УДК 620.91

PROBLEMS OF THE SOLAR PERSPECTIVE

Karpeychik D.A., student
Liakhovich V.V., student
Scientific supervisor – Matusevich O.A., senior lecturer
English language department №1
Belarusian National University of Technology
Minsk, Republic of Belarus

It is an incredible fact that today the sun is the cheapest source of energy, even cheaper than coal. It is strange that at the same time, only 3% of all electricity in the world is generated by sunlight. Why is there so little, you may ask? And why is solar energy the most affordable option? So, let's get this straight. First, let's see how much the prices of solar energy have fallen. In early 2005, the cost of each watt of energy produced by a solar panel was about $4. Today, the price has dropped to 20 cents for the same watt [1]. How did this happen? Everything is simple. The cost of inventing solar panels has become lower due to the development of technology. Also in 2000, Germany created a market for the invention of renewable sources, which was a big step forward. A law passed by the German government guaranteed fixed tariffs for the purchase of energy generated by wind and solar. A huge role was played by China, where the mass production of solar panels began.

So now we have clean solar energy, the production of which is also economically profitable. But then why don't they get energy only with the help of the sun? The fact is that solar energy has one big problem: energy is generated only when the sun is shining. In cloudy weather or at night, even the best panels are completely useless. And that's the problem, because that's when we need solar energy the most.

Let’s look at how we use electricity. In the morning, when we wake up and go about our business, we need electricity. Demand also remains quite high after the morning peak. In the evening, when we return home, demand increases again, but at night it decreases. Now, let's look at how demand is changing where there is a lot of solar energy, for example, in California. The same thing is in the morning. Then the sun rises and the production of solar energy begins. Demand for non-renewable energy decreases, but only before sunset, and then it increases again.

There are two problems here. First, traditional power plants cannot dramatically increase energy production. Because of this, they must maintain a certain power throughout the day, even with the use of solar energy. This means that more energy will be produced during the day than is used. This leads to the second problem: only a limited amount of energy can be supplied to the grid. Too much solar energy can lead to overload, and then it will need to be disposed of. This reason has always been an obstacle to using large amounts of solar energy. However, it is now possible to solve this problem using lithium-ion batteries. By connecting these batteries and increasing the number of connected ones many times, energy storage devices are obtained that can be used in solar panels. Recently, projects have appeared in the field of solar energy that allow energy to be stored for several hours. As a result, energy consumption shifts from the middle of the day to the evening, when demand is higher. Recent years have shown that lithium-ion batteries have become much better and much cheaper than expected. They have become a viable alternative for storing large amounts of solar energy, at least for a few hours. Solar energy storing turns out to be such a big problem. Sometimes, however, it is necessary to accumulate energy for a longer period of time. For example, where the sun does not shine often. That's why companies are working on other technologies. Another type of battery is flow-through electrochemical. They have two advantages: they store more energy and last longer. The problem is that they are quite expensive. The next option, which is already in use, is a hydraulic storage tank. Here we need two reservoirs, which are located on top of each other. During the day, solar energy is used to pump water up upward. At night, the water goes down through the turbine. However, this design requires a lot of space. So, solar energy has become cheap and its main problem has been solved. And what happens now? Solar energy will be everywhere, and that's a fact. In our opinion, by 2030, the share of solar energy in the global energy mix will reach 20% or even more. So, the current technological breakthrough opens up really sunny prospects for the global electric power industry.

References

1. What is Solar Energy in Simple Words? // Medium. – URL: https://medium.com/@solarhotspots/what-is-solar-energy-in-simple-words-5ecb646cec1a (date of access: 13.03.2025).