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A PORTABLE SOLAR POWER STATION AS AN ALTERNATIVE ENERGY SOURCE.

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A stand model of a portable solar power station is designed for a clear example of its performance at different angles of sunlight at different times of the year and time of the day. It allows you to charge a phone or tablets several times.

Модель стенда портативної сонячної електростанції розроблена для прикладу її продуктивності під різними кутами сонячного світла в різний час року та часу дня. Це дозволяє заряджати телефон або планшет кілька разів.

Problem setting. In our time people need a lot of electricity because they invent more and more new electronic devices. Also electric power becomes always more expensive, traditional sources are exhausted and that's why we should choose wide spread using of alternative sources of electricity. Almost all sources of energy, anyway uses the energy of the Sun: coal, oil, natural gas are nothing else, as "conserved" solar energy. Solar energy as forme is the most interesting one and that's why I decided to study it. It contains in it fuel from the unremembering times; due to the action of solar heat and light of the Earth grew plants, accumulated energy by itself, and then as a result of long processes it had turned into the fuel which is used today.

Alternative energy sources are renewable types of resources; they replace traditional sources of electricity. Such as gas, oil, coal and nuclear fuel. When they burn, they release carbon dioxide into the atmosphere, which contributes the growth of the greenhouse effect and global warming. Also, traditional sources of energy have not been left for many years; according to this humanity is necessary to switch to alternative energy sources among which are (energy of the sun, wind, bio fuel, hydro power, energy of rivers and undercurrents). Solar power generation is a pure alternative to electricity from produced fuel, without air and water pollution, no global pollution of the environment and without any threats to our public health. A total of 18 sunny days on Earth contains the same amount of energy that is stored in all the reserves of the planet coal, oil and natural gas.

The purpose of the article is to check the work of solar panels at various angles of sunlight and to test the work of solar panels in the winter season.

Analysis of the recent research. The first solar cells gave a huge start to the development of the satellite structure for which the solar battery was the best way to charge own batteries.

The power of the energy of the sun that comes from the sun is 1800000000 GW. For a day to the Earth from the sun comes more heat than mankind received from the burning of a fuel for 100 years (1300 GW). Solar energy can be used as in the process of converting the energy of the sun into electricity and into solar heat for human needs.

The first prototype of solar batteries was created by the Italian photo chemist Giacomo Luigi Chamochan. April 25-th, 1954. These were the first solar cells based on silicon to produce an electric current with an efficiency of 4%. The first solar cells gave a huge start to the development of the satellite construction for which the solar battery was the best way to charge your own batteries.

Basic research materials. My model is a stand model of a portable solar power station which is designed for a clear example of its performance at different angles of sunlight at different times of the year and time of day. To produce this demonstration stand, single-crystal solar panels with a power of 5W at 4.7V with a current strength of 30 A, a charge controller board with auto protection from overcharge and discharge of the battery and a charge indicator were used, and also lithium batteries with a capacity of 10 Amperes per hour. That allows you to charge a phone, tablets several times.

During the test, the following drawbacks were identified: In winter, due to the short duration of daylight hours, this installation is not very effective compared to the summer period. The second major drawback is overcast sky, since solar cells that are shaded instead of converting electrical energy begin to consume it. Also, for installation of solar power plants, large open areas are needed, so CEs convert too little electricity to $1 \text{ m}^2 \text{ 1m}^2 = 1 \text{ V}$.

The network solar electric station will not allow you to pay for the consumption of electricity and also receive some income from the sale of surpluses in the "green tariff" (1 kW - 0,18 euro). The solar station 10kW per year will generate in the average 11000kW. The investment of the products in the solar power plant gives you:

- A returning of investments from the sale of surplus electricity to the "green investment" for 5-7 years (depending on the power of the station, the stronger is the power the shorter is its pay-back).

- Absence of electricity bills.
- Solar actuators are simple in their work
- The service time of the station is minimum 25 years.

Conclusion.

Solar power generation is a pure alternative to electricity from produced fuel, without air and water pollution, no global pollution of the environment and without any threats to our public health

References

1. Солнечная энергетика [Електронний ресурс]. – Режим доступу: <https://alteco.in.ua/technology/solar-energy>
2. [Електронний ресурс]. – Режим доступу: <https://hromadske.ua/posts/enerhiia-sontsia-elektrostantsiia-u-sebe-vdoma-biznes>
3. Заробляємо на енергії Сонця. Гаряча вода і власна електроенергія / [Електронний ресурс]. – Режим доступу: <http://www.slk.kh.ua/news/suspilstvo/zaroblyayemo-na-energiyi-sontsia-garyacha-voda-i-vlasna-elektroenergiya.html>
4. Зелений тариф і електроенергія від сонця [Електронний ресурс]. – Режим доступу: http://aom.at.ua/publ/zelenij_tarif_i_elektroenergija_vid_soncja/1-1-0-18