

# Research on Green Technology Innovation and High-quality Development of Enterprises with Government Support

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## Abstract

**Green technology is a contemporary new technology application management system that matches ecological environmental protection, and is an independent innovation of technical products and management models. At present, the green transformation and high-quality development of enterprises are highly valued by the national government. The government provides assistance to enterprises from various aspects such as cash, tax incentives, and environmental protection investment. The assistance of relevant government departments helps to send "good signals" to the society of the times, attracting a large number of enterprises to carry out green technology innovation. The support behavior of relevant government departments can also alleviate the financing difficulties of enterprises, reduce the negative impact of financing constraints on research and development costs, promote green technology research and development innovation of enterprises, and promote high-quality economic development. This paper will illustrate the role of government support in green innovation and high-quality development of enterprises from various aspects, including national policy systems, theoretical analysis of relevant green innovation, and feasibility suggestions.**

## Keywords

**Green Technology; Government Assistance; Financing Constraints; High-quality Development.**

## 1. Introduction

The report of the 19th CPC National Congress attaches great importance to the construction of ecological civilization and the trend of green development. In response to increasingly stringent environmental regulations, companies must not only control the discharge of pollutants and achieve energy conservation and consumption reduction, but also reduce natural environment costs and stabilize economic returns. Therefore, enterprises should strengthen the research and development of independent innovative products of green technology to achieve a win-win situation of ecological and economic benefits.

At this stage, people from all walks of life are gradually concerned about the impact of green technology innovation on the sustainable and healthy development of society and economy, and actively advocate that environmental benefits and social and economic benefits should be included in the overall goal of technological innovation. At the same time, experts and scholars from all over the world have not reached a consensus on the definition of green technology innovation, but they can be roughly divided into the following two categories:

First, the technological innovation of green manufacturing includes technological innovation of green design products, green machinery and equipment, green processing technology and green recycling packaging design. Second, the technological innovation of green management

methods includes management modes such as green enterprise management mode, green production mode, and green digital supply chain management.

Enterprises can design green raw materials and commodities according to green technology innovation, and at the same time apply green equipment production and green digital supply chain management and operation, which can significantly reduce product costs and operating costs.

In addition, under the condition that environmental protection is well-received, the company's proactive green technology innovation can transmit a proactive corporate social responsibility brand image to the outside world. At the same time, customers are more inclined to buy green products, which is conducive to the improvement of the market share of enterprises.

Therefore, green technology innovation not only conforms to the strategic plan for the development of my country's natural environment, but also generates economic benefits for enterprises..

## 2. Policy Support

Chinese government agencies attach great importance to the assumption of ecological civilization construction, green development and high-quality development. On November 26, 2019, the "Emissions Gap Report" released by the United Nations Environment Programme also emphasized that from 2020 to 2030, the world's greenhouse gas emissions should achieve the corresponding overall reduction target every year to avoid more obvious climate change. Variety. As an advocate of people's common destiny, China undertakes the multiple tasks of maintaining the stability of the world economy and fulfilling the overall goal of energy conservation and emission reduction.

In 2021, the General Office of the State Council also announced the "Guiding Opinions on Accelerating the Establishment and Improvement of a Green and Low-Carbon Circular Development Economic System", re-establishing a green technology innovation system guided by the city's growth in my country, and encouraging companies to develop green and low-carbon technologies. , to speed up the independent innovation and transformation of scientific and technological achievements and the development and design of creativity.

In recent years, enterprises have achieved certain results in developing the green economy by virtue of government subsidies and preferential policies such as tax and fee reduction. Access to financing for diversified businesses.

From the reform of environmental finance, we can obtain the institutional guarantee for regional environmental expenditure. As early as 2007, the state has listed the environmental protection functional classification subjects separately in the government revenue and expenditure budget, and then set the policy objectives of environmental finance as: energy conservation, pollution prevention, circular economy and other 14 aspects. Financial and environmental protection subsidies also have reference and reference value for our now proposed "environmental green scientific research fund". According to the national financial final accounts data disclosed by the Ministry of Finance, the scale of national environmental expenditure in 2020 is as high as 633.34 billion yuan, which is 6.36 times that of 99.58 billion yuan in 2007, and its proportion in general public budget expenditure has also increased accordingly. It reflects the increasing importance that the country attaches to the green and sustainable development of the economy and society, but also the current situation of my country's financial imbalance in environmental protection.

Obviously, we can see that in recent years, enterprises have achieved certain results in developing the green economy through government subsidies and preferential policies such as tax and fee reductions. For the construction, we want to diversify the financing channels of enterprises.

Relevant literature shows that the lack of corporate innovation investment is a major bottleneck restricting the improvement of independent innovation capabilities of most enterprises in my country, and the green technology innovation of enterprises is facing certain financing constraints. The financing constraints and the R&D investment of enterprises have a significant impact on the green and high quality of enterprises, and the financing constraints limit the R&D investment of enterprises.

According to Zhang Xuan et al. (2017), it was found that, compared with companies with bank credit, companies without bank credit will reduce the possibility of investing in R&D innovation. We make a brief analysis. The reason for this phenomenon may be that there are banks Credit companies have less external financing constraints than non-credit companies, and they will also invest in green new technology research and development with "high risk, long cycle, and irreversible cost" through financing.

According to the analysis of relevant data, the research of Chinese scholars at this stage mainly focuses on two levels: R&D investment and environmental regulation. According to the above environment and existing insights, it is proposed that the "Green Technology Research Fund" will study its impact on green technology from the interaction of many dynamic elements such as government subsidies, financing constraints, and the infrastructure of the green technology innovation system in the Chinese market. Innovation path impact.

### 3. Theoretical Analysis

Green technology refers to the ability to reduce consumption (environmental protection and energy conservation) and pollution (energy conservation and emission reduction), improve ecological and environmental protection, and create a contemporary technology management system in harmony with nature. It follows the laws of nature, saves resources, prevents and eliminates green ecological pollution and environmental damage.

The innovation of green technology requires enterprises to follow the concept of environmental protection in product research and development, product production, and the processes used in the production process. Therefore, compared with the technological innovation of general products, its innovation is more difficult, and enterprises have to face The risk and uncertainty of innovation are higher, and more stable and long-term R&D investment and R&D funding are needed as support.

#### 3.1. Fiscal Subsidies and Tax and Fee Reductions

Government financial subsidies and preferential policies for tax reduction and fee reduction for green innovative technology enterprises need innovation, and government assistance will provide better financial support for green technology innovation of enterprises. Because of the general direction and guiding role of the policy, it will release "good signals", thereby promoting the improvement of the sustainable operation ability of enterprises in many aspects.

Today, when the national environmental regulation is becoming more and more standardized, many enterprises will take the initiative to carry out innovative research and development of green technology in order to comply with the national policy, help the development of an environment-friendly economy, and improve their competitiveness in the market economy.

The government's financial subsidies and preferential policies for tax and fee reduction are of course very important, but in the context of my country's epidemic prevention and control, my country's fiscal expenditure balance has been subjected to more uncertain external shocks than before. The financial aid strategy proposes certain innovations.

### 3.2. Financing Constraints

Financing constraints have an impact on enterprises' green technology innovation. Government assistance can reduce constraints and be more conducive to enterprises to obtain better innovation results.

The channels for raising funds when an enterprise invests are mainly divided into: retained profits within the enterprise, debt financing and equity financing. In reality, the financial market is not as perfect as imagined, and external investors and internal managers have information asymmetrical problem.

Green technology innovation, as a new type of technological innovation proposed in recent years in line with "green and low-carbon, harmonious coexistence between man and nature, and promotion of high-quality economy", most of this type of enterprises are mainly small, medium and micro enterprises, and of course some have achieved significant. Achieve a mature enterprise like BYD. The government's policies can play a guiding role, and will release the future direction of the country's economic development to the market, and "green innovative technology products" will undoubtedly be the mainstream in the future, and the enterprises that produce this product have a large number of products within the foreseeable scope. For the healthy development of the national economy and its own interests, the financial market will lower the threshold of financing for this type of enterprise and support its innovation and R&D activities.

In this context, the reduction of financing constraints can better match the government's financial subsidies, and further help green innovation companies to research and develop new technologies from multiple dimensions. The quality of the company can finally get considerable profits, investors can also get interest income, the country's economy can achieve green, healthy and sustainable development, and ultimately achieve a win-win effect.

### 3.3. Economic System

The introduction of the "Green Innovation Technology Research Fund" into the market-oriented socialist market economy under socialist conditions can promote the establishment of a market-oriented green technology innovation system in China, thereby promoting the green, sustainable and high-quality development of the national economy. The positive signals of the general policy released by the state mentioned above are conducive to the development of green innovation technologies of enterprises. Through detailed analysis, we can see that its favorable effects include the following points:

The positive signal will send a signal to the financial market, and financial institutions will reduce the financing constraints of green innovative enterprises, thereby reducing the pressure on enterprise research and development;

The positive signal conveys the new concept of "green, energy saving and emission reduction" to consumers, prompting their consumption desire for green innovative products, indirectly influencing the demand, and providing a certain market foundation for green innovative enterprises;

Under the prospect of having a better market, green innovative enterprises (producers) increase investment in R&D and production of new green products, and expand the supply of green products in the market.

Under the background of the continuous operation of enterprises and the continuous stability of the market, gradually promote the upgrading of my country's consumer goods to the direction of green environmental protection, optimize the output structure and consumption structure, and finally promote the high-quality development of the domestic economy and the market-oriented green technology innovation system. Establish.

## 4. Feasibility Suggestions

Regarding the development of my country's green industry, the government's policy support for enterprises, and the relevant analysis issues that enterprises themselves need to make according to the current social environment, based on the above institutional background and theoretical analysis, the government provides theoretical support and combines relevant Based on theoretical analysis, this paper puts forward relevant feasible suggestions from the perspective of government and enterprises:

### 4.1. Government Level

#### 4.1.1. Optimize the Initial Development Environment of Green Innovation Enterprises

The state and local governments should continue to increase their strong support for relevant enterprises, that is, for small and micro enterprises with the ability to "green emission reduction", the government should provide corresponding tax policies and provide financial support. And it is necessary to analyze the utility that innovative enterprises can bring to society and the country from a long-term perspective. Each government decision-making must be consistent, sustainable and long-term, and optimize the initial development path of local green innovative enterprises, so that there are People with ability to innovate can innovate and dare to innovate.

#### 4.1.2. Continue to Increase Subsidies and Preferential Policies for Energy-saving Enterprises with High Energy Consumption

Theoretical research shows that when High-energy-consuming enterprises carry out green innovation and energy conservation and emission reduction, they are always limited by relevant conditions. Therefore, the government should provide R&D subsidies for the development of relevant High-energy-consuming enterprises, and it is necessary to provide relevant R&D tax incentives for large-scale High-energy-consuming enterprises. For High-energy-consuming enterprises to purchase relevant environmental protection facilities, environmental protection devices, and technological transformation services, subsidies should be provided, and R&D and innovation should be taken as the basic points to improve the green emission reduction capabilities of enterprises.

#### 4.1.3. Concrete Financial Support Projects and Establish Relevant Regulations

Although my country has made initial progress in providing financial support to enterprises and subsidies for green innovation, and has further improved the environment, there are still problems such as insufficient government R&D expenses and preferential policies for R&D, and relatively single support methods. In this regard, the government should adjust the role of the policy, so that "good steel is used on the edge of the knife", money must be spent in the right place, and the effect of the government's financial subsidies varies according to the innovation ability of the enterprise, and the return effect obtained is also Therefore, it is necessary to introduce a variety of tax and fee policies, and analyze specific problems according to the situation of each enterprise to maximize the benefits of policy support.

### 4.2. Enterprise Level

#### 4.2.1. Science and Technology Innovation Small and Micro Enterprises Should Make Full Use of the Policy for Initial Development

For the initial development of science and technology enterprises, it is necessary to actively move closer to government policies, improve the utilization rate of policy support, share costs, reduce the survival pressure of enterprises themselves, and focus on scientific research and development and green innovation, so as to improve the quality of green innovation and development benefits. In addition, small and micro enterprises of scientific and technological innovation should also strengthen cooperation with related large enterprises, improve their

experience accumulation, reduce the occurrence of sunk costs, and improve the quality of their own development.

#### **4.2.2. On the Premise of Making Full Use of Policies, High-energy-Consuming Enterprises Should Strengthen Cooperation between Enterprises**

While using government policies and financial support, High-energy-consuming enterprises should also strengthen their own technical research on green energy conservation, and continuously improve their own energy conservation and emission reduction capabilities, so as to unify social and economic benefits, and promote the sound development of enterprises. At the same time, High-energy-consuming enterprises also need to cooperate with new energy enterprises, use related products and technologies of new energy enterprises, improve their own green innovation capabilities, and continuously accumulate relevant experience in them to promote the comprehensive development of green science and technology innovation of enterprises.

#### **4.2.3. New Energy Companies and Green Innovation Companies Should Respond to National Policies and Actively Promote Green Technology Innovation**

New energy companies can also use the support of national policies in the process of development. Under the premise of reducing costs, they should actively seek new energy utilization points, improve their own technical level of new energy development and energy use efficiency, and ultimately improve the overall greenness of the industry. Innovation level and create a good green innovation environment.

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## **References**

- [1] Zhang Ayang. Sustainability, Government Environmental Subsidy and Enterprise Green Technology Innovation [J]. Finance and Accounting Communications, 2021(22):52-55.
- [2] Wang Mingyue, Zhang Hao, Li Yingming, Wang Zitong. Double Heterogeneity Research on Green Technology Innovation Performance Conduction Path--Based on the Survey Data of 642 Industrial Enterprises [J]. Science and Science and Technology Management, 2021, 42 (08):141-166.
- [3] Xu Le, Ma Yonggang, Wang Xiaofei. Research on Environmental Policy Choice of Green Technology Innovation Based on Evolutionary Game: Government Behavior VS. Public Participation [J]. China Management Science, 2022(03):1-13.
- [4] Qin Guowei, Sha Haijiang, Di Guiying, Zhou Chenying, Wu Chengliang. Analysis of Influencing Factors of Green Technology Innovation in China [J]. Ecological Economy, 2017, 33(4): 53-57.
- [5] Chen Lishan, Fu Yuanhai. The dynamic characteristics of technological innovation affecting the high-quality development of enterprises under financing constraints [J]. China Soft Science, 2019 (12): 108-128.
- [6] Liu Jie. The impact of quality management practices on manufacturing performance--analysis of moderating and mediating effects [J]. Modern Economic Research, 2022(03):103-114.
- [7] Shi Shutao, Zhang Wuxin. Research on the Influence of Financing Constraints on Innovation Sustainability: Based on the Moderating Effect of Innovation Openness [J]. Contemporary Finance Research, 2022, 5(02): 24-37.

- [8] Zhang Xuesheng. Research on the impact of industrial agglomeration on the development of green economy from the perspective of technological innovation [J]. Journal of Fujian Normal University (Philosophy and Social Sciences Edition), 2022(01):80-90+152.
- [9] Liu Xinzhi, Zhang Pengfei, Shi Xiaoyu. Industrial agglomeration, technological innovation and high-quality economic development: An empirical study based on my country's five major urban agglomerations [J]. Reform, 2022(03): 1-20.
- [10] Yuan Yijun, Chen Zhe. Environmental regulation, green technology innovation and the transformation and upgrading of China's manufacturing industry [J]. Science Research, 2019 (10): 1902-1911.
- [11] Acemoglu D, Aghion P, Hemous B D. The environment and directed technical change[J]. American Economic Review, 2012, 102(1): 131-166.