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The Development of Various Industries in the Context of Carbon Neutrality

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Abstract

In order to mitigate climate change, protect ecosystems and biodiversity, promote sustainable development, achieve economic stability and growth, and promote global cooperation and sustainable development, major industries around the world are undergoing significant changes in the context of carbon neutrality. Among them, there are significant changes in the renewable energy industry, electric vehicle industry, sustainable construction industry, agriculture and industrial sector. In these industries, most of them are trying to get closer to the goal of carbon neutrality through continuous technological innovation and changes in production and operation methods. These changes will bring new growth opportunities to the global economy, create more green jobs, and drive technological innovation and cross-industry cooperation. Achieving carbon neutrality requires a global effort to build a solid foundation for a more sustainable world through cooperation and innovation.

Keywords: Renewable energy industry; electric vehicle (EV) industry; sustainable construction industry; agriculture industry; industrial sector; a global effort.

1. Introduction

In recent years, carbon neutrality has attracted the attention of more and more countries, and many countries are taking many measures to achieve carbon neutrality. The concept of carbon neutrality is achieving a balance between the amount of greenhouse gases emitted into the atmosphere and the amount removed from it. It is an important concept in the context of climate change mitigation. More and more countries are paying more attention to environmental protection, and many have plans to become carbon neutral by 2050. Limiting global warming to 1.5°C would require humanity to significantly reduce carbon emissions by \$10 billion. This includes cutting emissions to at least 49% of 2017 levels by 2030 and achieving carbon neutrality by 2050.^[1] This paper will investigate and analyze the problems encountered by various industries in the context of carbon neutrality and make appropriate suggestions for the problems that arise. We mainly understand the basic situation of renewable energy industry, electric vehicle industry, sustainable construction industry, agriculture, industry and other industries.

2. Carbon emission status and technological innovation in various industries

2.1. Renewable energy industry

It is increasingly crucial to improve the sustainable use rate of energy and contribute to carbon neutrality and environmental footprint reduction.^[2] The current state of carbon emissions in the energy sector is a global concern. Traditional energy industries such as coal, oil and natural gas have become one of the major sources of carbon emissions due to greenhouse gas emissions such as carbon dioxide generated by their combustion processes. In order to address climate change and reduce carbon emissions, the energy industry has begun to actively carry out technological innovation. Here are some of the technological innovations currently driving carbon reduction in the energy industry: Production of new biofuel from waste cotton cellulose activated by phosphoric acid.^[3] A hybrid two-stage multi-objective optimization algorithm is used to minimize the transformation of heat exchanger network.^[4] And other technological innovation such as Renewable energy technologies and Energy storage technology.

These technological innovations are important for the sustainable development of the energy sector and the reduction of carbon emissions. However, technological innovation still faces some challenges, including economic costs, large-scale deployment and policy support, and global cooperation is needed to drive the transformation of the energy industry.

2.2. Electric vehicle (EV) industry

Electric vehicles have an advantage over traditional fuel vehicles as they do not produce exhaust emissions during their operation, making them a more environmentally friendly option to reduce carbon emissions and improve air quality. Moreover, many countries have introduced relevant policies to support the development of the electric vehicle industry. As a result, electric cars are more popular than ever. The promotion of electric vehicles and the reduction of greenhouse gas emissions provide important policy directions.^[5] The electric vehicle industry still has carbon emissions issues due to the manufacturing process and power source. The production of electric vehicles requires energy and emits carbon emissions through mining, processing, transportation, and assembly. Furthermore, the carbon emissions of electric vehicles are influenced by their power source, with higher emissions likely if the electricity comes from coal compared to conventional fuel cars. So there are a lot of companies that are working on solving the energy problem of electric vehicles.

2.3. Sustainable construction industry

The construction sector is one of the most important sources of greenhouse gas emissions worldwide, accounting for about 39% of total global emissions. The sustainable building industry is working to reduce carbon emissions and mitigate the effects of climate change. In the sustainable building industry, technological innovation plays a key role. The sustainable building industry uses a variety of low-carbon materials such as renewable, recycled and carbon-neutral materials. A collaborative research team from Sungkyunkwan University (SKKU) and the Korea Institute of Science and Technology (KIST) has made new achievements in the research of carbon-neutral advanced materials. Materials that can better convert solar energy into electricity and heat have been explored.^[6] There are also many technological innovations in the sustainable building industry, such as smart building management systems and smart grids with renewable energy.

2.4. Agriculture industry

Agriculture is one of the important sources of carbon emissions, the main carbon emissions from land use change, fertilizer use, agricultural machinery use, irrigation, animal husbandry and other processes. Because of its important contribution to carbon emissions, agriculture also has the opportunity to reduce its carbon emissions through

technological innovation. Some possible technological innovations to reduce carbon emissions from agriculture include precision fertilization, improved irrigation, and food processing and storage. Agricultural innovation will play an important role in the coming decades. Agricultural research and development must not only increase agricultural productivity amid the environmental challenges of drought and warming, but the technologies and practices that underpin agricultural production must reduce emissions in the coming decades. If the profitability of agriculture cannot be maintained, or emissions cannot be reduced, the cost of achieving carbon neutrality in agriculture in the region through reforestation will only increase.^[7]

2.5. Industry

Industry is one of the main sources of global greenhouse gas emissions, among which the energy sector, manufacturing and construction are the main sectors of carbon emissions. At present, global industrial carbon emissions continue to increase, causing serious impacts of global climate change. In order to meet the challenges of climate change, the industrial sector needs to carry out technological innovation and reduce carbon emissions. In industrial production, enterprises can improve in many aspects, such as improving energy efficiency, using clean energy, actively developing carbon storage technology, and improving production processes. Through technological innovation and the implementation of measures, the industrial sector can reduce carbon emissions and mitigate the impact of climate change.

3. Results and Discussion

Carbon emissions in the energy industry are still high, but with the advancement of clean energy technology and the implementation of policies, there is hope for reducing emissions and achieving carbon neutrality. The electric vehicle industry also faces emission challenges, but technological innovation can help in reducing emissions. By improving vehicle energy efficiency, promoting renewable energy, and exploring new energy technologies, electric vehicles can become more environmentally friendly. The sustainable building industry aims to reduce emissions through innovations such as low-carbon materials, improved energy efficiency, and integration of renewable energy. Similarly, agriculture can reduce emissions by promoting climate-smart practices and increasing mechanization. Governments and agricultural institutions can support this through technical assistance and incentives. Technological innovations in reducing industrial carbon emissions are key to achieving sustainable development. Collaboration between government, enterprises, and academia is needed to invest in these innovations and steer industries towards low-carbon practices.

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