

IMPROVING THE EFFICIENCY OF SOLAR PANELS

Sh.N.Khudoberdiyev

PHONE:

E-MAIL: Wavkatjonfergana@gmail.com

Kokand branch of Tashkent State Technical University named after Islam Karimov

ABSTRACT: Alternative energy sources are actively occupying the consumer market. Ten years ago, most people never imagined the possibility of having engineering developments like a wind farm or a solar power plant. Now it will be possible. Solar panels for the home: the cost of the kit, installation and maintenance costs are today's economic solution. It is known that the effectiveness of solar panels depends on the angle at which sunlight hits its surface. Therefore, the average daily efficiency of solar panels of the same sample placed on a static base and a solar tracker is different. This thesis compares the efficiency of solar cells in a sample installed in two ways.

Keywords: Solar cell, solar tracker, optimal angle, energy dissipation, efficiency.

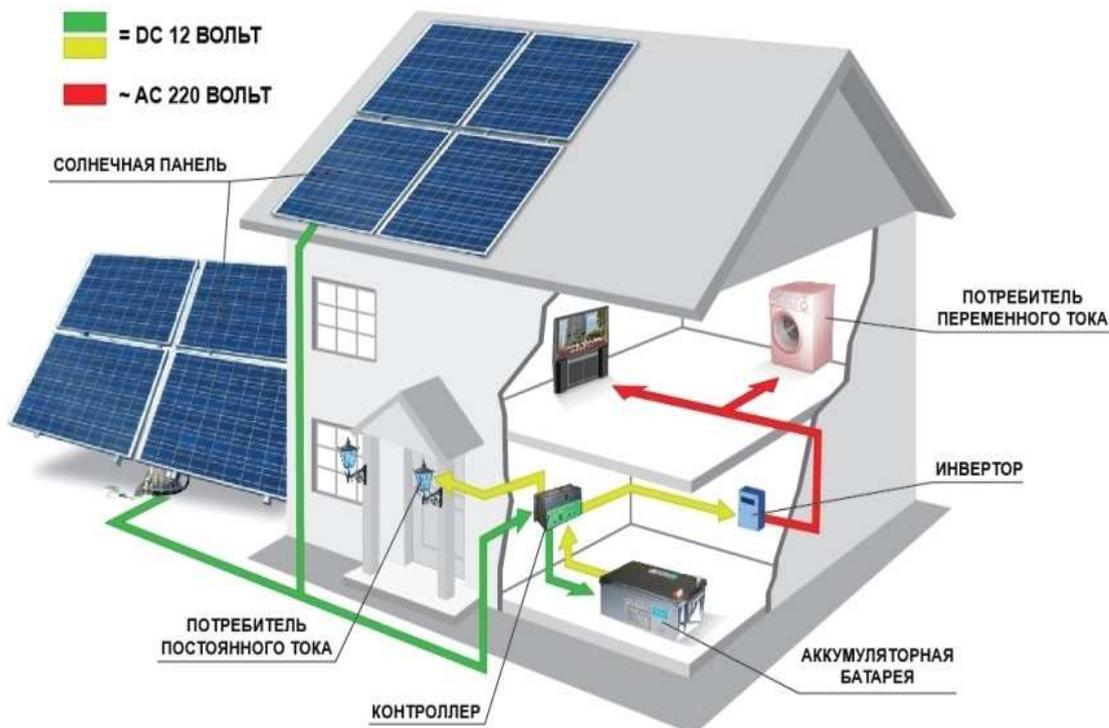
INTRODUCTION

Extensive use of alternative energy sources is in line with the priorities and energy security objectives of each country and is one of the fastest growing areas of the energy sector. Uzbekenergo is working on the development of renewable energy sources in the country, first of all, the use of hydropower potential. Uzbekenergo has begun work to prepare for the implementation of investment projects for the modernization and reconstruction of existing hydropower plants. It is planned to modernize and reconstruct the 14th HPP and Farhod HPP in the Lower Bozsuv cascade. As a result of the implementation of the measures envisaged in the program, by 2015, to ensure the sustainable operation of energy systems and further development of energy, 1 billion. It is planned to achieve savings of more than m3 of natural gas, reduce the specific energy consumption of electricity generation by 13% and the amount of harmful emissions into the atmosphere by 10%. Decree of the President of the Republic of Uzbekistan "On measures for further development of alternative energy sources" No. PQ-4512 dated

01.03.2013 and "On the establishment of the International Solar Energy Institute" dated 01.03.2013 As part of the implementation of the decision No. PQ-1929, the Institute of Solar Energy was established on the basis of the Scientific-Production Association "Physics-Sun". Uzbekenergo is one of the founders of the institute. In order to use solar energy, Uzbekenergo has installed solar devices in Muruvvat Uylari, Mehribonlik Uylari and rural medical centers in a number of regions of the country. In addition, a solar power plant with a capacity of 100 MW is planned to be built in Samarkand region with the help of loans from the Asian Development Bank. In addition, in 2013, the first stage of a joint venture for the production of photovoltaic solar panels with a capacity of 50 MW will be established at the Navoi Free Economic Zone. In the future, the plant's production capacity will be increased to 100 MW. In this regard, Uzbekenergo is working to include renewable energy sources in the fuel and energy balance. Large-scale industrial use of renewable energy sources will reduce the consumption of natural gas in the production of electricity and heat in the country and, as a result, significantly reduce the volume of emissions of harmful substances into the environment. The analysis of the assessment of the gross and technical potential of renewable energy sources in Uzbekistan is based on the following conclusions: the availability of a number of renewable energy sources throughout the country, its environmental safety, energy efficiency shows the need for a radical overhaul of energy use strategies for both the near and long term.

Function:

The rapid development of science and technology in line with modern requirements is leading to an increase in demand for electricity. According to statistics, in 2020 the demand for electricity will increase by 1.7 times compared to 2018. These reasons now require a comprehensive study of energy sources, the efficient use of alternative energy sources, and the development of measures to increase the efficiency of existing power generation technologies (FIC). We know that today there is a wide range of issues related to the creation, study and application of solar trackers in solar power plants. The advantages of solar power generation over other types of power generation are its safety, relative cheapness, and ease of use. One of the main factors in increasing the efficiency of solar elements is the placement of the element at an optimal angle. The presence of an insufficiently illuminated area on the surface of the solar cell reduces the value of the output voltage from the solar cell. That is, the constant change in the angle and azimuth of the sun causes a number of problems in maximizing the potential of photographic and thermal devices. These problems directly affect the efficiency of the device. The above problem can be effectively solved by determining the optimal positioning angle of the solar panels, in part, or by installing the solar panel on the solar tracker, an automatic solar coordinate detection system.



1-Figure: scheme at home

Loss 90 1.2% 180 4.9% 400 19% 450 29% According to the data given, the change in the percentage of loss is not linearly correlated, and with the increase in the error angle, the loss percentage in each interval is correspondingly greater. we can observe that Based on the above data, if the angle of inclination of solar panels installed in the territory of Fergana region is 60-610, it is expected that the F.I.K.i of these solar panels will be closer to the ideal values. However, this is a specially calculated value for solar panels over a period of time, without taking into account external factors. In the photocell mounted on the solar tracker, the F.I.K. significantly different from a fixed cell photocell. If the maximum power that can be obtained from a standard photocell is conditionally equal to 100%, it is estimated that the maximum efficiency of a static-based photocell is 63% and the average efficiency is 20-23%. . The maximum and average efficiency of solar cells mounted on a solar tracker is 97.5-62%, respectively. One of the main disadvantages of photocells mounted on a solar tracker is the increase in temperature in this element. Therefore, the use of photovoltaic cells in a photothermogenerator mounted on a solar tracker [5-6] and their connection to an additional cooling system can ensure the stability and high efficiency of the indicators obtained from them.

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