

SOLAR ENERGY IN RUSSIA**Mikhaylov. A. U, Kolenchukov O. A****scientific director: Melnichenko K. A. teacher . Urlov P. V. teacher****Siberian Federal University****Oil and Gas Institute****Topicality**

Natural resources for humans is a special reserve, which helps us not only to exist, and to find food. Just natural resources allow you to open and modernize our lives. Unfortunately natural resources used now is not renewable, and after a certain period of time they will disappear.

Modern people are already trying to find an alternative. Looking for new sources of energy. One of these is solar power. This kind of energy is renewable so attractive to use.

Objective: analyzes the rationality of using solar energy in Russia.

introduction

Incarnation optimistic forecasts in reality largely due to the level of technological development. At the moment, there is technological ability to extract from sunlight only a minor part of the energy, but even this amount is already significant for the European energy infrastructure, where renewable, including solar power, is given not less than 20% by 2020.

The world solar energy industry is developing rapidly, solar power plants are part of the energy infrastructure, and a rapid increase in the total capacity of power plants using geliosyre also involves the growth of the influence of solar technologies on the economy. First of all, in the coming decades, solar energy will be a stimulus for economic development of the equatorial countries that have the highest "sunny" resource.

The total development of solar energy in the world

Figure 1. World production of solar cells.

Despite the widespread practical use of solar panels in space, large-scale production of terrestrial photovoltaic installations in Russia yet.

Production of household photovoltaics are currently engaged in about 15 domestic manufacturers.

Scale production of these enterprises is extremely small. Typically, the production of solar cells is entirely focused on the specific orders, mainly from overseas buyers. Of all the Russian manufacturers of solar cells only have certificates RZMKP "Rostest" and ISO.

Do not forget about the quality of Russian production, which is still far behind the world's largest producers.

Currently, large-scale high-tech production facility for the production of polysilicon created in the Irkutsk region, enterprise-based company «Nitol Solar». The amount of funds invested in the project "Rusnano" - 7.5 billion rubles.

While in Russia, the share of energy from renewable energy sources (RES) in the fuel balance is modest - only 1%, and most of the energy needs are covered by thermal power plants. In the executive order signed in January this year, spelled out the intention to increase the production and consumption of electrical energy using renewable energy to 4.5% in 2020.

EU countries, for comparison, in 2020 plans to increase the share of renewable energy in the volume of its energy consumption by up to 20%.



Figure 2. Shares of the world production of solar electricity.

Despite the widespread practical use of solar panels in space, large-scale production of terrestrial photovoltaic installations in Russia yet. So the state is directed to the use of resources such as oil, gas, wood and coal, which are the easiest to obtain. The use of solar energy requires new research areas, the development of devices for solar energy. Based on the economy is very bankable enterprise.

The role of solar energy in the future is determined by the capabilities of the development and use of new physical principles, technologies, materials and designs to create a competitive solar power.

According to research in conjunction with the Institute, it was found that in areas of Western and Eastern Siberia and the Far East, the annual solar radiation is 1300 kWh/m². Based on this possible to generate energy from the sun all year round. Thus, it can provide electricity to about 416,000 square meters. meters.

For this are:

- cascade solar cells from semiconductors with different bandgap;
- solar cells with variable bandgap;
- solar cells with impurity energy levels in the band gap.

Reducing the cost of solar power

Cost per installed kilowatt capacity currently stands: for HPP - 1000 2500 \$ / kW for TES - 800 1400 \$ / kW for VES - 800 3000 \$ / kW for nuclear power plants - 2000 3000 \$ / kW.

The cost of a modern SES determined primarily cost solar module produced from the solar cell based on silicon. The production volume of 1 GW / year, the cost of the module is now 3500 4000 \$ / kWh, and the cost of SES - 6000 8000 \$ / kW. However, in 2020, you can reduce the cost of SES to \$ 1,000 / kW.

The main ways to reduce the cost - is to increase the efficiency of solar power systems, solar modules increase the size and scope of their production, reducing the cost of solar silicon, reducing the flow of solar silicon per watt SES, the combined production of electricity and heat with solar energy systems.

denomination	Brand, type	Quantity, pcs.	Value, rubles without VAT, ed.	VAT, total
equipment				
Solar panels to the power plant (SES)		JRM195	52	

Solar Inverter 10kw	TrippleLynx	1	149841,63	149841,63
Accounting and switchboard shield	ЩУРН-3/12	1	863,14	863,14
	ЩРН-12	1	600	600
Zero tire 2x7		1	189,07	189,07
Mercury 230-meter direct connection 10-40A		1	4430,76	4430,76
CPN-M 2/6 to 6 authors.		1	130	120,90
circuit breaker	BA47-29 3P 20A	2	127,42	254,84
TOTAL:				
cable				
cable 2x4	КГХЛ	5	64	320
Cable 3x4 +1 x2, 5	КГХЛ	18	106	1774,44
Cable 3x2, 5 200m	ВВГнг	370	45	15484,50
TOTAL:				
expendable materials				
Gray enamel 2.0 kg	ПФ-115	3		864,00
Roller 100, 6mm Standard Isk.meh (ACOR)		2		70,00
Brush CF (n) 25 * 8sch.		3		48,00
insulating tape		2	28	52,08
Synthetic skin PM 100		3		189,00
Paint Tray 33 * 26 cm		1		50,00
TOTAL:				
material				
Capital investment ACS Batamay				190583,74
4x40 steel strips		0,07	37203,41	2604,2387
Clamp terminal 6-16mm 12par	ЗВИ-30А	3	45	135,00
bolt 6x30		215	1,5	322,50
nut M6		245	0,5	122,50

Ultimately, the amount spent on the creation of a modern SES will okuplena for 1 year, given that this equipment will be serviced and personnel costs.

conclusion

In the course of this work we have studied such as solar energy resource. Was investigated for a better location solar power plants in Russia. Was also calculated approximate estimates for the station equipment. As a result of it has been found that the use of SES will be rational in certain parts of Russia.