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The History of the Development of Energy

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Since ancient times, energy has played an important role in human life and the development of civilization. The people's need for energy is a necessity for survival, therefore, the production and consumption of energy are one of the most important areas of human activity. Energy is the key to the development of civilization, as the evolution of human society depends on the conversion of energy for human use. The development of energy begins from the time when a person took possession of fire, the energy of rivers, wind, and continues to this day.

Energy is divided by type of energy into electricity, heat, hydropower, wind, nuclear, etc.

All the most important technical achievements are associated with the discovery and use of fire - from ancient metallurgy and ceramics, from steam engines to electric, heat and nuclear power. Having mastered the fire, the man continued to search for energy sources in the world around him. And man turned to the energy of flowing water and wind.

Age of water

A real breakthrough occurred at the moment when a person learned to use the energy obtained by moving water. The main invention of that time was a vertical wheel. It was installed near the river, which allowed to actuate, for example, millstones of mills. Later, the same technology for generating energy began to be used in other fields of activity, such as leather dressing, iron forging, woodworking, and other. As a

result, labor productivity has significantly increased, the person's dependence on the strength of his muscles and the strength of domestic animals has decreased. Places with good water and energy resources have become centers of economic and industrial activity.

Age of steam engines

The modern age began in the eighteenth century with the introduction of steam energy in the English coal mines of Thomas Severy and Thomas Newcomen. Their steam engines and the James Watt engine displaced geographically dependent water installations. Relationships in the areas of coal mining, the iron industry, and steam power plants have led to advances in steam technology, and since the 1800s, steam engines have supplemented water wheels in English textile mills. The main advantage of the new engines was their complete independence from the geographical location of the enterprise in which they were used. In addition, the operation of steam plants was not affected by weather conditions, such as calm, drought, freezing rivers or floods.

Despite its obvious advantages, steam engines were still used for about a hundred years only together with watercraft. Another leap occurred around the mid-nineteenth century, when Philadelphia inventor Oliver Evans introduced a new high-pressure steam engine. Gradually, his invention gained wide popularity and began to be used in rail transport and river vessels. This was the beginning of the transport revolution in the United States, and later throughout the world.

Age of electricity

The development of steam installations did not solve one of the main problems, namely the transport of energy over long distances.

The discovery of such a phenomenon as electromagnetic induction radically changed the situation. After that, it became possible to transmit energy over long distances using copper

wires. The development of electricity not only changed the appearance and nature of the work of factories in the early twentieth century, but also affected the transport infrastructure, the wagons were replaced by trolley buses, etc. Electricity also replaced gas for outdoor lighting, kerosene for home lighting, firewood and coal in stoves and heaters.

The main role in the development of electricity was naturally played by Thomas Edison. The incandescent lamp he invented made a real industrial revolution. And his Manhattan power station became the standard of such enterprises for many years to come. Nicola Tesla, inventor of the alternator, and Frank Sparga, who launched the first commercially successful electric tram in Richmond in 1887, also made a huge contribution to the development of electricity.

Unfortunately, the Edison system did not solve the problem of the transporting of electricity over long distances, because it is based on direct current. Therefore, the competition of Edison's company was Westinghouse's company, which used alternating current. One of the most famous projects of this company was the installation of a generating station at Niagara Falls. It was Westinghouse that was the first to deliver electricity from generating facilities in California to such remote cities as Los Angeles and San Francisco.

Atom age

By the 1960s, humanity was faced with a number of serious problems. Firstly, the places for the construction of hydroelectric power plants became less and less. Secondly, the active use of non-renewable natural resources, such as oil and coal, has caused a sharp deterioration in the environmental situation on the planet. All of the factors described were the causes of the gradual development of nuclear energy [1].

Research in this field began from the nineteenth century with a series of successful studies of the properties of uranium

by Maria Sklodovskaya-Curie. It was her work that served as the starting point for the further study of the atom and its structure. By the early 1940s, leading European and American physicists noticed that the fission of the uranium atom leads to a chain reaction and the release of a huge amount of energy.

The indicated process had enormous potential, both in the peaceful and in the military fields. That is why scientists at Columbia University, led by Albert Einstein and Enrico Fermi, were able to obtain permission for research, as well as funding from the US government. Already in 1942, scientists from the so-called “Manhattan project” managed to get the first controlled nuclear reaction [2].

Nuclear energy is still considered by many people as one of the best solutions to meet human energy needs. The use of other resources, such as energy from the sun, wind and biomass, also looks quite promising.

References:

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2. John J. Berger. The Development of Energy [Electronic resource]. – Mode of access: <http://www.scienceclarified.com/scitech/Energy/Alternatives/The-Development-of-Energy.html>. – Date of access: 27.04.2020.