

THE LATEST TECHNOLOGIES IN THE FIELD OF ELECTRICITY

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Анотація:

У статті розглядаються новітні технології в галузі електроенергетики, завдяки яким зменшується споживання електроенергії без втрати продуктивності та зменшуються шкідливі викиди в навколишнє середовище.

Ключові слова: ноу-хау, новітні технології, електроенергетика, продуктивність, енергоефективність, навколишнє середовище.

Abstract:

The article examines the latest technologies in the field of electric power, thanks to which electricity consumption is reduced without loss of productivity and harmful emissions into the environment are reduced.

Keywords: know-how, latest technologies, power engineering, productivity, energy efficiency, environment.

Introduction

The modern world runs on electricity. Without it, life for people would be completely different. The demand for energy, particularly in electrical forms, is ever-increasing in order to improve the standard of living. Power electronics helps with the efficient use of electricity, thereby reducing power consumption. Therefore, this industry is one of the leading industries in the world. Looking at all electrical inventions, there is a stereotype that it is impossible to invent anything new in this field, but modern global trends in the development of the energy sector break it.

The importance of electricity in the modern world

Electrical know-how is a key aspect of modern technological development. It includes various aspects, such as the development of new technologies for the generation and transmission of electricity, the improvement of electrical devices and energy process control systems, as well as the application of modern methods and materials to improve the performance and efficiency of electrical systems.

Due to the constant increase in energy prices, everyone is trying to choose the most optimal type of electricity for themselves. Therefore, one of the main directions of the development of know-how in electricity is the introduction of energy-efficient technologies. This means designing and implementing systems that allow you to reduce power consumption without losing productivity. New materials and designs used in electrical engineering allow for the creation of more compact and efficient devices, which contributes to improving the quality of life and reducing the negative impact on the environment.

In addition, the development of electrical know-how contributes to the emergence of new opportunities in the fields of automation and robotics. The introduction of modern technologies in these fields allows the creation of intelligent control systems that provide automated control and optimization of the operation of electrical devices and systems.

History of electricity in general

In 1878, Thomas A. Edison began work on the electric light and formulated the concept of a centrally located power station with distributed lighting serving a surrounding area. He perfected his light by October 1879, and the opening of his historic Pearl Street Station in New York City on September 4, 1882, marked the beginning of the electric utility industry.

The growth of ac systems, further encouraged in 1888 when Nikola Tesla presented a paper at a meeting of the American Institute of Electrical Engineers describing two-phase induction and synchronous motors, made evident the advantages of polyphase versus single-phase systems.

The first electronics revolution began in 1948 with the invention of the silicon transistor at Bell Telephone Laboratories by Bardeen, Brattain, and Shockley. Most of today's advanced electronic technologies are traceable to that invention, and modern microelectronics has evolved over the years from these silicon semiconductors.

Here are some examples of the latest technologies in energy:

1. Renewable energy: Solar panels, wind turbines, hydroelectric plants and other renewable energy sources are becoming more common and competitive.
2. Energy storage: Energy storage technologies such as batteries, thermal storage and gas storage systems allow efficient use of the energy produced.
3. Smart power grid management systems: digital technologies and artificial intelligence help to optimize energy distribution and ensure the stable operation of grids.
4. Energy efficiency of buildings: the use of insulated materials, efficient heating and air conditioning systems allows to reduce energy consumption in buildings.
5. Electric mobility: the development of electric vehicles and infrastructure for their charging contributes to the reduction of emissions of harmful substances into the air.

The examples of modern inventions in the field of electricity are given:

1. "Wind trains" in the Netherlands

Since January 2017, the railway of the Netherlands has completely switched to alternative energy sources, namely the use of wind energy. This happened a year earlier than planned: in the strategy of the transition of the railway to renewable energy supply, the deadline was set in 2018. "Wind trains" can move at a speed of up to 200 km per hour. Every day, 5,500 trains run on the tracks of the Netherlands, the services of which are used by more than 600,000 passengers.

2. Home wind farm from Aeromine

Aeromine has created a wind energy system for large flat roofs consisting of bladeless units that are positioned along the edge of the building in the direction of prevailing winds to generate electricity.

This technology is not yet available for commercial use, although the company claims that one of their systems can generate up to 50% more energy than a rooftop solar panel.

3. Triton wave energy generator from Oscilla Power

The potential of marine energy, also known as hydrokinetic energy, is enormous. Oscilla Power's Triton wave energy converter has the unique ability to generate energy from all ocean motions.

The Triton is a high-performance multi-mode point shock absorber consisting of a geometrically optimized surface float connected to an annular vertically asymmetric support plate by three tensioned flexible links. Triton has a unique ability to generate power from all ocean motions, including heave, pitch, wave, roll and yaw. If you connect several generators, you can create a marine power system.

The system is powerful enough to withstand an 18-meter wave and can produce about the same kilowatts as an onshore wind turbine.

4. Nant de Drance hydroelectric power station, Switzerland

After 14 years of construction, including the laying of 17 km of underground tunnels, the Nant de Drance hydroelectric power plant became operational in July, aiming to stabilize Europe's electricity supply while supporting the transition to renewable energy sources. Surplus electricity, including solar and wind, can be "stored" in the power plant's two reservoirs; water moves between them through a steel pipe taller than the Eiffel Tower, driving six turbines some 600m underground.

The largest hydro-accumulating power plant in Europe can store up to 20 million kilowatt-hours, which corresponds to the capacity of 400,000 car batteries.

These are just a few examples of the latest technologies in energy, which are aimed at creating more sustainable, clean and efficient energy supply systems.

Conclusion

Electricity plays an extremely important role in the modern world. It is the basis for many technologies that we use every day, such as lighting, heating, air conditioning, computers, telephones, electronics, transportation and much more.

Electricity is also a key factor in efforts to reduce humanity's impact on the environment, as it allows the use of alternative energy sources such as solar and wind power.

Therefore, electricity plays an important role in all spheres of our life and without it the modern world would be impossible.

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