind generators show that the use of wind is economically justified. But restrictions on the construction of SHES, especially the population in densely populated areas, this reduces the potential of the energy source.

Wind energy prices are declining by 15% per year and are even more competitive in the market today, with the potential to decline in the future, in contrast to energy prices, which are mainly derived from nuclear power plants (increasing by 5% per year); at the same time, the growth rate of wind energy is more than 25% per year. The use of wind energy is increasing in different countries. The development of wind energy in developed countries shows that wind turbines with a capacity of more than 100 kW, especially in the range of 200-500 kW, are the most optimal. In Denmark, for example, 1 kWh of electricity generated at a wind farm is cheaper than at a thermal power plant.



Solar energy. There are several technologies of solar energy. Collected from a large number of series and parallel connected elements, photovoltaic generators that directly convert the radiant energy of the Sun are called solar cells.

Obtaining energy from sunlight does not emit harmful emissions into the atmosphere, and the production of standard silicone solar cells is also less harmful. However, the large-scale use of multi-layered elements from unusual materials such as gallium arsenide or cadmium sulfide is associated with harmful emissions.

Solar panels take up a lot of space. But compared to other sources, such as coal, they are completely appropriate. In addition, solar panels can be placed on the roofs of houses, along highways, and can be used in solar-rich deserts.

The features of solar panels allow them to be placed over long distances, while modular structures can be easily carried and placed elsewhere. Therefore, solar panels used in rural and remote areas provide much cheaper electricity.

People in remote areas use solar energy for lighting, radio broadcasting and other household needs, and solar energy is practically used to lift water from wells and for health needs.

The main reason that stops the widespread use of solar energy is its high cost. This will decrease in the future as a result of the development of cheap and efficient technologies. The current price of solar electricity is \$ 4.5 per 1 watt, and the price of 1.0 kWh of electricity is six times higher than that of conventional fossil fuels. When

the price of solar energy is equal to the price of fossil fuels, it can spread, but since the 1990s, the rate of development of solar energy has been 6% per year, while world oil consumption is 1.5% per year.

Solar energy can be used to generate heat, especially for residential heating.

Bioenergy is energy based on the use of biofuels. These include plant waste, artificial biomass (aquatic plants, fast-growing trees) and biogas production. Biogas is a mixture of combustible gases formed during the biological decomposition of biomass or organic household waste (technical composition: - 55-65% methane, 35-45% - a mixture of carbon dioxide, nitrogen, hydrogen and hydrogen sulfide). The method of obtaining biogas in industry was known in 1885 before the last century. There are more than 8 million biogas plants in the world.

Biomass- is the cheapest and largest form of renewable energy. The term "biomass" refers to nutrients and organic wastes of any biological origin. Biomass, the annual increase in organic matter in the earth, which is always present as long as there is life on earth, is equivalent to the amount of energy that at the present stage is 10 times more than the energy consumed by all mankind in a year.

Sources of biomass for our country can be divided into three main groups:

- natural growth nutrients (wood, wood waste, leaves, etc.);
- taking into account human waste and production activities (solid waste, industrial waste, etc.);
- Specially grown high-yielding plants.

Hydropower.Hydroelectric power stations (HPP) - a complex of hydraulic structures and power equipment, through which the energy of water flow is converted into electricity. As a result of the construction of hydropower plants, the environment will be damaged: the flow of rivers will change their course, a large area will be flooded, and flora and fauna will be severely damaged. One of the main features of water flow energy compared to thermal energy is its reproducibility.

Another type of HPP is a hydroaccumulation HPP, where pumps and turbines are used interlocking. The upper reaches of such hydropower plants can be a reservoir or a river.

The energy of the waves. There are two types of wave energy: wave energy and rising and falling energy. Using the energy of waves in the oceans and seas.

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