



CONDITIONS OF INSTALLATION OF SOLAR PANELS IN ANDIJAN CITY AREA

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Abstract: Currently, the demand for electricity is increasing year by year. Therefore, the production of electricity must also increase. The most alternative option for this is the example of solar panels. Nowadays, solar panels are being installed in various regions of Uzbekistan. we can see that the installation work is being carried out. In this, we can see how much benefit the solar panel brings to the electricity.

Key words: Solar panels, installation conditions, inverters, sun, light, area, installation.

The use of solar energy as a renewable energy source cannot be denied. The reason for this is the unlimited source of energy that can be obtained from the sun and converted into electricity through solar panels. First of all, we need to know how to install solar panels.

The installation allows the panels to be adjusted to the optimal tilt based on latitude, season and even time of day to ensure maximum solar energy production. The most common places for installation are on the roof, using solar roof devices or with ground mounting options.



Fig1. Stanford University scientists have created unusual solar panels. They generate energy even at night. Most of the solar energy that hits the earth during the day is returned to space as radiation at night.



During this phenomenon, objects on the Earth's surface become cooler than the surrounding air. Studies have shown better results on cloudless nights. 50 MW of energy was produced from each square meter of the solar cell.

During the day, a square meter of solar panel produces about 150 watts of electricity.

First of all, we need to know what a solar cell is and how it works. These solar panels consist of photovoltaic cells made of different semiconductor materials. These materials allow us to convert energy from the sun into electricity for use in our homes.

Power inverter is responsible for converting the energy generated by the solar cells to activate it, so that the alternating current is useful for domestic use.



A solar panel is a device that converts solar radiation energy into electrical energy either directly or through the photoelectric or photochemical effect of absorbing sunlight. The main component of most solar panels is silicon, but the production cost is relatively low.

- Tempered glass is used to protect the power generation body and should be selected with high conductivity. Light transmittance should be high. (usually 91% or higher)
- EVA is used to glue and fix temperature glass and power generation body. The quality of transparent EVA material directly affects the life of the module. EVA exposed to air is prone to degradation over time.
- The main function of solar panel cells is to generate electricity, and the mainstream of the main power generation market is crystalline, silicon solar cells and thin film solar cells, both of which have their advantages and disadvantages. Crystalline silicon solar cells have relatively low equipment costs, but high consumption and battery costs, as well as high photoelectric conversion efficiency.
- EVA it mainly glues and packages the main part of the power generation and the back panel.



- Backplane function must be sealed, insulation and other waterproof materials resist aging. Most component manufacturers offer a 25-year warranty.
- Aluminum alloy protective laminate acts as a certain seal and support.
- The junction box protects the entire power generation system and acts as a power transfer station.
- The function of silicone sealant is used to seal the joint between the component and the aluminum alloy frame and the joint between the junction box

Installation of solar panels in the conditions of Uzbekistan: "Sunny house" program for installing small solar panels in houses is starting in Uzbekistan. It is planned to install panels in 37,000 households in 2023. A subsidy of 1,000 soums will be allocated for each kWh transferred to the unified electricity system.



From April 1, implementation of the "Sunny House" program will begin in Uzbekistan to encourage the installation of small-capacity solar panels (up to 50 kW) in households in the regions. This is provided for in the decision of President Shavkat Mirziyoyev dated February 16 "On measures to accelerate the introduction of renewable energy sources and energy-saving technologies in 2023".

The installation allows the panels to be adjusted to the optimal tilt based on latitude, season and even time of day to ensure maximum solar energy production. The most common places for installation are on the roof, using solar roof devices or with ground mounting options.

Mounting systems are metal racks that hold solar panels to the roof or ground.

The most common way to mount modules is to use a solar panel mounting bracket. Mounting brackets are heavy duty hardware and are usually made of stainless steel or aluminum. All solar panels and fixtures, whether rooftop or ground, must meet strict guidelines to withstand severe wind and weather events and ensure structural integrity.

According to the approved plan, in 2023, it is planned to install low-power renewable energy sources in 37,000 households. As part of the program, a subsidy



of 1,000 soums will be allocated for each kilowatt-hour of excess electricity produced by the population through solar panels.

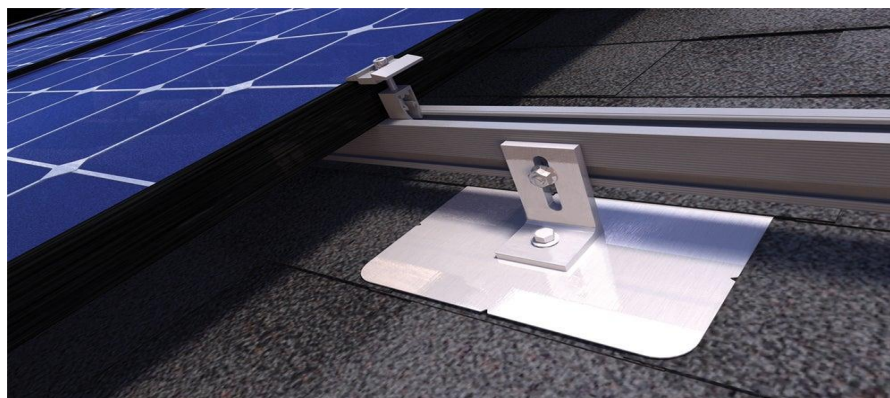
In Uzbekistan, the "Sunny House" program to install small solar panels on houses will be launched. It is planned to install panels in 37,000 households in 2023. A subsidy of 1,000 soums will be allocated for each kWh transferred to the unified electricity system.

In case of less than the amount of electricity consumed from the single electric power system during the month, payments for electricity for this month are calculated based on the difference between consumed and transmitted electricity.

The presidential decision "On measures to accelerate the introduction of renewable energy sources and energy-saving technologies in 2023" was adopted.

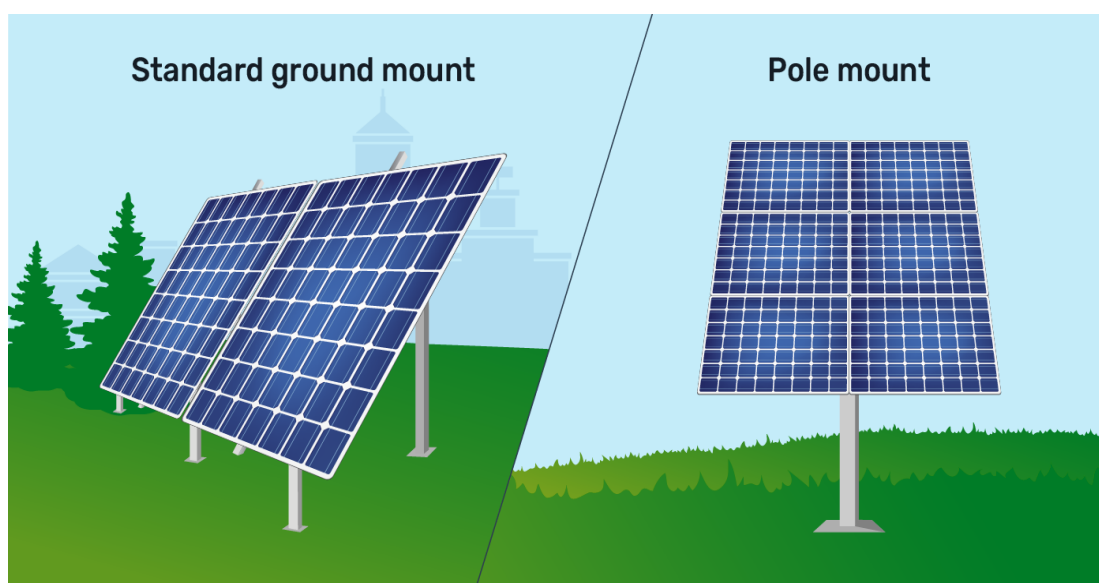
According to it, renewable energy sources with a total capacity of 4,300 MW will be launched in 2023. In particular:

- 2,100 MW — large solar and wind power plants;
- 1,200 MW - solar panels installed in the social sector, farm buildings and structures, and apartments;
- 550 MW - small photoelectric plants built by entrepreneurs.
- In addition, solar panels will be installed in the buildings and facilities of 11,000 entrepreneurs, and small photoelectric plants will be built.
- 765 high-rise buildings will be supplied with renewable energy sources by installing small-capacity renewable energy sources devices in 37,000 households.
- 103 small and micro hydropower plants will be built in the regions and 5,407 social facilities will be heated with coal.
- From April 1, 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.
- It is also planned to launch 7 power plants with a total capacity of 2910.6 MW in Uzbekistan. In Sirdarya, Navoi, Surkhandarya, Samarkand and Jizzakh, 1 thermal power plant, 1 wind, 3 solar and 2 hydroelectric power plants will be put into operation and connected to a single electricity grid.





They are built to be durable, flexible and weather resistant. They also come with a 25-year warranty. A ground-mounted solar energy system is just what it sounds like - a system of solar panels installed on your property, not on the roof of your home. Ground-mounted solar panels are your outdoor space and can be installed anywhere with good sunlight. The panels can be installed anywhere from a few inches to several feet high. The panels power a solar inverter, which is located behind the panels or on the house. Residential solar systems are typically built using 60-cell solar panels—typically used on rooftop solar systems on solar panels. However, large-scale ground-mounted systems use 72-cell solar panels, as in solar installations. Ground-mounted solar panels also include backyard solar panels, stand-alone solar panels, and ground-mounted PV. also known as systems



You can use a standard ground mount that holds the panels together, or a pole mount that places the panels higher off the ground.

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