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SOLAR PANELS: RENEWABLE ENERGY SOURCES AND ENERGY SAVING TECHNOLOGIES

Abstract. The article contains the history of solar energy harvesting, answers to questions about the effects of solar panels on human health and the environment, and information on the work being carried out by the government of Uzbekistan in this regard.

Key words. green energy, solar panels, electricity, solar battery.

Introduction. Today, the whole world, including Uzbekistan, is paying great attention to "Green energy". The government offers a number of incentives for business owners and residents to use solar panels. The reason is that Uzbekistan is a beautiful country where the sun shines almost every day of the year. This provides a great natural opportunity for the alternative we are talking about, including solar energy.

Literature review. Before talking about solar panels, it would be appropriate to take a look at the history of solar energy production.

The effect of converting light into electricity was discovered in 1839 by the French physicist Alexandre Edmond Becquerel. Later, scientists began using selenium to convert light into electricity. The first prototypes of solar panels were founded by the Italian photo-chemist Giacomo Luigi Chamichan in 1912. In 1954, Bell Laboratories announced the creation of the first silicon-based solar panel. But the efficiency of this solar cell was only 6 percent.

Today, a grid-connected solar panel system can provide a home with full power for just a few hours on average. Even if the power goes out, the batteries will continue to work.

So what are solar cells? What are its advantages? A solar cell is a power source based on semiconductor photocells, which directly converts solar radiation energy into electrical energy. The operation of solar cells is based on the internal photoeffect phenomenon. The first solar cell was developed in 1953-54 by US scientists G. Pearson, K. Fuller and D. Chapin. According to experts, the cheapest solar panels have a power of 150 W, which can be used to light 5-6 rooms and operate one TV. If you need to power two TVs, one refrigerator, and more rooms, you need at least 2 kW of solar panels. Using solar panels, you can not only have stable, but also free electricity, and you can generate it yourself.

As the popularity of solar power plants increases, many questions arise about the impact of these devices on human health and the environment. Are solar panels safe for human health and the environment? We will try to find answers to such questions below.

Solar panels are good for health. There are no studies confirming that such devices pose a risk to human or animal health or their negative impact on the environment. Currently, silicon (silicon-based thin-film batteries), cadmium telluride, and gallium-based concentrator batteries are used for the production of solar panels. If the safety rules are followed during the preparation and disposal of panels, in this case there will be no harm to people and the atmosphere.

Many people may wonder if installing solar panels on the roof of a building increases the risk of fire. According to scientists, the concept that solar panels "attract" lightning is wrong. During a lightning strike, a building equipped with solar modules is exposed to the same amount of electricity as a building without panels. Again, the above statement: if the safety of the equipment is observed during the installation of solar panels, no problems will be observed.

One of the most common concerns about solar panels is their negative impact on the environment. Solar farms and ecology are not enemies. On the contrary, during the use of solar panels, the "carbon footprint" in the atmosphere

is less. A solar panel produces only 50 g of carbon dioxide during the production of 1 kWh of energy. For comparison, when coal is used to get the same amount of energy, 1000 g of carbon dioxide is released!

Disposal of expired solar panels is also environmentally friendly. In this process, it is enough to follow strict requirements for disassembly, storage and processing of photoelectric modules.

As we have seen above, there is no reason to worry that the growing number of solar farms could be harmful. Solar panels guarantee a high level of safety if high-quality raw materials are used in the production process, as well as if the specified requirements are observed during installation, use and disposal.

Result and discussion. In fact, today it is impossible to imagine life without electricity. Developed countries have already met their daily needs through solar panels. In Uzbekistan, systematic work is being carried out to increase the efficiency of electricity and use of solar panels.

In order to introduce mechanisms of state support for the widespread use of renewable energy sources by the population and business entities, to provide electricity and thermal energy through these sources, and to encourage the effective use of energy resources in administrative and household buildings and structures:

The directions of state support for the wide use of renewable energy sources have been determined.

1. Financial incentives for the purchase of renewable energy source devices by residents and business entities;

2. Implementation of targeted measures on the use of alternative energy sources in administrative and household buildings and structures, including residential areas and apartments;

3. Wider attraction of private investments in the field by increasing the attractiveness of business projects related to the construction of micro and small hydropower plants;

3. All-round support for business entities that manufacture devices for solar and wind power plants and small hydropower plants.[1]

A system of subsidizing electricity produced by solar panels has been developed. The Presidential Decree "On measures to accelerate the introduction of renewable energy sources and energy-saving technologies in 2023" (PQ-57, 16.02.2023) was adopted. According to the decision, in 2023, proposals were made to launch renewable energy sources with a total capacity of 4,300 MW. Including:

- ✓ 2 100 MW - large solar and wind power plants;
- ✓ 1,200 MW - solar panels installed in social facilities, buildings and structures of economic entities, and apartments;
- ✓ 550 MW - small photoelectric plants built by entrepreneurs.

Also in 2023:

- ➢ 27 large capacity solar and wind power plants will be built on the basis of public-private partnership;
- ➢ 20,000 social sector facilities and state offices will install small capacity renewable energy sources devices;
- ➢ solar panels will be installed in the buildings and facilities of 11,000 entrepreneurs and small photoelectric plants will be built;
- ➢ Small capacity renewable energy sources devices will be installed in 37,000 households;
- ➢ 765 apartment buildings to be commissioned will be supplied with renewable energy sources;
- ➢ 103 small and micro hydropower plants will be built in the regions;
- ➢ 5,407 social sector facilities are heated with coal.
- ➢ From April 1, 2023, the "Sunny house" program will be implemented to encourage the installation of small power (total capacity up to 50 kW) solar panels in the territories of the republic.

Produced by residents through solar panels within the program. A subsidy of 1,000 soums is provided for each kilowatt-hour of excess electricity.

According to the decision, the limited liability company "Green Energy" was established for the installation and operation of small power renewable energy sources in the buildings and structures of social sphere objects, state bodies and other organizations[2].

Conclusion. Solar panels: By using renewable energy sources and energy-saving technologies, we can all create a completely sustainable future for energy supply without harming the world we live in.

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