THE REVOLUTION OF SOLAR ENERGY

Xakimov Temurbek
Assistant of Andijan Machine building institute, department of alternative energy sources, Uzbekistan, 170119, Andijan city. 56 Babur shokh Street
tyoma37@gmail.com
Abdullayev Sherbek
Student of Andijan Andijan Machine building institute, department of alternative energy sources, Uzbekistan, 170119, Andijan city. 56 Babur shokh Street
abdullayevsherbek25@gmail.com

Abstract: In this article, we can see when the use of solar energy began in our country and the stages of its development. At the same time, we will consider the first solar-powered devices built in Uzbekistan, the establishment of scientific facilities related to this direction, and the solar power plant built at the Andijan Mechanical Engineering Institute.

Key words: Heliotechnics, heliophysics, sunlight, solar dilution device, large solar sandbox

Introduction

The history of using solar energy in Uzbekistan began in the 70s of the 20th century. At that time, the magazine "Heliotechnika" began to be published, and a decision was made to build a solar oven necessary for testing materials resistant to temperatures of more than 2000 degrees. In 1929, evaporation of tobacco extract using sunlight was carried out (A. Lastak), in 1930 experimental greenhouses heated by sunlight were built (L.N. Satikov), in 1934 - a laboratory of heliotechnics in Tashkent, and in 1943 - the Faculty of Physics and Technology of Uzbekistan A heliotechnical laboratory was established as part of the institute. 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 the city of Bukhara (1978), producing a large number of helio water heaters and helio kitchens [1-5].

In 1963, the Department of Geophysics was established, in which devices were created that process solar energy with pulsed light before planting seeds of agricultural crops without the use of toxic chemicals.

MAIN PART

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 thermal 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 above and below and a focal distance 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 different sizes, located in a certain order on an inclined plane. The 13th 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 scientific production association "Fizika-Quyosh". 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 hard-to-melt materials [6-9].

The sun shines 320 days a year in Uzbekistan. The decree of the 1st president of our country dated March 1, 2013 "On measures for the further development of alternative energy sources" defines the strategy for the development of renewable energy in our country.

In international energy practice, hydro, solar, wind, geothermal, geothermal, and biomass energies are recognized as alternative sources. Among them, one of the most promising directions is undoubtedly the use of solar energy. According to the decision of March 1, 2013. The International Solar Energy Institute was established on the basis of a number of scientific institutions of the Academy of Sciences of the Republic of Uzbekistan.

The main tasks of this institute are to carry out scientific and experimental research and innovative developments in the field of using solar energy based on the expansion of international cooperation, to develop proposals for the practical application of the potential of solar energy in various sectors of the economy and in the social sphere based on advanced and economically effective solar technologies and solar devices.

It is expected to establish a joint venture producing photoelectric panels in the Navoi free industrial-economic zone. It is planned to build a solar photoelectric plant in Samarkand region, and a project for the construction of a solar photoelectric plant with a capacity of 100 megawatts has been prepared [10-15].

Determining the distribution of solar radiation power of six regions, which are acceptable for the construction of several large solar power plants, based on new technologies with high efficiency, is underway.

A unique scientific object - the "Physics-Solar" scientific-production association of the Academy of Sciences of the Republic of Uzbekistan modernized the Large Solar Furnace of the Institute of Materials Science (Fig. 1.1) and equipped the International Institute of Solar Energy with laboratory-measuring equipment and other equipment. Implementation of the technical assistance project is also underway

Fig.1.1: Large Solar Furnace of the Institute of Materials Science.

In the territory of the special industrial zone "Angren" with the participation of the company "Shindong Enerkom" (Republic of Korea), the construction of the second factory for the production of technical silicon was completed (Fig. 1.2), and the first solar power plant, which was also put into operation at the Institute of Mechanical Engineering of Andijan region, was tested, and the institute's alternative It was launched by professors of the department of energy resources (Fig. 1.3) [16-20].

Fig.1.2: View of the solution in a special container at the plant of Angren Uz-Shindon OJSC

Fig.1.3: Solar power plant at the Andijan Mechanical Engineering Institute.

As a result of the widespread use of these advanced technologies, it will be possible to save 2 billion kilowatt-hours of energy produced in the energy system of our country in the near future, and to produce nearly 2 million gigacalories of thermal energy. This ensures the saving of energy resources worth more than 250 million dollars per year [21-25].

CONCLUSION

There is a strong interest in the implementation of alternative energy in Uzbekistan, the development of alternative energy will lead to the creation of thousands of new jobs in the field of high technologies.

Considering that the demand for electricity is increasing day by day, I designed a small solar power plant in my graduation work. As a result, we considered how to get the electricity needed for one household in a minimal and clean way. In this, we determined the solar constant through a mathematical expression. The advantage of this is that since the solar constant is different in each region, it can consider its characteristics depending on the region in which the solar power plant is installed. This is useful for us as an example of how to distribute the electricity needed for the house and choose how many kilowatt panels to install. For example, we can take into account how many degrees and how many hours Kuyposh panels face the sun, depending on the value determined by the solar constant. Then our work will be easier.

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