



convert the DC current produced by the solar modules into alternating current, standard frequency and amplitude, and direct it to the line. The SMA network inverters have high efficiency (up to 99%) and are protected by a housing of different operating conditions.

References

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ALTERNATIVE SOURCES OF ELECTRICITY PREMIERE IN THE SYSTEMS OF TELECOMMUNICATIONS

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The modern market is considered one of the most promising in terms of alternative energy in the world.

However, energy efficiency in the country is developing at a slow pace. While a 3-5-kilowatt connection at a remote location with the installation of 40 poles will cost 19 million - the same is an autonomous power station - the consumer often prefers centralized systems. Often the reason for this decision is not the high cost of equipment for a solar power station or the reluctance to mess with documents, and the elementary ignorance of the matter.

What do you need to know about an individual solar power plant?



Fig. 1. Advantages and disadvantages of using solar panels



Benefits:

- Renewability

Unlike fossil fuels - coal, oil, gas, which are not being restored, the resource of the Sun, according to NASA, is at least 6.5 billion years.

- Eco logicality

The use of solar power plants is practically not accompanied by harmful emissions into the atmosphere. Compared with traditional sources of energy, this impact on the environment is negligible.

- Economical, low operating costs

Users of solar panels are independent of the growth of energy prices, while maintenance of solar-powered power systems is characterized by low costs - it is only necessary to clean solar cells several times a year, and the manufacturer's warranty on them is usually 20-25 years [1] .

Disadvantages:

- High cost

Installations of the entire generating set for a private house will cost in the amount of 7 thousand dollars and above.

- Inconsistencies

Due to the fact that sunlight is absent at night, and also on cloudy and rainy days, solar energy can not be considered a stable source of electricity. To accumulate it, you need to install additional equipment.

- High cost of energy storage

Batteries that allow you to accumulate energy and smooth, to some extent, the instability of solar energy supply, is distinguished by a high price that is not available to every homeowner.

- Minor pollution of the environment

Some technological processes for manufacturing solar panels are accompanied by the emission of greenhouse gases, nitrogen trifluoride and sulfur hexafluoride.

- Low power density

One of the important parameters of the electric power source is the average power density, measured in W / m^2 and characterizing the amount of energy that can be obtained from a unit of energy source area. This indicator for solar radiation is $170 W / m^2$ - it is more than other renewable natural resources, but lower than oil, gas, coal and nuclear power. For this reason, to generate 1 kW of electricity from solar heat requires a large area of solar panels [1].

Due to low power density, the energy generated by solar batteries is problematic for devices and equipment that requires high power.

For example, during a heavy snowfall, the solar station will not work. And although there are about 20 such days in the year, from the inclusion of energy-intensive equipment - an oven, a boiler and a dishwasher - will have to be abandoned. For such cases, you can buy a small generator (power of 1-2 kW) - it is enough to charge batteries.



Also in the area of your residence often falls hail, there are storms, this is certainly a serious problem, because solar photovoltaics are quite easy to damage. In this case, the installation of a photovoltaic power generation system will require additional costs to protect it [2].

There are three types of solar systems

1. Systems in which solar heat is transferred to the heat carrier (antifreeze or water) circulating between the storage tank and the solar collector panel. Such systems have the highest efficiency.

2. Systems that heat air flowing from a room through a solar screen, after which heated air flows back into the room. Such systems are rarely used.

3. Solar batteries that produce directly constant electricity, which accumulates in large-capacity batteries and through a constant-energy converter into a variable is given to the consumer.

Very often 1 and 3 type work in complex. For example, batteries provide electricity for lighting and household appliances, and the collector heats the house and provides hot water.

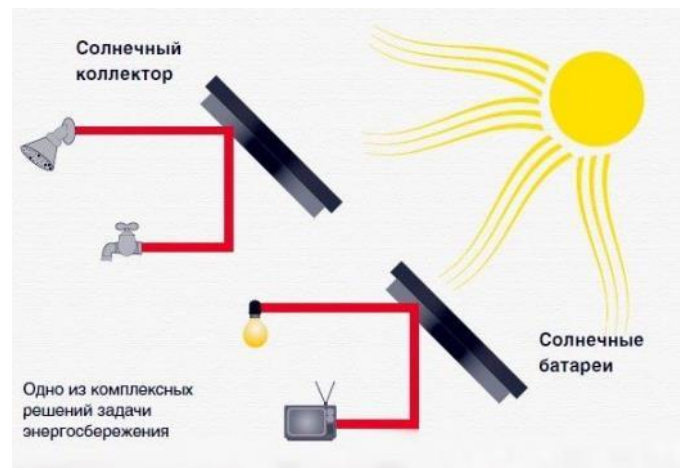


Fig. 2

How it works

The principle of solar cells is to produce a direct current due to the sunlight on the silicon wafer: the sun's rays hit the surface of the plates and shift the silicon electrons from the atomic orbits.

At the same time, the efficiency of solar batteries depends not only on the size, but also the intensity of the solar radiation, as well as the position of the solar modules. Therefore, the efficiency of batteries affects the weather, season, geographical location, etc.

The solar battery is a complex system in which a number of auxiliary devices are used to transfer energy to the consumer:

- DC converter - solar panels are capable of producing only a direct current, so an inverter is required to convert it;
- A power accumulator (battery) that emits current when the battery itself does not function (at night, for example);
- Voltage stabilizer, which equalizes the current drops;
- Battery indicator that monitors the charge [3].



Fig. 3

Solar panels for a house in the village

The climatic conditions in the village make the use of solar batteries advantageous: on its territory, annual solar radiation per square meter exceeds 5000 MJ.

Such indicators allow to receive up to 120 W of power from one square meter of battery, so for a family consuming an average of 250 kW of energy per month, there will be enough battery with a total area of 7-10 sq.m.

Before buying solar panels for the house will need to perform a preliminary calculation taking into account the climatic features of the territory. However, the supplier company will do it.

Insolation rate (kWh / m² / day) for cities by months, which helps to calculate the real efficiency of solar panels for the house.

References

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MODELING OF SELF-ADAPTIVE MEASURING SYSTEM BASED ON EDDY CURRENT SENSORS

(Ostbayerische Technische Hochschule Regensburg; Micro-Epsilon Messtechnik GmbH & Co. KG, Germany; Samara National Research University, Russia)

Eddy current method finds a wide application in automation systems and control, in particular for the constructing sensors being designed for contactless measurement of the position of conductive objects, their electrical parameters and temperature, thickness of sheets and foils, etc. An important advantage of eddy current sensors is insensitivity to the influence of environmental parameters such as humidity, pollution, temperature, electromagnetic radiation, etc [1].