

## TYPES OF SOLAR CONCENTRATORS, THEIR ADVANTAGES AND DISADVANTAGES

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**Abstract:** Today, the demand for electricity is growing worldwide due to population growth and industrial development. Therefore, obtaining and supplying cheap, efficient and environmentally friendly electricity remains one of the most pressing issues today. One solution to this problem is to generate electricity using alternative energy sources (solar, water, wind, biogas, etc.). Photocells and solar concentrators are also used in the above-mentioned solar energy. This article discusses the history of solar concentrators and their development prospects.

**Keywords:** Solar, water, wind, biogas, parabolosylindrical concentrator, parabolic concentrator, fresnel mirror concentrator, focused heliostat concentrator.

### Introduction.




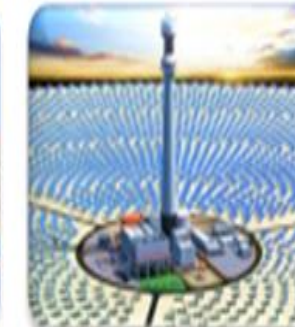
The sun’s rays bring enormous amounts of energy to the earth each year,  $62 \cdot 10^{16}$  kWh [3]. About 60 percent of this energy is used to heat the earth’s atmosphere, 25,5 percent to heat the oceans and seas, and 14,5 percent to heat the land. Of this, 2,5% is converted into mechanical energy by wind, 0,14% into mechanical energy of river movement, and 0,12% into chemical energy of various fuels such as firewood, peat, coal, oil and shale [4]. Considering that the surface area of the Earth is  $127,6 \cdot 10^6$  km<sup>2</sup>, the energy of sunlight falling on the Earth is  $176,6 \cdot 10^{12}$

kWh, which means that  $1,56 \cdot 10^{18}$  kWh  $\approx$   $1,6 \cdot 10^{18}$  kWh of sunshine per year. energy decreases [6].

One of the main types of solar energy efficient devices is solar concentrators, and there are many types. To date, there are four major categories of solar concentrators around the world.

They are used in addition to solar panels to heat cold water and generate electricity. And it is used as an external heat source for Stirling engines. The parabolic concentrator provides a focal temperature of about  $300^\circ\text{C}$  to  $400^\circ\text{C}$  [1]. including cooking and boiling water very quickly. The heater, which is a heat carrier in focus, even heats running water quickly and is used for domestic purposes, such as showering and washing dishes. [5]

## Types of concentrators

Parabolosylindric	Parabolic	Fresnel mirror	Focused heliostats
			

### Advantages and disadvantages of concentrators

#### 1. Advantage of parabolocylindrical concentrator.

- Proven technology

#### Disadvantages

- High costs

- Constant monitoring
- The need for leveled large areas

## **2. Advantage of parabolic concentrator.**

- Stirling motors can generate electricity
- You can cook using solar energy
- Materials that melt at high temperatures can be melted

### **Disadvantages**

- The appliance must be operated frequently to maintain a constant high temperature

## **3. Advantages of Fresnel mirror concentrator.**

- Cheap energy
- Has a simple structure

### **Disadvantages**

- This type of device has not been tested much.

## **4. Advantage of focused heliostat concentrator.**

- High efficiency
- High temperature
- Cheap energy
- There is no need for flattened areas

### **Disadvantages**

- High price
- Rare

In short, today, the production of devices that convert solar energy into electricity is very well established. However, the high cost of these devices remains a key factor in their popularity. That is why all over the world, especially in our country, scientific research is being conducted to obtain new, cheap, efficient and environmentally friendly solar cells that convert solar energy into electricity.

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