DESIGN OF WIND DEVICES LOCATED ON A VERTICAL AXIS

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Annotation: In fact, the 21st century is the age of technology, until today, techniques and technologies have developed a lot and are perfect, popular, convenient and continue to develop.

At the same time, the need for electricity is increasing year by year. For example, ordinary cars are being replaced by electric cars. Also, airplanes, motorcycles, ships and other fuel-powered devices are moving to electricity. And nowadays we cannot imagine our life without gadgets and electronics. With this in mind, we must expand the scale of electricity generation using environmentally friendly and renewable energy sources and leave a legacy of natural resources and a clean environment for future generations.

Keywords: Transports, ecology, generators, energy, wind generators.

There are many types of alternative energy sources. Among them, the most common and more affordable option is wind power plants. Wind energy reserves are a hundred times more than the hydropower reserves of all the rivers of our planet. Winds blow all the time and everywhere on earth - from light breezes that bring much-needed coolness in the summer heat to powerful storms that cause untold damage and destruction. The winds blowing in the vast territory of our country could easily meet all the needs for electricity! Why is such an abundant, cheap and environmentally friendly source of energy underutilized? Today, wind turbines cover only one-thousandth of the world's energy needs.

Humanity from water power and steam engines has been using wind energy for a long time. England, Germany, Wind in France, Denmark, Holland, USA and other countries energy is used on a very large scale, in industry and agriculture bride It is being conducted on the use of wind energy current work on the creation of separate large-capacity wind generators and connecting their energy to existing energy networks and the main is to be used as a network. The circulation of air masses around the Earth's atmosphere experts evaluated differently by Annual theoretical reserve of winds It is 100 times more than all the energy reserves on Earth. It is 3300xl012 kW-h. But this is only energy 10-12% can be used. For example, in 1987 on Earth 10 < 1012 kW-hour energy production by all wind devices issued, that is, only 0.3% of the annual reserve

was used Wind is pressure due to the intensity of sunlight is the movement of the air mass as a result of its changes.

Economically, if the wind speed at the site is less than 5 m/s, it is advisable to use wind generators. The wind generators are 2-4 times more expensive than traditional generators.

But it is important in some regions where wind energy is constantly abundant are energy sources.

Most wind generators have a wind speed of more than 3-4 m/s works using Wind generators blow at a speed of 8-25 m/s will have maximum power with the help of wind. Usually, the wind The maximum operating speed of generators is 25-30 m/s.

Wind energy is an environmentally friendly source of energy. But very large areas are required for wind power plants (wind location of energy devices far from each other and between them the distance should be equal to 6-18 times the diameter of the working wheel). For example, a wind turbine with an impeller Z)=100m

5-7 km^2 area is needed for For a full head wind farm and tens of km^2 area is needed. Another disadvantage is the working wheel as a result of making noise and vibrating the air, TV and radio broadcasts are interfered with. Germany is the first in the use of wind energy is occupying the place. This country produces wind energy output is increasing by 500-1500 MW per year, currently in production the amount of released energy is 2 min. exceeded kW/h.

Wind generators - the kinetic energy of the wind into electricity energy converting device. Wind generators There are two types: industrial and home. Industry wind generators for the state or large energy corporations is built by The energy of these devices is collected in one place and resulting in wind power plants. Its main difference - no raw materials required for operation and no waste does not come out. One of its main requirements is the annual average wind speed is a high color. Fire extinguishing in every industrial power plant system that provides information about the operation of the wind generator there is a telecommunication system and a lightning protection system. The capacity of modern wind generators is up to 6MW (6000 kW). enough.

Types of wind generator. Two principles of wind turbinestype available: vertical and horizontal axis of rotation. Vertical axis turbines they work in low-speed winds, so they are less efficient is considered Therefore, vertical axis turbines are rarely used. Mostly they are installed for home. Building wind for the house the development of devices is developing rapidly. Usually, 9 m/s about 1 kW of electricity for a small house can be obtained from wind energy blowing at high speed. Currently, 1-3 kW-hour wind turbines are installed and used in the regions of our country by Dialog LLC.

Amount and price of energy produced. USA wind in 2006 in America, according to the information of the Energy Association 17,543 kW of electricity was produced, with a total cost of 56,082,850 per dollar, the price of 1 kW of electricity was equal to 3200 dollars. This year, 19,483 kW were generated by wind power plants around the world electricity is produced. Wind in the US by 2020 electricity produced by power plants the amount is planned to reach 50,000 MW. This is the amount it is 3% of the electricity produced in the country just does.

Nowadays, it is environmentally friendly in all countries of the world efforts are being made to use solar energy, which is considered energy. Produced from solar energy, heat and electricityis used in the output. In the first case, flat concentrated solar collectors is used, in the second case, the energy of the light flux is directly converted into electrical energy using photoelectric generators (or traditional heat and electricity from heat energy obtained from sunlight used as in stations). Low-temperature (up to 100°C) heat from solar energy with the help of currently developed technologies It is not very complicated and it is a long time at different points of the earth's surface has a history of development.

The amount of energy transmitted by the wind energy device is the air flow is fundamentally different from the amount of energy it produces. Because the air part of the flow energy is in the blades of the wind wheel, reducer and generators are wasted. The amount of wasted energy is wind is taken into account with the coefficient of energy use.

The technology of the 20th century opened completely new possibilities for wind energy, its task was different - to generate electricity. At the beginning of the century, N. E. Zhukovsky developed the theory of the wind turbine, on the basis of which it was possible to create highly efficient devices capable of extracting energy from the weakest breeze. Many projects of wind turbines have appeared, which are much more advanced than the old windmills.

Strong wind turbines are usually located in areas where constant winds blow (on seashores, shallow coastal areas, etc.). Such turbines have already been used in Russia, USA, Canada, France and other countries.

The high cost of wind power units still hinders their widespread use under normal conditions. It's hard to say that there's no need to pay for wind, but the machines needed to run it are very expensive.

As the number of minerals decreased, people turned to other types of energy sources. Despite their high efficiency, nuclear power plants continue to scare people with their pollution. Chernobyl and Fukushima are still on the lips. It is not surprising that humanity paid attention to natural energy sources - sun, wind, heat. Today, wind energy is developing rapidly. Today, wind energy provides electricity at the same cost as new conventional fuel plants. The capital costs of wind turbines are much higher

than conventional energy sources that use gas. At the same time, there are no fuel costs, and other normalized costs of this type of energy (works, maintenance cost) are ultimately competitive with other sources. Analysts concluded that wind power would reduce the overall market value of electricity. After all, in the last 30 years in Europe, the power of this type of turbines has increased almost 300 times, during this time the cost of production has decreased by 80%.

Wind energy is the extraction of mechanical energy from the wind and its subsequent conversion into electrical energy. Wind energy can be successfully used when the wind speed is 5 m/sec or more. The disadvantage is that it makes a lot of noise.

A wind power plant is a station consisting of several devices that convert the kinetic energy of the wind flow into electrical energy. The wind power plant is often used as a source of electricity in regions with high average annual wind speed (greater than 5m/sec) and remote areas from centralized power supply networks. The wind power plant can generate electricity from 8 kW to 1.2 mW. The use of wind energy is currently a rapidly growing branch of world energy. For example, in 2000, the total capacity of wind power plants in the world was 17.8, and in 2022 it reached 900 GWT.

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