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PHOTOVOLTAIC STATION "HALF-PYRAMID" WITH DOUBLE-SIDED SOLAR PANELS

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Solar energy today has the greatest chance of becoming fundamental among the varieties of alternative energy sources against the background of the growth of its share in the world energy balance. This is due to the fact that the source of solar energy is radiation, namely thermonuclear reactions on the Sun, which are inexhaustible. Also, important factors in the rapid development of solar energy are high environmental friendliness and low cost of electricity production.

The general process of generating electrical energy at a solar power plant is shown in Fig. 1.

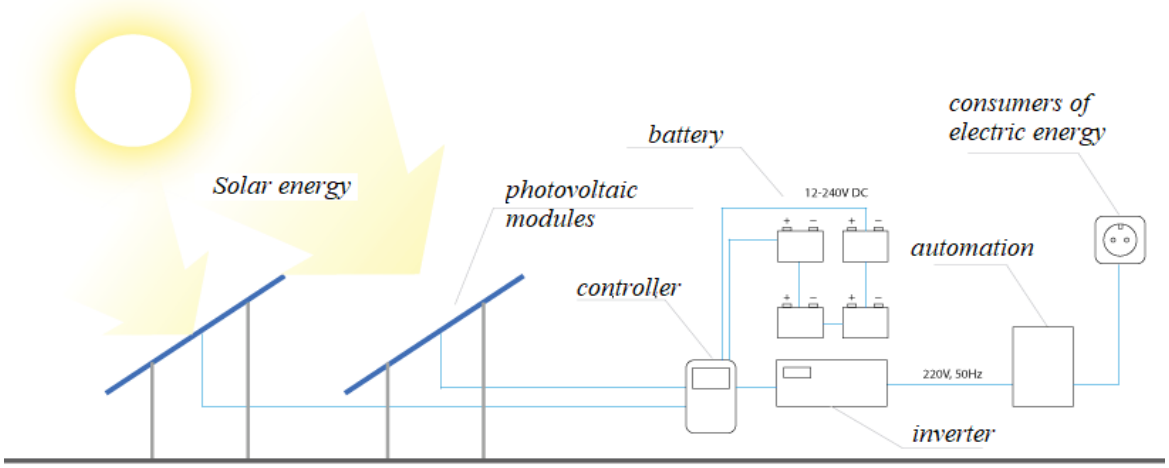

Fig. 1. **The process of generating electricity at a solar power plant**

The energy efficiency of a photovoltaic power plant is a multi-criteria task, but undoubtedly depends on the design features of the equipment and the climatic conditions in which it is installed and operated [1].

Solar panels are the main element that performs the function of converting solar energy into electrical energy, and it is their design, technical indicators, and installation method that have the greatest impact on the energy efficiency of a solar power plant [2,3].

The authors developed the design of the “Half-Pyramid” photovoltaic station, which is easy to implement and has higher energy efficiency compared to its analogues. The “Half-Pyramid” photovoltaic station is shown in Fig. 2.

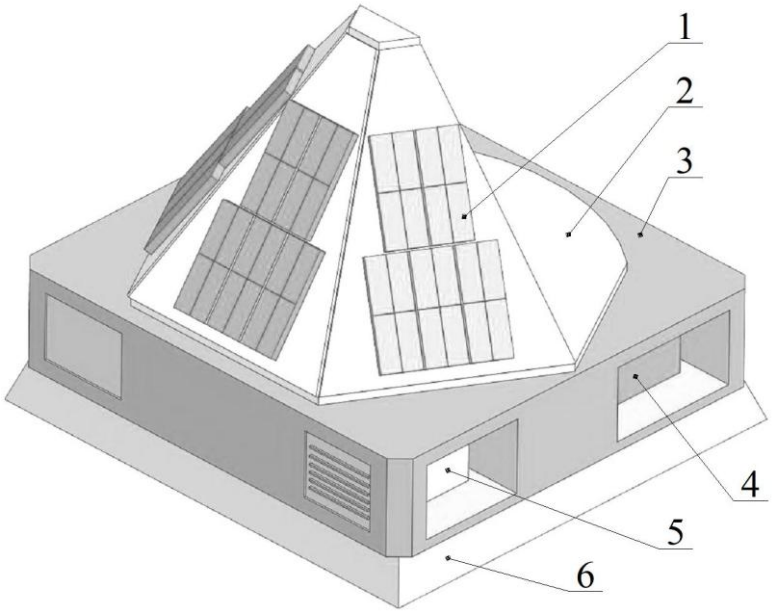

Fig. 2. **Construction of the photovoltaic station "Half-pyramid"**

The solar power system shown in Fig. 2 consists of a supporting structure in the form of a half-pyramid, on the sides of which two-sided solar panels 1 are attached. Inside the half-pyramid, the base is made of a mirror material 2 to reflect solar radiation onto the inner side of the panels. The half pyramid structure with photomodules is installed on a box 3, in which an inverter 5 and battery system 4 are located. The entire structure is installed on a trapezoidal foundation-frame 6.

The presented photovoltaic station has a number of advantages, namely:

- compactness of the installation, all equipment is in one case.
- the ability to adjust the angle of the panels using simple mechanical devices, which reduces the cost of installation by eliminating expensive trackers.

- increasing the energy efficiency of the photovoltaic station due to the use of double-sided panels, which leads to an increase in electricity generation by 15-20%.
- resistance of the structure to wind loads and overturning.
- ease of assembly, installation and operation.

Conclusions and suggestions. Based on the presented material, it can be concluded that the proposed design of the photovoltaic station "Half-pyramid" is an energy-efficient and economically justified solution, which is relevant today and opens up prospects for widespread use in the implementation of autonomous power supply systems of alternative energy. It should also be noted that the developed design is a source of environmentally friendly electricity and does not have a detrimental effect on the environment.

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