

HELIOTECHNICS AND THE IMPORTANCE OF USING SOLAR ENERGY

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Annotation

In this paper, the direction of use of solar energy is heat generation and no complex and expensive converter devices are required by using this source using potential energy. There is information about the work being done in the field of solar equipment and solar technology.

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Heliotechnics (from helio and technology), a branch of technology that studies the conversion of solar radiation energy into other types of energy that are convenient for practical use.

In Uzbekistan, much attention is paid to expanding the use of non-traditional energy sources, primarily solar energy. The latest developments of Uzbek scientists are also used in agriculture. As you know, there are difficulties in water supply in regions where there are no or for some reason there are no power lines and water supply systems. For this purpose, a photovoltaic installation is used that converts solar energy into electrical energy. It includes solar panels, an energy storage system and a DC/AC converter. Farms can use the irrigation system using resource-saving technologies - drip irrigation and develop previously non-irrigated lands. Scientists have also developed solar water desalination plants, photovoltaic stations and photovoltaic street lighting systems, as well as other technological innovations. The potential of solar energy in Uzbekistan, according to experts from the Asian Development Bank, is about 51 billion tons of oil equivalent. The number of sunny days in a year exceeds 300, the number of sunny hours in the south reaches 3000. It should be noted that the state is taking concrete steps to develop solar energy - for example, the country's first solar power plant with a capacity of 100 MW is being built near Samarkand. Once launched, this station will provide electricity to several districts. By 2020, it is planned to build 3 solar power plants with a capacity of 100 MW each in Uzbekistan. These are major stations. Medium stations are also being built; in 2015, a test solar photovoltaic station (SFES) with a capacity of 130 kW was put into operation in Namangan region. Such a station will produce 500-600 kWh of energy per day. The project was implemented by JSC "Uzbekenergo" together with Korean partners. In April 2016, a mobile solar power plant with a capacity of 1.2 MW (1200 kW) was launched in the Bukhara region to supply the facilities of the Russian company Lukoil. The use of solar energy in agriculture has become easier and more affordable due to the rapid development of technology and increased awareness of renewable energy sources. Although it is difficult for many farms to use only solar energy, natural methods of using solar energy and installed solar panels are the main methods that can be adopted by almost

all farm owners. The use of solar energy in agriculture has become easier and more affordable due to the rapid development of technology and increased awareness of renewable energy sources. The simplest design of a solar dryer is a low-temperature hot-box solar plant. It consists of a wooden or concrete frame with a well-insulated bottom, topped with one or more layers of hermetically sealed window glass or film. In the end walls of the box there are holes with a valve for supplying and regulating the air velocity. Solar dryers are installed at an angle to the horizon and the surface is directed to the south. The air entering the unit is heated and exits through the upper openings.

The wide practical use of solar energy is hampered by its relatively low density and variability of income. Because of this, it is necessary to use large surfaces that capture the radiation of the Sun, or install helioconcentrators, with the help of which the flux density is increased and a high temperature is obtained on the receiving surface of the converter. The volatility of solar energy forces one to resort to energy storage (thermal, electrical, chemical and other batteries) and finished products (for example, when desalination of mineralized water, when water is raised from wells, etc.) or to use consumption schemes with a free energy consumption schedule (for example, in irrigation and melioration).

Today, technologies for creating solar trackers and their use to improve the efficiency of solar power plants are being widely studied. Currently, there are solar trackers with one and two axes of rotation. Mathematical models are being developed to provide optimal location of solar panels and other energy conversion systems relative to the solar coordinate and their high efficiency at small and large power plants using trackers. The technical, ecological, economic and scientific-practical problems of their use in the industrial sector are investigated. The use of solar trackers designed to work with large-scale systems is especially inconvenient due to natural phenomena. For example, due to the lack of direct directional light in cloudy conditions, the efficiency of concentrators installed on trackers is sharply reduced. One of the optimal solutions for determining solar coordinates under such conditions is given by J. Antonanzas and others. And the tracker proposed by Elsherbin was implemented on the basis of Arduino UNO controllers, and its resistance to strong winds was achieved using wind sensors. In addition, practical and economic issues of the effective use of existing trackers in various regions are widely studied. The analysis shows that while solar trackers allow solar cell surface normals to be adjusted at an optimal angle with respect to incident sunlight, and in turn allow their full potential to be exploited (relatively), especially when used with concentrators or in hot climates, system temperature increases sharply, and the overall efficiency of the system does not give the expected results.

From the scientific results we can see that significant results have been achieved. You can see them by reading the following cases. It is clear that the developed smart devices, systems based on innovative approaches will pay off. Accuracy and quality in the system allow you to manage projects and processes created in general. Interest and use of non-traditional and renewable energy sources in our country is becoming more and more popular. Foreign and international banks are investing in the construction and operation of non-traditional and renewable energy sources.

Currently, many studies on the use of solar energy are being successfully completed. Modern achievements in chemistry and physics, the use of cheap materials with high technical characteristics (structural plastics, transparent and aluminized synthetic films, selective coatings of receiving surfaces, etc.) contribute to increasing the productivity of solar installations and reducing their cost, which significantly expands the boundaries of the practical use of solar energy.

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