

THE CHANGING WORLD OF POWER GENERATION AND CONSUMPTION

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Energy affects all aspects of human life. It can't be overestimated. Energy is needed to power equipment, domestic appliances, manufacturing and many other. During the last hundred- and fifty-years power generation has started to develop extremely fast, although first attempts of using energy were made almost one and a half millenniums ago. Firstly, it was windmills and watermills. Then steam engine was invented. It caused the Industrial Revolution: human work was replaced by machines greatly. The discovery of electromagnetic induction by Michael Faraday in 1831 laid the foundation for the creation of generators and transformers which allowed the conversion of mechanical energy into electrical energy. In the early 19th century coal along with oil became the primary energy source used for steam engines and power plants.

In 1942 the group of scientists led by Enrico Fermi created the world's first nuclear reactor, opening new opportunities for power generation. Since the second half of the 20th century nuclear power plants have gained widespread popularity, and even now the importance of NPPs is growing quickly. It's all because of their total safety for the environment. According to the World Nuclear Association, in 2023 nuclear generators created a total of 2602 billion watt-hours of electricity. For instance, in 1977 it was nearly 500 billion watt-hours of electricity. Today in the developed countries decarbonization is becoming more popular. The reduction of coal usage in the energy sector is achieved not only through nuclear power plants but also through renewable energy sources. It is solar energy that is gained by solar panels, hydropower that is generated at hydroelectric power stations, wind energy

with turbines. According to the International Energy Agency the share of renewable energy sources in global electricity generation accounts for 29%.

Looking ahead, the energy sector is predicted to undergo profound changes. The International Energy Agency says that renewable energy sources could supply over 50 % of global electricity by 2030. The Paris Agreement limits greenhouse gas emissions by urging countries to take action in the fight against climate change and supporting commitments to achieve a better climate situation.

The industrial sector is the largest energy consumer, using about 54% of global consumption. The transport sector is the second consumer, using nearly 30% of total energy. The services sector and householding represent the remaining energy used.

References:

1. The information about safety of nuclear power plants was received from <https://www.iaea.org/ru/temy/bezopasnost-atomnyh-elektrostanciy>
2. The information about power generation through renewable energy sources was received from <https://www.iea.org/reports/global-energy-review-2021/renewables>