IMPLEMENTATION OF MINI SOLAR POWER PLANTS IN RESIDENTIAL HOUSES

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Abstract. This article was prepared on the application of mini solar power plants to residential houses

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In recent years, large-scale work has been carried out to improve energy efficiency and expand the use of renewable energy sources in the economic and social sectors of our republic [1]. Today, the further development of renewable energy sources by our country and the adoption of a number of decisions and decrees by the president in this regard indicate how much the industry is growing on a global scale. Wide introduction of renewable energy sources in social and housing and communal services and economic sectors, ensuring compensation of energy deficit in the republic's territories by increasing energy efficiency, comprehensive organization of work in this regard, and development of favorable conditions and incentive mechanisms for investors output is one of the important tasks of the field. This decision of the President of the Republic of Uzbekistan, No. PQ-57 dated 16.02.2023, that is, "On measures to accelerate the introduction of renewable energy sources and energy-saving technologies", serves as the program for the execution of these works. The plan to install 20,000 small-capacity renewable energy sources in public facilities and government offices per year is included in the program [2-3].

MAIN PART

The history of using solar energy in Uzbekistan began in the 70s of the 20th century. At that time, the magazine "Heliotechnika" started to be published, and a decision was made to build a solar oven necessary for testing materials that can withstand temperatures of more than 2000 degrees. In 1929, evaporation of tobacco extract using sunlight was carried out (A.I. Lastak), in 1930, experimental greenhouses heated by sunlight were built (L.N. Satikov), in 1934, a heliotechnical

laboratory was established in Tashkent, and in 1943, within the framework of the Institute of Physics and Technology of Uzbekistan FA a heliotechnical laboratory was established. Solar water devices, fruit dryers, solar cocoon coolers and dryers, and solar sulfur liquefaction device were developed and put into practice. In 1946, a paraboloid device with a mirror diameter of 10 meters was built in Tashkent. This device made it possible to conduct research related to room heating and air conditioning, steam and ice extraction (G. Y. Umarov). The first helioapparatus factory was built in Bukhara (1978), producing a large number of helio water heaters and helio kitchens [4-9].

In 1963, the Department of Geophysics was established, where devices were created that pulsed solar energy before planting the seeds of agricultural crops without the use of toxic chemicals. Taking into account the practical importance of large solar concentrators, academician S.A. Azimov a scientific production complex including the "Big Solar Cell" (KQS) with a heat capacity of 1000 kW was created under the leadership of The large solar farm of the complex was launched in 1987 in the Parkent district, 45 km from the city of Tashkent. Until now, such a device existed only in Odeo (France). The concentrator of the device is a paraboloid with a cut from the top and bottom and a focal length of 18 m, and has a size of 54x42 m. The heliostat area (the area where the mirrors are located) consists of 62 heliostats of the same size, located in a certain order on an inclined plane. The task of the field is to provide the concentrator with sunlight in the direction of its optical axis throughout the day. In 1993, the Institute of Materials Science was established within the "Fizika-Quyosh" scientific production association. At present, the great scientists of the institute are Risqiyev T.T., Odilov G'.T. and others, extensive scientific research is being conducted in the field of physics of difficult-to-melt materials [10-15].

The Earth's atmosphere, based on its optical properties, is a selective light filter that modifies solar radiation coming from space. If the radiation flow passes through the atmosphere and falls vertically on the Earth's surface, then the optical distance traveled by the radiation is considered to be equal to one atmospheric mass and is denoted by AM1. The length of the optical distance of obliquely incident rays can be determined by comparing them with the magnitude of the optical distance AM1. If the radiation flux does not change under the influence of the atmosphere, its optical atmospheric mass is equal to zero, and it is designated as AM0 [16-20].

The energetic illumination of the Earth's surface in the open air during twilight at sea level of directly incident solar radiation is estimated to be equal to ≈100 mW cm2.

Insolation refers to the amount of solar radiation falling on the Earth's surface in a certain geographical area. Insolation depends on the seasonal fluctuations of the distance in the Earth-Solar system, geographical latitude, the environment of the area and the mass of the atmosphere.

CONCLUSION

Development of solar energy in Uzbekistan, conversion of solar energy into electricity, determination of the main parameters of solar cells. In the conditions of Uzbekistan, it is aimed to improve the efficiency of small solar power plants by applying electr mechanical systems. In addition, the commissioning scheme of the solar power plant is given with drawings of various structures for their installation.

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