

PROVIDING OPTIMUM OPERATION MODES OF SMALL PHOTOELECTRIC PLANTS FOR AUTONOMOUS ELECTRICITY CONSUMERS

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Abstract: This article presents a number of considerations on improving the efficiency of solar panels used as an alternative energy source for autonomous electricity consumers, in homes, by ensuring the optimal operating mode.

Key words: electric consumers, energy-saving technology, green energy, solar panels, energy efficiency improvement.

1 6.02.2023 of the President of the Republic of Uzbekistan No. PQ-57 of the year Decision **on measures to accelerate the introduction of renewable energy sources and energy-saving technologies in 2023** (<https://lex.uz/uz/docs/-638571>) in paragraph 15:

Starting from April 1, 2023, the "Sunny house" program (hereinafter - the Program) to encourage the installation of small power (total capacity up to 50 kW) solar panels in the territories of the republic should be implemented.

In 2023, the plan to install small capacity renewable energy sources in 37,000 households should be approved in accordance with Appendix 4 .

Within the program:

a) a subsidy of 1,000 soums is allocated from the State budget for each kilowatt-hour of electricity produced by solar panels installed in objects belonging to individuals and transferred to the unified electric power system in excess of its own consumption (hereinafter referred to as subsidy) . In this:

the subsidy is calculated based on the amount of positive difference between the amount of energy transferred by individuals to the single electric energy system and the amount of electricity consumed from the system by the end of each month;

subsidy ransom demands physical of individuals total income to the composition not included;

subsidy tax organs by each " Tax " mobile per month app through report from month next until the 25th of the month citizens bank plastic cards through _ is given ;

b) physical persons by the only one electricity energy to the system transmitted electricity energy size :

during the month the only one electricity energy from the system consumption done electricity energy from the volume many p has been in the case of this month electricity energy according to " Territorial electricity networks " to JJ payment not done;

during the month the only one electricity energy from the system consumption done electricity energy from the volume less was _ in the case of this month electricity energy according to payments consumption done and transmitted electricity energy from the difference come out is _

c) " Territorial electricity networks " by AJ for free received electricity energy income as account not taken .

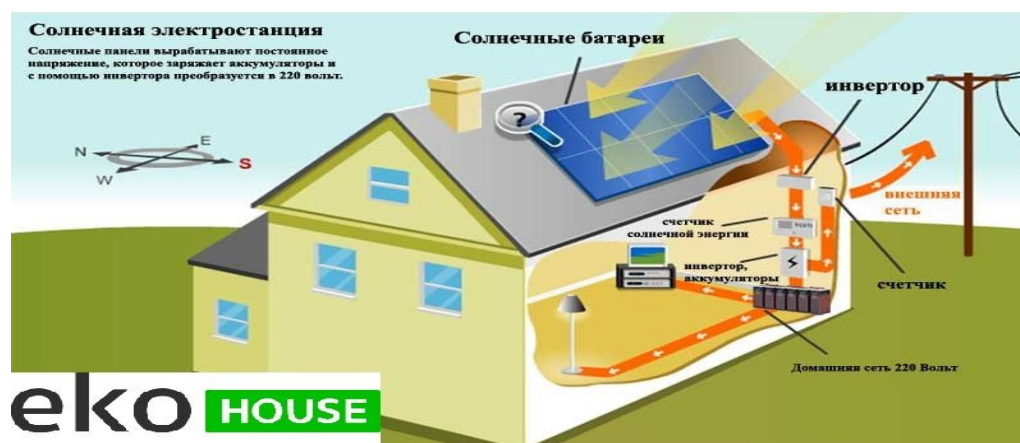


Figure 1. The sun electricity station the apartment for

Currently, solar panels are being installed on the roofs of residents' houses in order to use alternative energy sources. The solar panel is installed at an angle of 45 degrees to the roof.



Figure 2. Technology of using solar energy

This panel works in the nominal operating mode in the range of 23-35 degrees and produces electricity. In the territory of Uzbekistan, the climate in the summer season is 40-45 degrees. This affects the energy efficiency of the solar panel. If the efficiency of the solar panel exceeds 35 degrees, the efficiency of electricity production will partially decrease. In this case, to increase the efficiency of the solar panel, it is necessary to keep the temperature of the solar panel at the same temperature. Then the energy efficiency of the solar panel will partially increase. To overcome this problem, the following processes are implemented.

1. Solar panel surface cooling system.

To moderate the temperature of the surface of the solar panel, drive the water with a temperature of 25 degrees to the surface of the solar panel and check the temperature of the water and the temperature of the solar panel according to the second law of thermodynamics, that is, the law of heat exchange.

2. 25 degree temperature water transfer system for solar panel surface.

Transfer liquid to the surface of the solar panel using the solar panel, thermocouple, pump unit, water filtration system, pipes, etc.

OK. How does this system work? The pump unit is installed at a depth of 2 meters from the ground to drive water with a temperature of 25 degrees. Then thermocouples are placed on the solar panel. The function of the thermosensor is to start the pump unit when the solar panel exceeds the specified nominal temperature. Pipes connected to the pump unit are used to transfer liquid through the pump unit. Water filtration system - used for cooling the surface of solar panels and processing of collected water. So, we have considered all the system dependent processes and we can consider the sequence of system operation. In the summer season, the temperature of the sun is 35-40 degrees, the temperature of the solar panel is 5-10 degrees, as a result, the temperature set on the solar panel is 45-50 degrees. We set the temperature of the thermometer placed on the solar panel as 45 degrees. When the temperature of the solar panel exceeds 45 degrees, the thermometer is activated and through the pump unit, the water of 25 degrees is driven to the surface of the solar panel, and according to the above law, the temperature of the surface of the solar panel decreases. By driving water on the surface of the solar panel, we achieve the following results.

1. Achieving energy efficiency by keeping the temperature of the solar panel moderate.

2. Providing technical service to the surface of the solar panel (the surface of the solar panel is washed with water).

3. Extending the duration of solar panel operation.

Water falling from the surface of the solar panel is transferred to the filtration system through pipes. The filtered water is poured into the 2nd tank and stored until its temperature drops to 25 degrees. When the temperature reaches 25 degrees, the thermosensor opens the valve and directs it to the 1st tank and pours it.

We can conclude from this that using the above system, we can optimize the operation mode of the solar panel and achieve a number of advantages.

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