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How can the new energy economy achieve better development under the background of the digital economy

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Abstract

China needs to develop the digital economy, accelerate the promotion of artificial intelligence, and utilize digital technologies to speed up the upgrading of traditional industries. Meanwhile, it should also develop digital consumption and digital trade. As China's economy shifts from the real estate economy to the digital economy in the future, during the explosive growth of computing power, there will also be an explosive increase in the demand for energy. In terms of energy, it can support China's future development of the digital economy. In the past two years, we have witnessed the rapid development of China's new energy. In the short term, there may be a certain overcapacity. In the future, once the digital economy grows and prospers, there may be an energy shortage globally. China has unparalleled advantages both in terms of data and computing power. China's renewable energy accounts for 30% of the global production capacity. Therefore, the future application scenario of China's new energy is the digital economy. Overall, we are still very optimistic about the development prospects of China's new growth drivers during the transition between old and new growth engines.

Keywords : Clean energy; Digital economy; Industrial upgrading; Sustainable development

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Introduction

There is an inseparable relationship between the digital economy and the new energy economy. Centered around information technology, the digital economy drives industrial transformation and innovative development through digital, networked, and intelligent technologies, injecting new vitality into the development of the new energy economy. The digital economy has enhanced the intelligent level of the new energy industry, facilitating real-time monitoring, precise control, and intelligent dispatching of new energy products, improving the utilization efficiency and economic viability of new energy, and spurring technological innovation and breakthroughs in the new energy field. The impact of the digital economy on the new energy economy is manifested in multiple aspects. Firstly, the digital economy provides informational support for the new energy economy. The application of technologies such as big data analysis, artificial intelligence, and the Internet of Things makes the production process of new energy more intelligent and efficient. Through digital means, the production, storage, transportation, and consumption processes of new energy are optimized, reducing production costs, enhancing energy utilization efficiency, and accelerating the popularization and application of new energy technologies. Secondly, the digital economy promotes the diversified development of the new energy economy. The application of digital technologies makes it possible for the diversified utilization of new energy. For example, the digital economy has given birth to the concept of the energy Internet. Through the construction of smart grids and the application of energy Internet technologies, new energy can be better integrated into the energy system, forming complementarity and synergy with traditional energy, improving the overall energy

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utilization efficiency, and driving the optimization and diversification of the energy structure. In addition, the digital economy also provides new space for market expansion for new energy. With the support of the digital economy, new energy products are gradually moving towards high value-added and high-quality directions, opening up competitive space for the new energy industry in the energy market. Meanwhile, the digital economy also provides broader channels for the promotion and marketing of new energy products, facilitating the expansion and growth of the new energy market. In conclusion, the digital economy, with the support of information technology, diversified development, and market expansion, has greatly promoted the development, growth, and enhancement of the new energy economy, providing important support and guarantee for the better development of the new energy economy. Therefore, it is necessary to further deepen the integrated development of the digital economy and the new energy economy to promote the leapfrog development of the new energy economy and achieve the goal of sustainable development.

Literature Review

With the prominence of environmental issues and the limitations of traditional energy, the development of new energy has become a global focus. Currently, the new energy sector has entered a period of rapid growth. The utilization of clean energy such as solar energy and wind energy has been continuously expanding and has gradually become an important part of the energy field. Along with the global energy structure adjustment and continuous breakthroughs in new energy technologies, the proportion of new energy in the energy structure has been constantly increasing.

Domestically, the new energy industry in China has witnessed rapid development and has reached a large scale. In the field of solar energy, China has become the world's largest producer of photovoltaic modules. The cost of photovoltaic power generation has been continuously decreasing, and there are diverse "photovoltaic +" application models. Projects such as photovoltaic agriculture and photovoltaic poverty alleviation have promoted the integration of energy with other industries. In the wind energy sector, China is the world's largest wind power market. The manufacturing technology of wind turbines has witnessed continuous breakthroughs, and wind farms are scattered across the northwest, north China and coastal areas. Meanwhile, the new energy vehicle industry is booming, with its production and sales ranking first in the world. The construction of charging infrastructure is gradually being improved, and the level of battery technology has been enhanced, driving the coordinated development of upstream and downstream industries.

Internationally, Europe is at the forefront in the utilization of new energy, especially in the fields of wind energy and solar energy. Denmark is a model in wind energy utilization. The proportion of wind power generation in its total national electricity consumption is quite high, and its related technologies are mature. It has rich experience in the construction and operation of offshore wind farms. Germany has been vigorously promoting the development of solar energy. It encourages households and enterprises to install solar panels through policy subsidies. Its installed capacity of photovoltaic power generation ranks among the top in the world, and it has invested heavily in the research and development of energy storage technology to solve the intermittency problem of new energy. The United States has made many investments in the new energy field and has achieved results in the innovation of new energy vehicle battery technology and the development of bioenergy. Enterprises like Tesla are leading the global technological trend of new energy vehicles, and the production of biofuels such as bioethanol is considerable and widely applied.

However, both domestic and foreign new energy development face challenges. Domestically, issues such as technological costs and new energy consumption and absorption still need to be solved. In some regions, the phenomena of wind and solar energy curtailment exist. The adaptability between energy storage technology and new energy development is insufficient, and the peak shaving capacity of the power grid needs to be improved. Internationally, new energy policies are unstable due to the influence of political factors, and international trade disputes in the new energy industry are on the rise. In general, both opportunities and challenges exist in the

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development of new energy at home and abroad, and continuous technological innovation and policy optimization are required. Based on the analysis of the current situation of new energy development, we need to clearly understand the situation, identify problems and actively respond to promote the better development of the new energy economy.

Research Objectives

Technology and cost remain one of the key issues restricting the development of the new energy economy. Although clean energy technologies such as solar energy and wind energy have witnessed continuous breakthroughs, the technological costs are still relatively high, which restricts the competitiveness of new energy in the market. The problem of energy consumption and absorption has become a bottleneck restricting the development of new energy. The large-scale power generation and consumption absorption of clean energy have always been difficult problems plaguing the development of new energy. The problem of wind and solar energy curtailment caused by serious overcapacity not only leads to the waste of resources but also results in the waste of energy. The problem of energy waste urgently needs to be solved. This paper intends to study whether the problems of technology and cost can solve the difficult problem of energy consumption and absorption.

In addition, the energy storage problem of new energy is also a key obstacle restricting its development. An ideal energy storage technology has not yet been found, resulting in the instability and intermittency of new energy becoming a shortcoming restricting its application.

Although the new energy economy has achieved considerable development driven by the digital economy, it still faces some constraints and challenges. Factors such as technological costs, energy storage problems, energy consumption and absorption, and imperfect policies and market mechanisms have restricted the development of the new energy economy. Solving these key issues requires the joint efforts of the whole society and the entire industrial chain, as well as the active participation of the government, enterprises, scientific research institutions and consumers, so as to jointly promote the new energy economy to embark on the path of sustainable development, drive energy transformation and achieve a win-win situation for the economy, society and environment.

Application of Technological Progress such as the Digital Economy in Renewable Energy

Focus on Technological Dilemmas: Shortcomings in Energy Storage and Constraints on Photovoltaic Efficiency

On the one hand, the technological dilemmas are significant, and energy storage technology is still immature. Battery energy density is low, charge and discharge efficiency is low, and battery service life is short. This leads to difficulties in stable storage of electrical energy and an inability to flexibly respond to peak and valley changes in electricity consumption. In terms of conversion efficiency, the photoelectric conversion efficiency of photovoltaic cells is restricted by materials and processes and it is difficult to break through the bottleneck, which restricts the full utilization of solar energy.

On the other hand, there is a spatio-temporal mismatch between energy production and consumption. In the western regions, new energy is generated on a large scale, but the local consumption and absorption capacity is limited. In the eastern regions with higher energy demand, the production capacity of new energy is insufficient. Long-distance power transmission will cause a large amount of power loss. Coupled with the intermittent and fluctuating characteristics of wind power and photovoltaic power, the problem of consumption and absorption is further aggravated, and the phenomena of "wind curtailment" and "solar curtailment" occur from time to time.

Empowerment by Technology: Digital Technology Illuminates a New Chapter for Renewable Energy

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The technological progress of the digital economy and others has brought hope for breaking the deadlock. In the research and development stage, using big data and artificial intelligence technologies can accurately analyze the characteristics of battery materials, accelerate the research and development of high-performance energy storage materials, and improve energy storage technology. Meanwhile, using machine learning algorithms to optimize the production process parameters of photovoltaic cells is expected to improve the photoelectric conversion efficiency. For the consumption and absorption of renewable energy, the Internet of Things technology realizes real-time monitoring of all links in energy production, transmission and consumption. Combined with the precise regulation of the smart grid, electricity can be dynamically allocated according to electricity demand to smooth out peaks and valleys. Digital twin technology creates a virtual energy system, simulates the energy supply and demand situation under different scenarios, and plans consumption and absorption schemes in advance to ensure the efficient utilization of renewable energy and steadily promote energy transformation.

Development Strategies for the Future New Energy Economy

The Government Should Increase Support for the New Energy Field

The government should increase its investment and support for the new energy field, widely solicit excellent projects in new energy scientific and technological innovation, application demonstration and market-oriented operation, and provide corresponding financial support and policy incentives to encourage enterprises to increase their research and development efforts and accelerate the innovation and industrialization process of new energy technologies.

Strengthen International Cooperation and Exchange in New Energy Technologies

Strengthen international cooperation and exchange in new energy technologies, jointly research and develop new energy technology equipment, jointly build smart energy demonstration cities, share the best practices in new energy applications, strengthen international exchanges and cooperation in the new energy field, and promote the globalization of the new energy economy.

Establish and Improve the New Energy Policy System and Market Mechanism

Establish and improve the new energy policy system and market mechanism, gradually establish and improve the new energy industry policy system, and promote the market-oriented process of new energy development. In terms of market mechanism construction, the pace of energy market reform should be accelerated, the construction of a modern energy market system should be promoted, and multi-level and multi-type new energy markets should be established. Meanwhile, the construction of laws, regulations and standard systems for new energy development should also be promoted to create a fair competitive market environment.

Strengthen the Work on New Energy Technology Standards and Quality Certification

Strengthen the work on new energy technology standards and quality certification, accelerate the establishment and improvement of the standardization and certification systems for technologies and products such as smart grids and distributed energy, improve the technical quality level of new energy products, and ensure the healthy development of the new energy economy.

Focus on Talent Cultivation and Introduction in the New Energy Field

Focus on talent cultivation and introduction in the new energy field, increase the introduction and cultivation efforts for outstanding talents in the new energy field, encourage more talents to engage in the research and practice of the new energy field, and provide a solid talent guarantee for the development of the new energy economy.

Joint Efforts of the Government, Enterprises, Scientific Research Institutions and Market Entities

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With the rapid development of the digital economy, the new energy economy is facing new development opportunities and challenges. In order to better promote the sustainable development of the new energy economy, a series of effective development strategies are needed. The future development strategies for the new energy economy require the joint efforts of the government, enterprises, scientific research institutions and market entities to jointly promote the leapfrog development of the new energy economy, build a cleaner, safer and more sustainable energy system, and achieve the sustainable development goals for the economy, society and environment.

Conclusion

The digital economy, with the support of information technology, diversified development and market expansion, has greatly promoted the development, growth and enhancement of the new energy economy, providing important support and guarantee for the better development of the new energy economy. Therefore, it is necessary to further deepen the integrated development of the digital economy and the new energy economy, promote the leapfrog development of the new energy economy and achieve the goal of sustainable development.

Although the new energy economy has achieved considerable development driven by the digital economy, it still faces some constraints and challenges. Factors such as technological costs, energy storage problems, energy consumption and absorption, and imperfect policies and market mechanisms have restricted the development of the new energy economy. Solving these key issues requires the joint efforts of the whole society and the entire industrial chain, as well as the active participation of the government, enterprises, scientific research institutions and consumers, so as to jointly promote the new energy economy to embark on the path of sustainable development, drive energy transformation and achieve a win-win situation for the economy, society and environment.

Innovative technologies play a vital role in the new energy economy. The application of innovative technologies in the new energy economy not only improves the intelligent level of new energy but also expands the diversified utilization ways of the new energy industry. Meanwhile, it also provides new possibilities for the storage and utilization of new energy. With the continuous emergence and development of innovative technologies, it is believed that the new energy economy will embrace a more brilliant future.

With the rapid development of the digital economy, the new energy economy is facing new development opportunities and challenges. In order to better promote the sustainable development of the new energy economy, a series of effective development strategies are needed. The future development strategies for the new energy economy require the joint efforts of the government, enterprises, scientific research institutions and market entities to jointly promote the leapfrog development of the new energy economy, build a cleaner, safer and more sustainable energy system and achieve the goal of sustainable development for the economy, society and environment.

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We will carry this gratitude with us and continue to move forward bravely on the academic road, contributing our own strength to promoting the vigorous development of the energy economy in the digital age. On the path of academia, fortunately, we have received support from many people. We will remember every kindness, forge ahead bravely, and live up to everyone's expectations.

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