Evolution and Trends in New Energy Technology Development

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Abstract. Renewable energy is of great significance in mitigating the negative impacts of traditional energy sources on the environment and easing energy tension. The purpose of this paper is to explore the development prospects of new energy sources and their impact on the earth's ecology. This paper concludes that in the global energy consumption structure, fossil energy accounts for up to 80%, while new energy accounts for only 10%. This indicates that new energy still has much room for development. Secondly, the efficiency of new energy technologies is generally higher than that of traditional energy sources. New energy technologies can generate more energy in a shorter period, thus reducing dependence on the Earth's resources. In addition, new energy technologies help reduce greenhouse gas emissions and have a relatively small impact on the earth's ecology. Overall, the research, development, and application of new energy technologies are of great significance in addressing the global energy crisis, protecting the Earth's ecology, and promoting sustainable development.

Keywords: New energy, technological development, human life.

1. Introduction

Increasing human activities, especially industrialization and urbanization, have led to climate change, air pollution, water scarcity, and soil pollution. In addition, with population growth and economic development, the energy demand continues to increase. However, traditional energy resources are dominated by the burning of fossil fuels, which release large amounts of carbon dioxide and other greenhouse gases, leading to global warming and climate change. At the same time, the process of mining and extraction of traditional energy resources destroys land, water and ecosystems, leading to loss of biodiversity and environmental damage. The supply of uniform energy resources is gradually decreasing, which leads to the problem of energy shortage. Energy shortages also lead to environmental damage, economic problems and increased social unrest. Therefore, people must turn to renewable energy sources and energy efficiency development to mitigate the negative impacts of traditional energy sources on the environment, as well as to alleviate the problem of energy tension.

Through the development of new energy sources, the transformation and upgrading of the energy structure can be realized, laying the foundation for the sustainable development of human society. This move will help to reduce dependence on traditional energy sources, especially oil, coal and other traditional resources. The extraction and utilization of these traditional energy resources not only face the problem of resource depletion but also produce a large number of pollutants, such as sulfur oxides, nitrogen oxides and particulate matter. In addition, the development and utilization of new energy sources help to protect the ecosystem. Traditional energy development is often accompanied by the destruction of land, water resources and ecosystems. In contrast, the construction of new energy projects such as wind and solar power generation facilities has a low environmental impact and is often chosen to be built on wasteland or in undeveloped areas, avoiding conflicts with human settlements. This low environmental impact makes new energy an important option for sustainable development.

Overall, the development of new energy can reduce dependence on traditional energy sources, reduce pollutant emissions, improve people's quality of life, promote economic development and create more employment opportunities, and at the same time promote the change and enhancement of the global governance system. Therefore, this paper aims to summarize the current situation of

new energy development. The research in this paper can contribute to promoting the transformation of energy structure and achieving sustainable development, and to the progress of human civilization.

2. Implications and Challenges of New Energy Development

The development of new energy sources is of great significance to the protection of the Earth's environment. With the depletion of traditional energy sources, the research and application of new energy technologies have become a common goal on a global scale. At present, new energy sources such as solar energy, wind energy, biomass energy and geothermal energy are widely used worldwide. The development of these new energy sources can not only reduce greenhouse gas emissions, minimize air pollution, and protect the ecosystem, but also improve energy security and provide a guarantee for economic development [1].

New energy development is of great significance for guaranteeing national energy security, protecting the environment, promoting economic development and technological progress, and promoting changes in the global governance system. Firstly, the development of new energy can reduce dependence on traditional energy sources, lower dependence on imports of oil, coal and other resources, and improve energy security. Secondly, the development of new energy can improve the quality of the environment, reduce air, water and other environmental pollution, and improve people's quality of life. In addition, the development of a new energy industry can also drive the development of related industrial chains, promote economic development and create more employment opportunities. Finally, the development of new energy can also promote the change and enhancement of the global governance system, promote international cooperation and exchanges, and jointly respond to global environmental problems and energy crises.

Globally, the development of new energy has attracted widespread attention and importance. However, the development of new energy also faces several challenges and problems. First, the high cost of new energy technologies is an important issue. Due to R&D costs, equipment costs, maintenance costs and other reasons, new energy technologies are difficult to be widely used in some regions and economically underdeveloped areas. Therefore, how to further reduce the cost of new energy technology is one of the key issues in promoting the development of new energy. Secondly, the development of a new energy industry requires policy support. Since the research and development, equipment manufacturing and project construction of new energy technologies require a large amount of financial support, they require support from the government and social capital. In addition, since the output power of new energy is greatly affected by weather and other factors, how to achieve stable grid connection and storage of new energy is another important issue facing the development of new energy. To promote the development of new energy sources, a series of strategies and recommendations are needed. First of all, the government should increase its support for the new energy industry and encourage and support the development of the new energy industry through policy support, capital investment, tax incentives, etc. Secondly, it is necessary to strengthen new energy technology research and development and innovation, improve technology and reduce costs. It is necessary to strengthen the research and development of new energy grid connections and storage technology to improve the stability and reliability of new energy. At the same time, it is also necessary to strengthen international cooperation and exchanges to jointly promote the development and application of new energy technologies. In short, the development of new energy faces several challenges and problems, which require joint efforts by the government and all sectors of society to solve. Only by strengthening policy support, increasing investment, promoting technological research and innovation, and strengthening international cooperation and exchanges can we promote the rapid development and application of new energy and achieve the goals of sustainable energy development and environmental protection.

3. Status of New Energy Development

3.1. Current Status of New Energy Applications

The advantages of new energy sources lie in their environmental friendliness, renewability, high energy efficiency, flexibility, economic efficiency, and energy security, which are conducive to sustainable development. At present, several countries have begun to utilize new energy technologies to replace traditional energy sources. China, the United States, Germany and other countries have begun to implement new energy technologies. Germany is one of the most active countries in the world in the field of renewable energy. The German government promotes new energy technologies and many residents have installed solar panels on their houses. For example, in the German state of Bayern, there is a solar power station called "Garching" with an installed capacity of 10 megawatts. China has made great strides in the utilization of solar energy. The largest solar power plant in China is located in Qinghai Province, with an installed capacity of 50 MW. In addition, China has many rooftop and ground-mounted solar panels that provide power for homes and industries. In California, USA, there is a solar power plant called "Sunny Valley" with an installed capacity of 100 MW. The plant utilizes large solar panels to convert solar energy into electricity, providing renewable energy for residents. Spain is rich in solar energy resources, solar power generation potential is huge. The Andalusian region of Spain has many large solar power plants, some of which have an installed capacity of hundreds of megawatts.

3.2. Recommendations for the Development of New Energy

To foster the new energy industry, the government should bolster support with financial subsidies and tax incentives. In 2022, China's renewable energy subsidies reached 77 billion yuan, driving its growth. Moreover, investing in R&D for technology advancement and cost reduction is crucial. Globally, renewable energy investments hit a record 364 billion in 2021, with China accounting for 3050 billion in 2022, growing 80% YOY, with a significant surge in the European market, indicating broad prospects. Lastly, publicity and education on new energy knowledge should be strengthened to improve public awareness and acceptance of new energy. According to the China Association of Automobile Manufacturers (CAAM), in the first half of 2023, China's new energy vehicle sales reached 2.6 million units, up 115% year-on-year, with a market share of 25%. This indicates that more and more consumers are beginning to accept and purchase new energy vehicles [2].

In summary, New energy needs the joint efforts of the government, enterprises, research institutions, and all sectors of society to develop new energy and apply it in practice. Through policy support, technological innovation, industry chain synergistic development, publicity and education, and other aspects of measures and cooperation, the widespread application and development of new energy can be promoted.

3.3. Prospects

In today's international situation and the current state of the earth, the development of new energy has become an urgent need. The following shows the promising development of new energy sources based on statistical data :

First of all, with the continuous progress of photovoltaic technology, the cost of solar power is gradually reduced, becoming a competitive new energy. According to the International Energy Agency, the global installed solar power capacity continues to grow, reaching about 180 million kilowatts in 2021, and is expected to reach more than 400 million kilowatts by 2030. As the world's largest solar power market, China's installed photovoltaic (PV) power generation capacity and power generation capacity rank among the world's top, making an important contribution to the development of global solar power technology [3].

Secondly, wind energy is also a new energy with great potential. Wind power generation technology is mature, low-cost, and does not produce greenhouse gas emissions. According to the Global Wind Energy Council (GWEC), the global installed wind power capacity will reach 837

gigawatts (GW) in 2021, an increase of 11% year-on-year. Among them, China's installed wind power capacity reached 305 GW, ranking first in the world. With the advancement of technology and the expansion of application scope, wind power generation is expected to become an important mode of energy supply in the future.

In addition, nuclear energy, as a clean and efficient energy source, also has broad prospects for development. Nuclear power generation produces no greenhouse gas emissions and has low fuel costs. Although there are certain safety risks and nuclear waste disposal issues associated with nuclear energy, nuclear power generation is expected to play a more important role in the future as technology continues to advance and the scope of application continues to expand [4,5].

In summary, solar, wind and nuclear energy are new energy sources with broad development prospects. Through policy support, technological innovation and market-driven efforts, New energy resources can promote the widespread application of these new energies and make positive contributions to the construction of an ecological civilization and the sustainable development of the planet.

4. Conclusion

This paper discusses the classification and categorization of common new energy technologies, energy type options, and the cost of replacing traditional energy sources. Solar and wind energy are the main renewable energy sources. The integration of smart technologies with new energy sources has made energy management smarter and more efficient, and big data and IoT technologies can help predict energy demand and optimize energy scheduling. Hydrogen energy, as a clean and efficient form of energy, is receiving global attention, and many countries are actively promoting its research and application. Policies and market forces provide strong support for the development of new energy technologies. Governments around the world are promoting the research, development and application of new energy technologies through policies such as carbon tax and green certificates. Consumers' growing awareness of environmental protection and energy saving has led to the expansion of the new energy market. Global cooperation and exchanges on new energy technologies are also becoming more frequent, and countries are working together to achieve global energy structure transformation and carbon neutrality. Despite the challenges, these discoveries and breakthroughs strongly support sustainable development.

In the future, new energy sources can be explored more comprehensively by combining the research results of emerging science and technology to promote energy structure transition and sustainable development. Combining artificial intelligence and machine learning technologies can optimize energy management and improve energy use efficiency. Utilizing IoT and communication technologies, the interconnection of energy equipment can be realized, improving the efficiency of energy sharing and collaborative use. These new technologies will provide strong support for the realization of global energy structure transformation and carbon neutrality goals.

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