

## Regional Green Technology Innovation, Environmental Regulation and Carbon Neutral Performance

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### Abstract

Nowadays, as our country's economy shifts from a stage of rapid growth to a stage of high-quality development, without a solid material foundation, it is impossible to carry out high-quality economic development and promote the harmonious coexistence of man and nature. Therefore, shifting from scientific and technological innovation to green technological innovation is an inevitable trend in my country's scientific and technological development. In order for our country to carry out regional green technology innovation while also implementing correct environmental regulations to reduce our country's carbon emissions and thereby promote our country's goal of achieving carbon neutrality in 2060, we have conducted corresponding research. This article uses innovation output, innovation effectiveness and innovation activity as indicators to organize data to study the degree of regional green technology innovation in China. It is concluded that in order to develop regional green technology innovation, it is still necessary to improve market vitality, brain drain, supporting mechanisms, etc. Make continuous improvements. This article conducts research on China's provincial panel from 2005 to 2015 and concludes that there are differences in the efficiency of environmental regulations on green innovation in different provinces. This article also compares the carbon dioxide emissions of various provinces. The research data shows that there are differences in carbon emissions in provinces with different development status of green technology. Therefore, there is a long way to go to promote the development of green technology innovation in different regions of our country.

### Keywords

Green Technology Innovation Capability; Environmental Regulation; Regional Differences.

### 1. Introduction

Innovation is the primary driving force. With global warming, countries around the world are paying more and more attention to high-quality development. With high-quality economic development but without a solid material foundation, it is impossible to comprehensively build a modern and powerful socialist country and promote green development. Therefore, green technological innovation requires the support of a solid material foundation. However, there are many problems in developing green technological innovation. For example, our country has a low level of green technology innovation, has not mastered core technologies, and has regional resource gaps. Therefore, we need to use government subsidies to promote enthusiasm for scientific and technological research and development, and use the digital economy to reduce regional resource differences. Environmental regulation has arisen due to extensive economic development since the reform and opening up. However, the existence of regional green technology innovation under environmental regulation will increase the cost of

enterprises in the short term and inhibit the enthusiasm of enterprises to develop regional green technology innovation. At the same time, various environmental regulations appearing in the market have brought certain obstacles to the development of regional green technology innovation by enterprises. Therefore, we need the government to clarify the environmental regulation plans of each province and provide corresponding subsidies to enterprises that develop regional innovation. Only in this way can we promote the development of green technology innovation in our country and achieve our country's 2060 carbon neutrality goal.

## 2. Current Status of Green Technology Innovation

The "double carbon" goal in 2021 was written into the government work report for the first time, and the "14th Five-Year Plan" listed green development as a special chapter for overall planning. China has attached unprecedented importance to green development. China is still among the developing countries, economic development still occupies the primary position, and science and technology is the main driving force of economic development. Therefore, if we want to develop the economy and science and technology while carrying out green development, we need to shift from science and technology development based on coal to science and technology based on the use of clean energy.

The development of green innovative technologies can improve the serious impact of extensive economic development on the environment since the reform and opening up. It can also bring corresponding core competitiveness to the development of enterprises and reduce the additional costs caused by pollution control. cost. However, the development of things must have two sides, and there are certain obstacles to the development of green innovative technologies. The main manifestation is that my country's scientific and technological maturity related to green development is low and it has not mastered key core technologies. And as Sino-US trade friction intensifies, external technological blockades against China make China's scientific and technological development more difficult. At the same time, due to differences in resources, policies, and geographical conditions across provinces in my country, the degree of regional green technology innovation is different. The regional innovation gap between urban and rural areas is gradually widening due to uneven resource distribution, continuous brain drain, and other issues. In terms of energy, management functions are scattered and the coordination mechanism is incomplete, resulting in various environmental regulations in the market and enterprises losing their development direction.

## 3. Environmental Regulation Issues

In the early days of the founding of New China, with the continuous development of my country's industry, environmental pollution problems continued to emerge, and environmental regulations also came into being. After entering the 21st century, with the continuous deepening of reform and opening up, my country's industrialization has continued to deepen, causing serious damage to the environment and making it increasingly difficult for the government to manage the environment. Nowadays, my country's environmental regulations will have a certain impact on enterprises. For example, it will cause enterprises to have a tendency to increase the cost of controlling pollution emissions to a certain extent. This will cause an increase in the costs of enterprises in all aspects, thus to a certain extent. Inhibiting regional green technology development. At the same time, environmental regulations will also reduce the production efficiency of enterprises, which is not conducive to the green transformation and long-term development of enterprises to a certain extent. Various environmental regulations have appeared in our country's market, but many companies have deviated from their starting points to a certain extent during actual implementation. At the same time, some companies equate "carbon reduction" with "production reduction." However,

research by many scholars has shown that environmental regulation will have a certain positive impact on corporate green innovation. For example, correct environmental regulation can reduce the cost of environmental pollution caused by corporate production in the long run and stimulate corporate production enthusiasm; it can also to a certain extent, it can reduce production costs for enterprises and enhance their competitiveness.

China is still the country with the largest population, and it still has a long way to go to realize its green development strategy. At the same time, China is also a developing country and still needs the support of economic development, but it cannot give up the goal of carbon neutrality in 2060 while developing its economy. By studying provincial panel data, it can be seen that under the constraints of China's resource supply, China's energy structure is dominated by fossil energy, resulting in the carbon emissions accompanying my country's economic growth only increasing rather than decreasing. Therefore, China has a long way to go to achieve its 2060 carbon neutrality goal.

#### 4. Solution Path

However, as the proposer of the global plan of a community with a shared future, China can be a pioneer in the face of the problem of high global carbon dioxide levels and take the lead in developing relevant green technology innovations to better control carbon emissions and contribute to the global response to climate warming. Provide a plan. High-quality economic development is the direction of economic development that adapts to the changes and development laws of China's modern society. Targeting high-quality economic development will help our country clarify development ideas, plan economic policies, and implement macro-control. High-quality economic development requires innovation in green technology, but innovation in green technology requires solid policy support. Therefore, we need to carry out corresponding environmental regulations based on the concepts of low carbon and environmental protection, and carry out economic development while ensuring low carbon, so that we can develop China's economy with the goal of high quality.

Technology is the primary productive force in social development. Faced with the influence of factors such as resources, policies, and geographical conditions in each province, we can promote regional collaborative innovation by encouraging the free flow of talents and efficiently allocating resources for free flow. We also need to conduct research based on regions to form green technologies with regional characteristics. Innovation model. In the face of unbalanced regional development, the provinces that take the lead in developing green technological innovation can radially drive the development of technological innovation in backward areas, thus benefiting areas with weaker technological capabilities to develop technological innovation.

In recent years, with the continuous development of science and technology, the digital economy has emerged. The development of green technology innovation in China has certain differences in development efficiency due to differences in resources, policies and geographical conditions in various provinces. We can use the digital economy to break the characteristics of time and space, contribute the resources owned by each province, reduce the problems of different levels of development caused by resource differences, and promote the common development of green technology innovation in each province.

Environmental regulation is the regulation of various behaviors that pollute the public environment with the purpose of protecting the environment. As an important means to manage environmental issues, environmental regulation will continue to have an important impact on the business development of various enterprises and departments in the economy and society. In order to implement the green development concept in the new development concept proposed by General Secretary Xi Jinping while promoting scientific and technological

innovation, we should carry out correct environmental regulations. Our country can standardize environmental regulations by formulating relevant legal provisions. The government should guide enterprises to independently and rationally carry out low-carbon transformation, and strengthen support for environmental regulations to a certain extent. The government can also guide the people to engage in green consumption and travel through environmental regulations, and guide enterprises to establish correct low-carbon environmental protection concepts, thereby establishing correct production methods and marketing methods. Relevant departments can provide financial assistance to enterprises that carry out green technology innovation and development to reduce the impact of corporate capital shortages on the development of enterprises.

At the same time, we should speed up the improvement of our country's energy innovation system and continue to promote the construction of our country's primary energy national laboratory; we need to continue to promote improved energy utilization technology; we also need to establish a complete national resource library to integrate the energy resources of each province. The combination of systems will help our country regulate resources, improve the overall utilization rate of resources, and establish an energy system suitable for the current national production environment, so as to better achieve high-quality economic development and achieve the goal of carbon neutrality. Our country can adjust the energy structure, adjust the proportion of clean energy and fossil fuels, continuously improve primary energy refining technology, and reduce the cost of using clean energy; upgrade machines that need to use fossil fuels to use primary energy through continuous research machines that will help achieve our country's carbon neutral performance and continue to reduce it. The continuous decline in carbon neutrality performance is not only conducive to the high-quality development of our country's economy, but also provides a development direction for countries around the world, especially developing countries.

Green technology innovation is an opportunity for China, and to a certain extent, it is also a huge challenge. For enterprises, especially small and medium-sized enterprises, they will inevitably encounter huge challenges in terms of funding. At this time, the government needs to provide corresponding support to small and medium-sized enterprises. This will help mobilize the enthusiasm of enterprises for low carbon, and thus better promote our country's regional green technology innovation and development. While government support is conducive to China's regional green technology innovation, the government needs to make correct regulations on the environment to achieve China's 2060 carbon neutrality goal. The country can increase research on carbon-neutral technologies in areas with rapid technological development, promote in-depth cooperation between schools and enterprises, and jointly develop low-carbon innovative technologies, which will help promote the development of regional green innovative technologies and solve the inefficiency of the transformation of school-enterprise results. high question. The government should scientifically grasp the direction and progress of environmental regulation, so that it can better implement environmental regulation correctly and develop regional innovative technologies that are suitable for our country and combined with the actual conditions of various places, so that our country can better realize 2060 . annual carbon neutrality target. In recent years, our country has also paid more and more attention to high-quality economic development and environmental regulation based on the concept of green development. In the short term, the development of regional green technology innovation will reduce the enthusiasm of Chinese enterprises for development, but from a long-term perspective, The government needs to correctly guide the development direction of enterprises, and provide certain preferential policies and subsidies to enterprises that develop low-carbon technology based on regional standards to stimulate the enthusiasm of enterprises. If this plan continues, China's economic development will shift to high-quality economic development,

promote the development of regional green technology innovation in China to a certain extent, and achieve the goal of carbon neutrality in 2060 is just around the corner.

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