

THE FUTURE OF SOLAR ENERGY

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Annotation. The general information about solar energy is given in the article. It is also said how solar energy is absorbed and transformed. There is an outline of the advantages and disadvantages of the usage of solar energy.

Keywords. solar energy, silicon, solar cell, photovoltaics, concentrated solar power

Introduction. Solar energy is the technology used to harness the sun's energy and make it usable. In its most primitive form, humanity used this type of energy in ancient times. People warmed food, water; even their houses were specially built to receive as much sunlight as possible so that they would continue to be relatively warm even at night.

After a while, our needs have changed a lot. Now it is not enough for us just to be able to cook food and live in warmth, now we need to power the entire planet with electricity, while not polluting it. One of these types of extracted energy is solar energy [1].

Main part. To extract energy from the sun in the form in which we know it now, humanity had to travel a long way. The first steps towards converting solar energy into electrical energy were made in 1839, when the French physicist Edmond Becquerel discovered the photoelectric effect. Later, in 1876, London Professor William Grylls Adams and his student Richard Evans Day observed the photovoltaic effect when light was exposed to selenium, which gave rise to the idea of creating a photovoltaic cell, which was implemented already in 1883 by Charles Fritz.

So, the first device for converting solar energy into electrical energy was created – a solar battery [2].

To better understand what the future holds for solar energy, we will focus on the specifics of how this energy is absorbed and transformed. At the moment, the use of solar energy on Earth is conducted in two directions: passive and active. Both methods have their own features and capabilities that should be considered more carefully.

Passive solar technologies do not use any external devices. As an alternative, they take advantage of the local climate to heat structures during the winter, and reflect heat during the summer. In the modern world, interest in the construction of passive solar systems is increasing, then falling again. The energy crisis forces us to actively look for ways to obtain cheap alternative energy, but with improvements in the economic situation, the situation is turning in the opposite direction. However, the general situation demonstrates the constant development and promotion of solar systems in technology and everyday life.

Active solar technologies use electrical or mechanical devices to actively transform solar energy into another form of energy, generally heat or electricity. There are quite simple and more complex constructions that perform different tasks. According to their functionality, they can be divided into photovoltaic cells and solar collectors.

Photovoltaic cells are engaged in generating electric current from the energy received from our luminary. Nowadays, photo electrics are probably the most well known way to use solar energy. Photovoltaic arrays usually include solar panels consisting of an incredible number of solar cells.

Each solar cell contains a semiconductor, regularly made of silicon. When the semiconductor absorbs sunlight, it knocks electrons loose. An electrical field directs these loose electrons into an electric current, flowing in one direction. Metal contacts at the top and bottom of a solar cell direct that current to an external object. The external object can be of any size, which clearly affects its use.

Concentrated solar energy also called concentrated solar power technology uses lenses and mirrors to focus sunlight from a large area to a smaller one. This intense area of radiation heats a

fluid, which in turn generates electricity or fuels another process. After we have considered how the main devices for converting solar energy are arranged, we will move on to their advantages and disadvantages [3].

To begin with, consider the advantages. Probably, the main advantage of using solar energy is its limitlessness. The sun will exist for a long enough time, so, it is not necessary to worry about this for several billion years.

An equally important aspect is the purity of this resource. After the equipment for solar technologies is designed and put into operation, solar energy does not need fuel to work. There are also no greenhouse gases or toxic materials in it. The spread of the use of solar energy in the future can significantly reduce the negative impact that we have on the environment.

Do not take the following advantage lightly. Solar cookers can serve as a kind of cleaner alternative to conventional stoves used for cooking or water purification. It may also affect the spread of technologies using solar energy.

In addition, solar energy complements other renewable energy sources, such as wind or hydroelectric power.

A person who has installed solar panels can produce excess electricity. Thus, anyone selling this energy can reduce or even eliminate electricity bills, which in the long run can become a very profitable investment.

Now let's move on to the disadvantages. The main limiting factor for the use of solar energy is the price of the equipment necessary for this. The purchase and installation of equipment can reach tens of thousands of dollars. Although the government often offers reduced taxes to people and businesses using solar energy, and the technology can eliminate electricity bills, the initial cost is too high for many to start using it right now.

To upgrade or install solar panels on the roof of a building, the roof must be strong, large, and oriented in the direction of the sun's beam, which can also be included in the price problem.

Both active and passive solar technologies depend on factors that are beyond our control, such as climate and cloud cover. If we are talking about larger enterprises, it is necessary to study local areas to determine whether solar energy will be effective in this area.

Sunlight must be abundant and consistent for solar energy to be an efficient choice. In most places on Earth, sunlight's variability makes it difficult to implement as the only source of energy [3].

Conclusion. We have considered the main advantages and disadvantages, examined how solar energy is absorbed and converted. Even despite the drawbacks, solar energy use has surged at about 20 percent a year over the past 15 years, thanks to rapidly falling prices and gains in efficiency [4].

In addition, the energy of the sun remains limitless. This gives grounds to predict the constant development and promotion of technologies for obtaining and processing solar energy, the emergence of more efficient equipment, an increase in the share of solar energy in the total consumption of mankind. Statistics show that a giant leap has been made in this direction over the past 10 years, so the future is definitely behind solar energy.

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