THE CURRENT STATE OF WORLD ENERGY IN THE FIRST HALF OF THE 21ST CENTURY AND THEIR PROSPECTS

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Abstract: This article analyzes the current state of the world energy industry in the first half of the 21st century, the main problems and promising directions of development. Global changes in the energy market, the increasing importance of renewable energy sources and the acceleration of decarbonization processes are detailed. Strategies for international cooperation, technological innovation, and energy security are explored. Regional differences in energy consumption and production, climate change and environmental sustainability are also considered. The results of the research serve as an important guide in ensuring the sustainable development of the global energy system in the future.

Keywords: World energy, 21st century energy, Renewable energy sources, Energy resources, Decarbonization, Energy security, Global energy markets, Energy efficiency, Climate change, Sustainable development, Innovative technologies, Energy consumption, Energy infrastructure, Regional energy systems, Environmental sustainability

When talking about the current state and prospects of world energy in the first half of the 21st century, it is necessary to pay attention to the following main situations:

Current state of world energy (as of the early 2020s)

The current state of the world's energy depends on various trends, technological advances and socio-political changes. The main sources of energy are still composed of conventional (oil, gas, coal) and renewable (solar, wind, hydropower) types of energy, but the demand for renewable energy has increased in recent years.

Traditional energy sources

Oil: Still accounts for the largest share of world energy. Oil prices and production processes have a major impact on the global economy.

Natural gas: Second only to oil. Production and consumption of natural gas has increased because it produces less carbon emissions and is emerging as a clean energy source.

Coal: Coal consumption remains high in some regions (particularly China and India), but is being phased out to combat negative environmental impacts and global climate change. is being implemented.

Renewable energy sources

Solar Energy: The solar energy industry has grown significantly in the 2020s. Solar panels have been seen as the fastest growing sector of renewable energy, including falling costs and increasing efficiency.

Wind Energy: Wind energy has also grown significantly, especially in Europe and North America. Large wind turbines and large wind farms continue to be built.

Hydropower: Still one of the largest sources of renewable energy, but the construction of new hydroelectric plants is associated with environmental and social problems.

Geothermal energy and bioenergy: Geothermal energy is successfully developed in some regions, and bioenergy is used effectively in agriculture and waste treatment.

Key Trends in the Energy Industry

Decarbonization and green energy transition: As many countries implement policies aimed at reducing carbon emissions in order to mitigate climate change, the energy sector is increasingly focusing on renewable energy sources. Countries that have joined the Paris Agreement are developing strategies aimed at reducing their carbon footprint and increasing energy efficiency.

Technological Updates: Advances in artificial intelligence, IoT (Internet of Things), smart grids, and storage technologies are fueling innovation in the energy sector. For example, the technology of batteries (li-ion batteries) is helping to develop storage systems.

Electric Vehicles: The electric vehicle (EV) industry is growing rapidly. This is changing not only the automotive industry, but also energy systems, as the demand for electricity increases.

Energy Outlook (2025-2050)

The outlook for energy depends on a variety of factors, including technological advances, economic policies, the fight against climate change, and resource scarcity. Here are some promising directions:

Transition to green energy

The transition to green energy will continue. The share of solar and wind energy is growing, replacing coal and other traditional fuels. Technologies aimed at increasing energy efficiency and reducing emissions are becoming widespread.

Atomic energy

Nuclear energy is being rethought as "green" energy because it is much cleaner than coal. However, nuclear waste and safety issues are still pressing issues.

Hydrogen energy

Hydrogen energy may be important as an energy source in the future, especially with the development of green hydrogen production technologies. Hydrogen can be used for transportation and industrial sectors.

Global energy changes and geopolitical implications

Global energy creates competition between countries and the need to strengthen energy security. The development of new technologies and increased demand for renewable energy will shape energy markets, particularly in developing countries.

Efficient storage systems

If renewable energy sources (such as solar and wind) become the main energy sources, this will create a need for efficient energy storage. New battery technologies and storage systems (for example, hydroelectric storage, electrotechnical storage) play an important role in this matter.

Summary:

In the first half of the 21st century, the world's energy system is expected to become a system based on the combination of traditional and renewable energy sources. Increasing energy efficiency, reducing carbon emissions, developing technologies and implementing global climate policies will determine the future of the energy sector. The development of green energy, hydrogen and storage technologies will help make the energy sector more sustainable and environmentally friendly.

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