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Impact of Green Fiscal Policy on Sustainable Development Performance of Chinese Enterprises

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Abstract. Since China's reform and opening up, the Chinese economy has made significant achievements in society. However, along with this growth, it is also accompanied by the adverse natural environment and the increasing scarcity of land resources and energy. It is precisely these traditional ways of economic and social growth in China, namely the extensive social management model, that have a significant impact on the sustainable development of China's economy and society. Against the historical background of actively promoting scientific development theory and promoting the transformation of the economy and society towards high-quality development in China, the public welfare characteristics of the environment have posed challenges to local government departments in adapting to and dealing with this phenomenon. The phenomenon of resource depletion and environmental pollution often accompanies production behavior and has the characteristic of cross-regional flow. China's green fiscal policy has undergone long-term development and reform and has initially established a relatively complete system and regulatory mechanism. Against the backdrop of increasing environmental awareness, China has gradually established a financial incentive policy system guided by environmental protection. The implementation of green fiscal policies in China has achieved significant results and has had a positive and direct impact on sustainable development performance. Novel green fiscal policy-industrial strategy integration analysis in the article in which big data innovation for policy enforcement, international collaboration, and green fiscal norm harmonization. The research shows green fiscal policies' dynamic growth and vital role in sustainable development in China by examining these patterns and future prospects.

Key words. Green Finance, Fiscal Policy, Enterprise Performance, Sustainable Development, Renewable Energy.

1. Introduction

The development of the modern social economy is accompanied by issues such as environmental pollution and resource depletion, which has driven the introduction of green fiscal policies aimed at internalizing external costs. However, fiscal policies are closely related to the sustainable development performance of Chinese enterprises, as the implementation of green fiscal policies not only plays a role in the environment but also inevitably has an impact on the sustainable development performance of enterprises. Therefore, studying how green fiscal policies affect sustainable development performance and how they promote sustainable economic development has become the research background and goal of this article. Currently, China is in a critical stage of economic transformation and market-oriented reform. During this period, the role of fiscal policy is crucial, as it can promote resource conservation and environmental protection, which plays an important role in promoting the realization of the "Chinese Dream". Meanwhile, China has gradually formed a complete environmental protection system during the process of reform and opening up, but the coordinated management system between environmental protection and economic development is not yet sound enough. Today, with the deepening of the scientific development concept and the increasing awareness of environmental protection, the green fiscal policy system guided by the principle of "both gold and silver mountains and green waters and mountains" is gradually improving. China has made significant progress in environmental governance and protection. At the same time, China is undergoing a period of market-oriented reform and economic structural transformation, and the national economic structure and financial and tax system are undergoing profound changes.

Uniquely, these findings explore how green fiscal policies affect business performance in China's economic transformation and market-oriented reforms. This study examines the complex ways green fiscal policies improve technical innovation, industrial structure, and micro-economic performance. These policies have positive and negative effects on technical innovation and industrial structure, which the article examines to better understand green fiscal measures' cost-benefit dynamics and enterprises' challenges and possibilities. The study adds to the global green fiscal strategy conversation by examining China's distinctive policy context, with its rapid economic expansion and significant environmental issues. China's massive environmental protection system and growing green fiscal policy framework, driven by "both gold and silver mountains and green waters and mountains," show developing nations how to balance growth and sustainability. This research shows how green fiscal policies, directly and indirectly, affect corporate

performance and how government incentives boost green technological innovation and sustainable business practices, strengthening the economy. This study compares China's budgetary strategy to others and gives global policy insights. The literature on fiscal policies, technological innovation, and industrial structure explains how green fiscal policies can meet global sustainable development goals. Comparing China's policies and results to others may provide best practices and challenges, expanding global fiscal policy's environmental integration conversation. This comprehensive method addresses a literature vacuum and aids research on green fiscal policies' global effects on corporate and economic sustainability.

A. Theoretical Framework

Theoretical framework discusses the intricate relationship between fiscal policy and corporate technology innovation, especially sustainability. By lowering costs and hazards, subsidies and tax incentives can increase green technology adoption, according to innovation diffusion theory. These technologies' benefits become clear when more organizations adopt them, setting standards. Resource-based companies function better with internal resources and skills. Research and clean technology fiscal policies help a company's innovation, sustainability, and technology. Businesses' ability to innovate and adapt to environmental and market changes is emphasized [1] – [3].

Fiscal policy's commercial effects are discussed in institutional theory. Companies must use green technologies to comply with sustainable laws and be trustworthy. This illustrates regulatory frameworks and public expectations alter corporate pressure responses. Technology and economic restructuring can help society sustain the environment, according to ecological modernization. Fiscal strategies that encourage green innovation boost economic growth and environmental modernization. This theory holds that fiscal policies foster innovation and social sustainability. Policymakers can comprehend how fiscal policies affect corporate IT innovation with these theoretical frameworks. Knowledge can foster green innovation and progress [4], [5].

Investigate these processes via innovation systems. Government, business, and knowledge networks promote innovation in this plan. By analyzing how fiscal policies interact with other innovation system components, researchers can better understand their impact on technological innovation. Budgets can also stifle IT innovation. Higher gains taxes may reduce R&D and IT investment. Complex fiscal incentive regulations and bureaucracy can impede innovation. Fiscal policies that reward incumbents can hinder innovation and economic sustainability. Addressing these difficulties requires clear, accessible, and long-term sustainable fiscal measures. Theoretical models help academics and policymakers comprehend complex systems and improve green innovation initiatives [6], [7].

B. Green Finance and Sustainability: A Review of Recent Research and Trends

Environmental deterioration and climate change make green funding a sustainable development priority. This article examines green finance studies and trends' policy and corporate effects. Recent research shows green finance rising. Springer showed that green finance publications climbed significantly from 2011 to 2021 and accelerated between 2022 and 2023. The Paris Agreement and UN Sustainable Development Goals raise environmental awareness. The research includes green loans, climate VC funds, and bonds. Different project sizes and risk profiles can extend green finance. Green bonds help the environment. Climate VCs are backing innovative climate startups. However, green funding offers enterprises favourable green project circumstances. These products benefit more stakeholders via green funding [8], [9].

Design affects green finance policy effectiveness. Recent research shows regional policy consistency. The inconsistencies alarm investors and businesses, decreasing green funding and environmental goals. Studies recommend "green" project requirements to avoid green-washing. Effective green financing and environmental goals require transparency and accountability. Standardized green bonds support ethical environmental projects. Transparent reporting and verification boost investor trust and green financing credibility. Green finance enhances economic and environmental technology. Environmental Development and Sustainability found green funding boosts clean tech R&D. Pollution management and renewable energy research benefit from green financing. More efficient and economical green solutions increase corporate competitiveness and sustainability. Tech startups can earn green energy subsidies. Innovation is funded by R&D tax incentives that cut development and implementation costs [10] – [12].

Green financing provides firms with options and issues. The International Journal of Engineering Optimization and Society discovered that green technology adoption costs may inhibit enterprises. Lack of green tech may also worry. Researchers advocate long-term strategic planning with sustainability aims to address these difficulties. Corporate strategy may need resource efficiency and waste reduction. Knowledge-sharing networks and researchers can share innovation and green practices. Universities assist corporations develop new technology and accessing cutting-edge research. Information and resource sharing helps industry consortia solve problems. A recent study suggests governments and corporations must work together to boost green investment. Through incentives, capacity-building, and public-private partnerships, policies can promote green innovation. Companies may engage in R&D, go green, and involve stakeholders to boost brand reputation and attract eco-conscious customers. Policymakers and corporations may develop a growth-promoting, eco-friendly banking sector. Businesses may create sustainable solutions and governments can support renewable energy and energy efficiency to meet demand. Public-private partnerships can fund and administer smart city and infrastructure initiatives [13], [14], [9].

Fast-growing green money may keep the economy going. A recent study concluded that well-designed legislation,

technology innovation, and policymaker-business ties facilitate green finance. More study is needed to detect trends, evaluate green finance projects, and predict sustainable future best practices as the sector grows. Economic, environmental, and public policy experts must explain how green money encourages sustainability. These varied perspectives can help academics and practitioners develop more complete environmental solutions [7], [15], [16].

2. Analysis of the Impact of Green Fiscal Policies on the Sustainable Development Performance of Enterprises

A. Green Fiscal Policy

Green fiscal policy is an economic policy and fiscal measure aimed at promoting environmental sustainability and reducing adverse impacts on ecosystems [17]. Its core goal is to achieve economic growth while reducing carbon emissions and maintaining ecosystems. This policy framework has been implemented through various methods, including support for renewable energy development, encouragement of green technology innovation, and fiscal incentives. Specific policy measures include carbon pricing and emissions trading, energy subsidies and incentives, green infrastructure investment, environmental finance policies, and emissions trading, among which the government introduces carbon taxes or emissions trading systems to incentivize industries and enterprises to reduce carbon dioxide emissions (Figure 1).

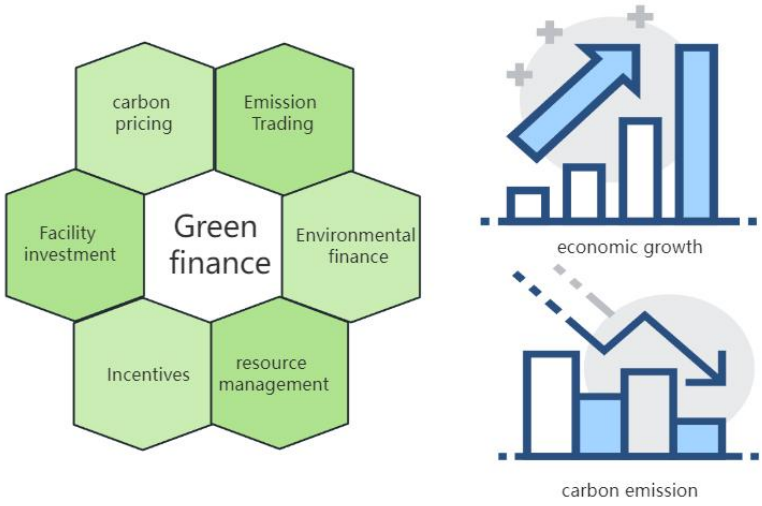

Figure 1. Green Fiscal Policy

In response to climate change and promoting sustainable development of enterprises, the government has taken a series of key green fiscal policy measures. By taxing carbon emissions or setting emission limits to create economic incentives, we can address the challenge of climate change. Energy subsidies and incentives constitute another key policy area, and the government can provide financial incentives, such as subsidies for renewable energy projects or incentives for the use of energy-saving equipment, to promote clean energy development and improve energy efficiency, thereby reducing carbon emissions [18]. The government can also increase investment in green infrastructure projects, including urban public transportation systems, bicycle lanes, renewable energy facilities, and waste treatment facilities. These investments not only improve infrastructure but also promote sustainable urban planning and lifestyle development, reducing dependence on harmful fossil fuels. Environmental fiscal and tax policies are another important aspect, encouraging businesses and individuals to adopt more environmentally friendly behaviors while providing funding to the government to support environmental protection projects and green development. The government also needs to support green innovation by providing research and development funds, fiscal policy incentives, or patent incentives to encourage the development of green technology and innovation, in order to address environmental challenges, create employment opportunities, and promote economic growth. Sustainable resource management is another key point of green fiscal policy, and governments can formulate policies to protect natural resources and ensure their sustainable use, including fisheries management, forest management, and water resource management, to maintain ecological balance [19]. Environmental information and education are also crucial. The government can support environmental education and information dissemination, raise public awareness and knowledge of environmental protection, and encourage people to participate more actively in environmental protection and sustainable development (Figure 2).

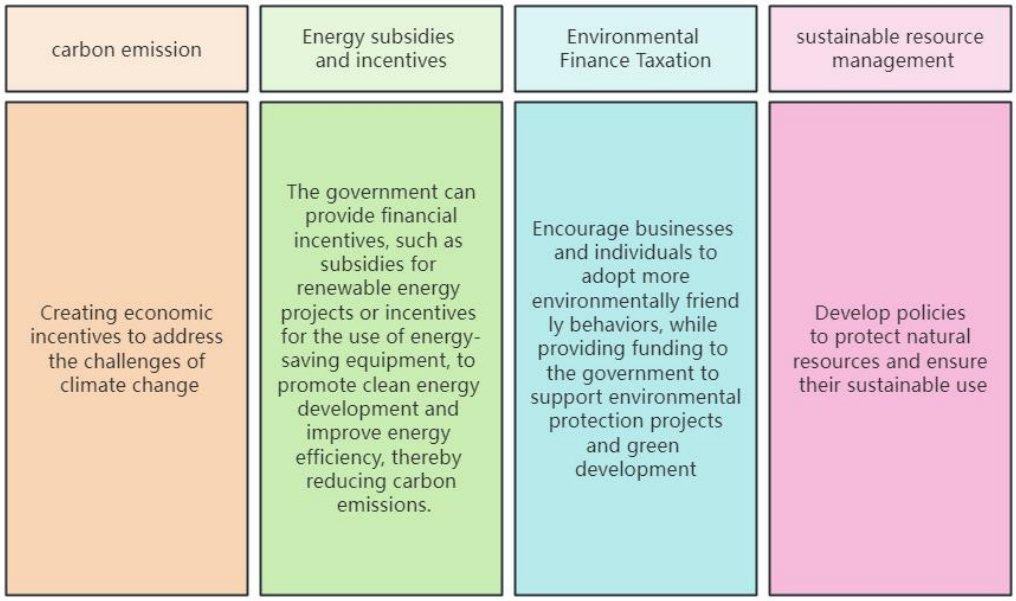

Figure 2. Key Points of Green Finance Policy

Green financing and government incentives encourage sustainability (Figure 2). Government subsidies for renewable energy or energy-saving technology cut carbon emissions and promote sustainability. They can support green firms and individuals and fund environmental preservation and growth. Figure 2 shows how carbon taxes or emission trading schemes might move energy subsidies and carbon emission money to green finance. Government conservation and green financing enhance sustainable resource management. This method has several uses. By making renewable energy cheaper and more widespread, financial incentives can reduce fossil fuel consumption and greenhouse gas emissions. Energy efficiency incentives help businesses and households save energy and pollution.

Air, water, biodiversity, and climate change can benefit from environmentalism. Green money can support sustainability through forestry, water management, and recycling. Green finance policies are necessary for environmental sustainability. Environmental conservation and clean initiatives are financially supported. The effectiveness of these interventions depends on design, transparency, and environmental compliance. These techniques help countries green their economy.

B. Analysis of the Mechanism of the Impact of Green Fiscal Policies on the Sustainable Development Performance of Enterprises

At the micro level, green fiscal policies have an impact on the economic performance and growth of enterprises through multiple channels. Firstly, the implementation of this policy directly has a significant impact on the business performance of the enterprise. Green fiscal policies are often accompanied by the collection of environmental taxes or other environmental-related fees, which leads to an increase in the cost and expenditure of enterprises in environmental governance. This means that companies have to bear higher internal costs to cope with expenses related to compliance with environmental regulations and standards. This cost pressure limits the capital investment and expansion plans of enterprises, as their resources are squeezed into fulfilling environmental responsibilities, which has a direct negative impact on the reproduction and production scale of enterprises [20].

Secondly, green fiscal policies also have indirect impacts on enterprises through intermediary transmission mechanisms. Enterprises have to undergo technological innovation and product structure adjustment due to environmental requirements to reduce environmental costs. This coercion to some extent encourages enterprises to adopt more environmentally friendly production technologies and methods, thereby improving production efficiency and resource utilization efficiency. This will further improve the production performance of enterprises, making them more competitive and innovative, with the potential to gain greater market share and profits [21]. Therefore, green fiscal policies have played a crucial role in incentivizing enterprises to innovate in environmental protection, which has had a positive impact on overall economic performance and growth (Figure 3).

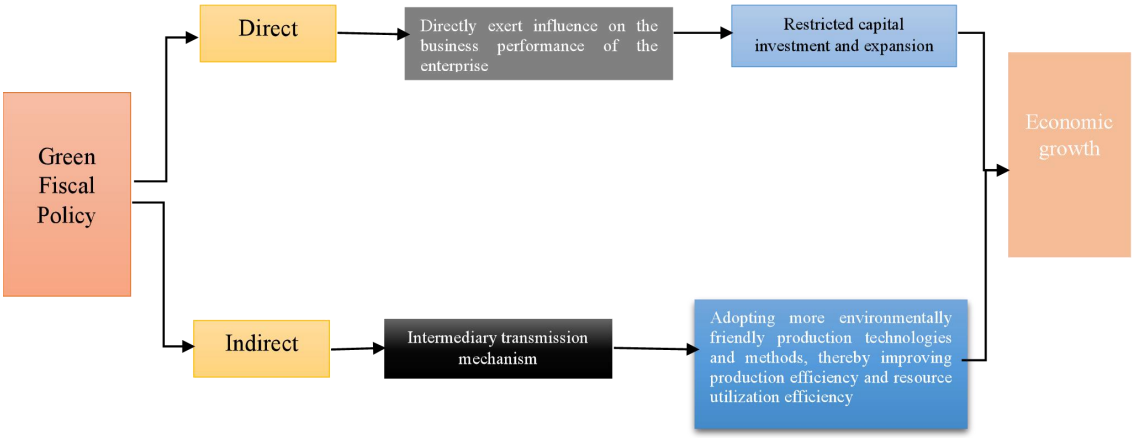

Figure 3. Mechanism of the Impact of Green Fiscal Policies on Corporate Performance

Summarizing the research results of the academic community, the direct path of green fiscal policy on enterprise performance mainly involves two key areas: production and sales. Specifically, the ways in which this policy affects corporate performance mainly include the following three levels: intrinsic costs, consumer choice behavior, and the interactive effects of fiscal policy (Figure 4). The image shows how green fiscal policies enhance firm revenues and sustainability. These methods cut costs. Green fiscal policies can dramatically reduce environmental protection investment costs by offering subsidies, tax exemptions, or other financial incentives. This cost reduction can boost sustainable firm performance by increasing profits. The image depicts how green fiscal policies affect company production. Carbon emission trading and pollution levies raise pollution costs, forcing enterprises to change their production techniques. Operations can benefit from cleaner production and reduced environmental impact. Green fiscal policies can boost company sustainability and competitiveness by changing behaviour.

Figure 4 also shows consumer choice. Green fiscal policies can influence consumer behaviour by raising polluting product pricing and promoting greener alternatives. Green technology and practice pioneers may benefit from sustainable product demand. Green fiscal policies can boost innovation and demand for sustainable goods and services while protecting the environment. To improve corporate competition, green fiscal measures must complement other policies, as shown in the graphic. Harmonies environmental, industrial growth, and trade policies to promote sustainability. By matching these policies, governments may support green technologies and corporate practices, producing a sustainable economy. Lastly, the chart shows how green fiscal policies affect business. Environmental and economic benefits from green fiscal policies include cost reduction, production behaviour, consumer choice, and policy interactions. Policymakers must carefully design and implement these policies to achieve their aims while avoiding obstacles and unforeseen consequences.

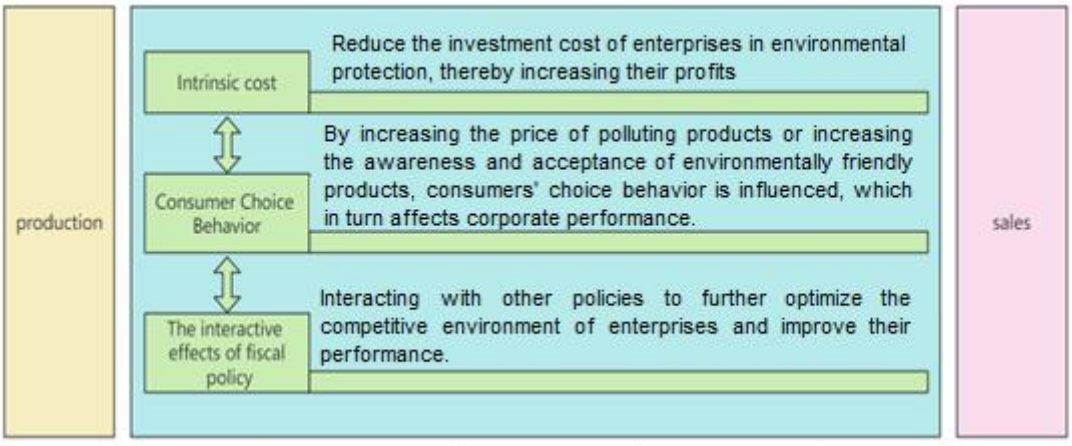

Figure 4. The Direct Path of Green Fiscal Policy on Enterprise Performance

The government adopts green fiscal policies to regulate the environment in order to improve environmental quality and reduce environmental pollution. These policy measures, such as resource taxes and pollution fees, directly increase the internal costs of enterprises in terms of pollution emissions and governance [22]. The burden of this growth has led to fewer and fewer expenses that enterprises can spend on expanding reproduction, causing companies to bear more costs and reduce their production efficiency. At the same time, it will also affect other production costs of the company. Therefore, the allocation mode of resources has changed. When the demand elasticity of green tax goods is high, it is difficult for enterprises to achieve tax burden transfer, which encourages consumers to make

other purchases, thereby affecting the performance of enterprises [23]. The green tax policy has also had an interactive effect on financial and tax measures, such as the government's collection of polluting substances that can lead to price increases, thereby reducing the actual wages of households and weakening consumers' market purchasing power. This also leads to a decrease in consumer investment, directly affecting the overall revenue level of the company, thereby directly leading to the adjustment of the company's resource allocation and internal industrial structure. Researchers have pointed out that in order to reduce the impact of government green economy fiscal policies on company performance, companies may make changes to their production structure to reduce environmental costs. However, this change may also increase the risk of unemployment among personnel on the original production line, further curbing corporate growth (Table 1).

Table 1. Impact of Green Finance Policies

Impact Indicators	Positive Impact	Negative Impact
Price Increase	None	Price increases may lead to a decrease in real house water and lower purchasing power.
Consumer Purchasing Power	None	The decline in consumer purchasing power directly affects the profit level of enterprises.
Enterprise Resource Allocation	None	Enterprise resource allocation and product structure adjustment to reduce environmental costs.
Product Structure Adjustment	Helps to reduce environmental costs and improve corporate performance	This may increase the risk of unemployment among employees on the original product line, further suppressing economic growth.

The implementation of green fiscal policies not only increases the production costs of enterprises but also triggers adjustments in resource allocation and product structure [24]. In addition, combined with the interactive effects of consumer choice behavior and fiscal policy, the impact of this policy can lead to changes in enterprise production decisions. In the short term, while technological conditions remain unchanged, rising costs and the compression of productive investment will inevitably lower the production efficiency of enterprises, leading to a decrease in profits and unsatisfactory performance. The direct transmission mechanism of green fiscal policies on corporate performance is thus highlighted in Figure 5.

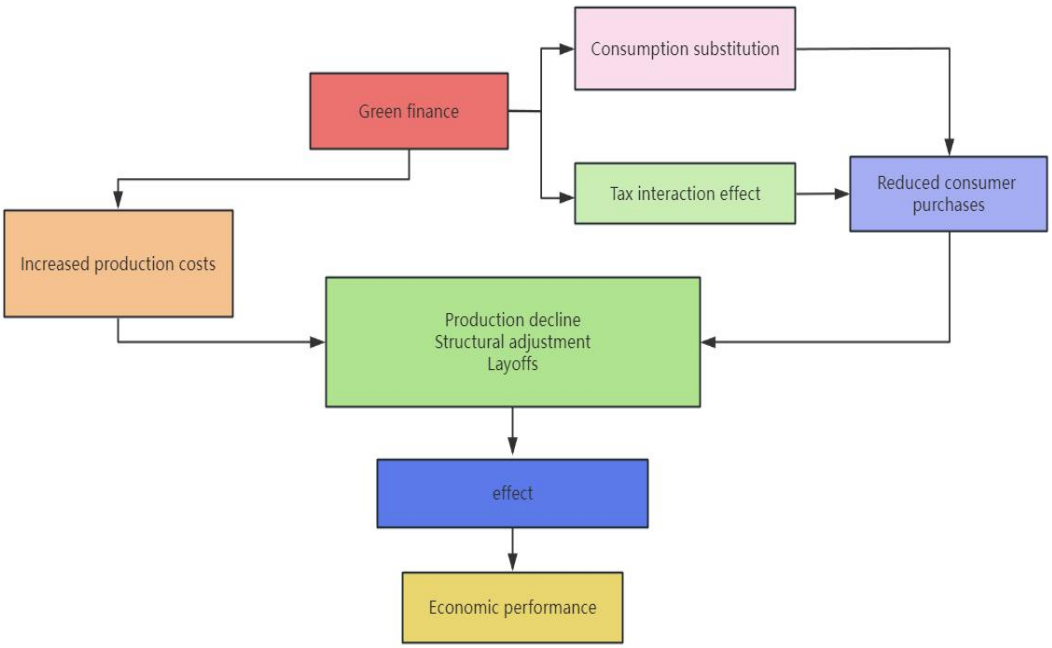

Figure 5. Direct Mechanism of Green Finance's Impact on Sustainable Development Performance of Enterprises

Figure 5 shows how green money affects business sustainability. Green loans, bonds, and other financial instruments help green firms. Green funding may raise production costs. Companies may initially spend more on pollution control devices and cleaner technology to comply with requirements and internalize environmental expenses. Future environmental and economic benefits outweigh immediate expenses. Sustainable approaches reduce production and change companies' structures. These difficult reforms are necessary for long-term survival. Green finance cuts waste, pollution, and inefficiency. This eventually improves the economy and environment. Green

financing boosts brand and market share because consumers appreciate sustainability. Green money and sustainability may distinguish companies. Alternative consumption displays green finance's creativity. Green taxes and regulations encourage businesses to meet the demand for sustainable goods and services, easing the transition to a sustainable economy. Green money may impact economic growth and sustainability (Figure 5). Green finance may help companies reduce environmental risks, invest in sustainability, and enter new markets. Green finance and sustainable practices may boost competitiveness, environmental resilience, and society and planet sustainability [12].

C. Analysis of the Mechanism of "Green Fiscal Policy-technological Innovation-Economic Performance"

Green fiscal policies have a dual impact on technological innovation, including both positive "promoting effects" and negative "inhibitory effects".

On the positive side, the promoting effect of green fiscal policies on technological innovation is mainly reflected in three aspects. Firstly, the cost effect it causes will encourage enterprises to increase investment in technological innovation to reduce production costs and cope with the burden of policies [25]. Secondly, the positive incentive mechanism contained in policies will stimulate enterprises to increase investment in environmental technology innovation, thereby enhancing their innovation motivation. Finally, green fiscal policies guide consumers to gradually accept the concept of green consumption through consumption effects, thereby promoting enterprises to make environmental protection an important advantage in market competition and forcing them to maintain competitiveness through technological upgrades. On the negative side, green fiscal policies also have a certain inhibitory effect. Firstly, policies may crowd out the funds used by enterprises for innovation, especially in situations where funds are limited. Enterprises may reduce their investment in technological innovation to ensure normal production and operation. Secondly, green fiscal policies may increase the cost of technological innovation, as technological innovation itself carries certain risks of failure, such as high-cost investment, long conversion cycles, and uncertain returns. The increase in production costs brought about by policies will exacerbate this risk (Table 2).

Table 2. The Impact of Green Fiscal Policies on Corporate Technological Innovation in Both Positive and Negative Aspects

Aspect	Positive Impact	Negative Influence
Cost Effect	Enhance enterprises to increase investment in technical innovation to reduce production costs and scope with the border of policies.	May squeeze out the funds used by enterprises for innovation, specifically in situations where funds are limited, enterprises may reduce their investment in technical innovation.
Positive Incentive Mechanism	Simulate enterprises to increase investment in environmental technology innovation and enhance their innovation motivation.	It may increase the cost of technological innovation, as technological innovation itself carries certified risks of failure, such as high cost investment, long conversion cycles, and unknown returns The increase in production costs caused by policies will exacerbate this risk.
Consumption Effect	Guide consumers to gradually accept the concept of green consultation, promote enterprises to make environmental protection an important advantage in market competition and force them to maintain competitiveness through technical upgrades.	May exhibit technological innovation activities of enterprises, as technological innovation itself carries a certificate risk of failure, and the increase in production costs caused by policies will exasperate this risk.

Green fiscal policies' positive and negative effects on company tech innovation are in Table 2. Green fiscal policies may boost business tech innovation investment, as seen in the table. This reduces production costs and meets policy. However, these constraints may cut corporations' innovation budgets. This matters when money is tight and digital innovation investment drops. Environmental technology innovation is encouraged by green fiscal policies. However, these laws may increase tech innovation costs. Failure risks include significant investment, extended conversion time-frames, and questionable technological innovation returns. Policies that raise production costs increase risks. Eco-economics encourages green consumption. Environmental protection can spur innovation in companies. The policy may reveal corporations' technical innovation, which is bad. Technology risk increases with higher manufacturing costs. Table 2 exhibits two green fiscal policy effects on business tech innovation. They can enhance innovation and sustainability but raise production costs and cut innovation funding. To promote technology and reduce commercial impacts, green fiscal policies must balance these factors [16].

Although there is a coexistence of positive and negative effects of green fiscal policies on technological innovation, the academic community generally recognizes the overall positive role of technological innovation in economic development. In the long run, the "innovation compensation effect" brought about by green taxes can partially offset the cost of complying with policies, and on the other hand, comprehensively improve the competitiveness and production efficiency of enterprises, achieving a win-win situation between environmental protection and economic growth. In addition, technological upgrading can be further divided into pollution control technology and production technology. The improvement of the former can reduce the costs brought about by green

fiscal policies, while the upgrading of the latter can help improve the production efficiency and product quality of enterprises, further enhance their competitiveness, and promote enterprises to enter a virtuous cycle, increase profits, and improve economic performance (Figure 6).

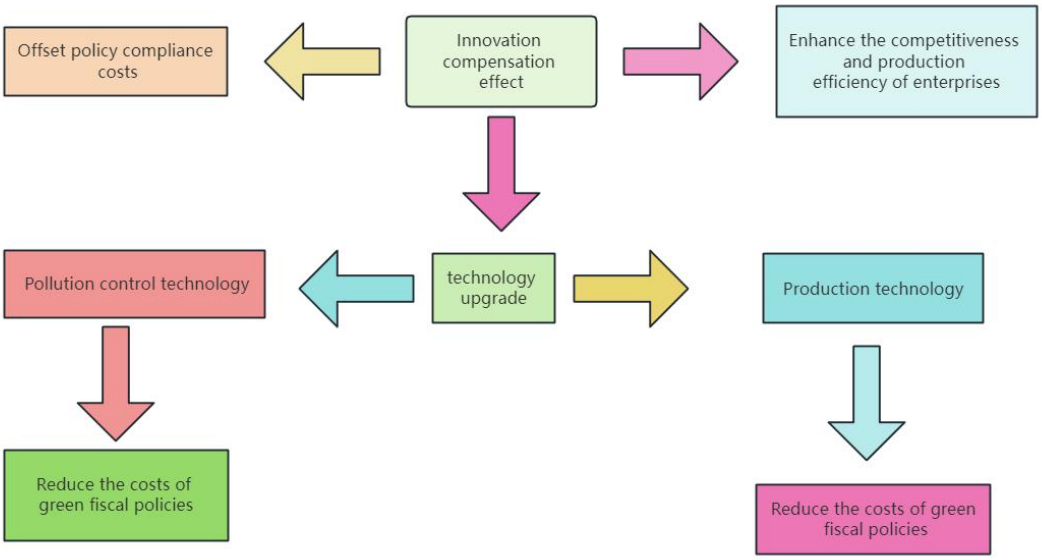

Figure 6. Technological Innovation of Green Finance Policy

Figure 6 shows that green finance programmes enhance enterprise technical innovation. Significant benefits include lower green compliance expenses. Green funding like pollution control taxes and carbon emission trading programmes may raise polluters' manufacturing costs. Greener technology reduces environmental impact and compliance costs for businesses and the environment. Green finance boosts corporate competitiveness. New green tech can help businesses. Sustainable businesses may attract clients with eco-friendly products. Investment in clean, efficient technologies may save operational costs and boost competitiveness. The graphic also highlights how innovation improves output. Green technologies conserve energy, resources, and trash. These changes can save costs and raise profits, strengthening companies.

Policymakers should consider various variables to maximize green financing's impact on IT innovation. First, policy design matters. Tax advantages, subsidies, and loan guarantees for clean technology adoption stimulate innovation. Accelerate innovation with green technology R&D and business-research alliances. Economic greening is hard. Certain companies may lack the financial resources to invest in new technologies and hence need financial support. Certain industries are deficient in environmentally friendly technologies, which require research and development as well as the transfer of technology. Ultimately, green funding strategies have the potential to foster both environmental and economic technological advancements. The provision of economic incentives and the establishment of a supportive ecosystem can serve as powerful motivators for firms to allocate resources towards the adoption of clean technology, thus contributing to the creation of a sustainable future.

D. Analysis of the Mechanism of "Green Fiscal Policy Industrial Structure Economic Performance"

The primary impact mechanism is that green fiscal policies can trigger the survival of the fittest effect, thereby promoting the optimization and improvement of industrial structure [26]. Green fiscal measures may have interacted complexly. ECI limits raise corporate production costs. Carbon emissions taxes, pollution levies, and clean technology incentives can do this. Businesses must adjust to survive in an eco-conscious market owing to financial pressure. Companies reconsider manufacturing and product offerings owing to rising costs. This includes exploring alternative production methods, investing in greener technology, and optimizing resource consumption. The green fiscal policy market necessitates corporate adaptation. Environmental fiscal strategies help enterprises and sectors. New environmental laws may bankrupt companies. Only the strongest, most inventive, and sustainable enterprises succeed. Industrial structure changes gradually but radically due to environmental adaption. Polluting, resource-intensive businesses close. New, greener industries replace them, greening the economy. Green fiscal policies change more than industry [5]. Policies impact the economy. Compliance and adjustment costs may cause short-term issues but boost resource efficiency, competitiveness, and economic sustainability. Green fiscal measures are complicated (Figure 7). These policies encourage survival of the fittest, industrial optimization, structural improvements, and economic transformation, making the economy more sustainable and environmentally friendly.

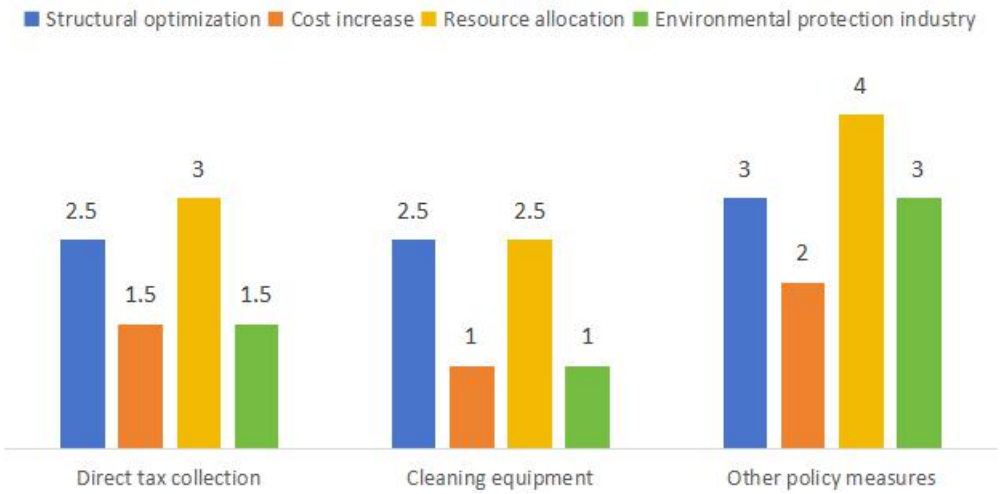

Figure 7. The Impact of Green Fiscal Policies on Industrial Optimization

Green fiscal policies can also generate green barrier effects, hindering market access for polluting enterprises and attracting the participation of green enterprises [27]. The preferential fiscal policies in the green fiscal policy system are also attracting enterprises to transform into clean industries. By forming green barriers, green fiscal policies can curb the expansion of polluting industries and promote the development of clean industries, thereby optimizing the industrial structure as shown in Table 3. Consider this effect to see how green fiscal policies reduce pollution and boost clean sectors. Green barriers affect industrial structure as seen in the table. Medium-impact variables include polluting businesses' market constraints. Green fiscal policies discourage polluting companies from entering or expanding. Rising green enterprise engagement is another important sign. This shows that green fiscal policies have attracted more green businesses, increasing the green industry. Good because it encourages sustainable industry. The table also shows polluting companies' average medium-impact cost increase. This shows that green fiscal policies cost polluting firms, which may encourage them to enter green industries. The table also shows considerable marginal manufacturing cost increases. Green fiscal initiatives have significantly boosted business production costs, deterring polluters and encouraging cleaner practices. Good fiscal policy for the clean industry matters. Clean sector fiscal incentives boost business migration. Fiscal incentives are needed for industrial greening. Table measures how green fiscal policies affect industrial structure. Polluting enterprises' average cost growth was moderate, suggesting compliance costs may not deter them. The significant marginal production cost increase indicates how green fiscal policies change the industrial structure and corporate finances. Table 3 shows how green barriers minimize pollution and promote clean industry.

Table 3. Green Barrier Effect and its Impact on Industrial Structure

Impact Indicators	Value	Remarks
Construction in Market Access for Polling Enterprises	Medium	Observing market access for polling enterprises and raising their entry barriers to the market.
Incremented Participation of Green Enterprises	High	It has attracted more green enterprises to participate and resourced the development of environmentally friendly industries.
Average Cost Increase of Polling Enterprises	Medium	This increases the economic costs of polling enterprises, forcing them to prefer environmentally friendly industries when choosing to enter the industry.
Marginal Production Cost Increase	High	This has increased the production costs of enterprises and is further behind the development of polling enterprises.
The Attachment of Fiscal Policy Preferential Policies to the Clean Industry	High	Attract enterprises to transform into clean industries through preferential Fiscal policies.

From the demand side, consumers' choices are also the fundamental driving force affecting the optimization of industrial structure. Because the ultimate industry choice of a company is constrained by consumer decisions. With the continuous improvement of green tax, the concept of green consumption has gradually taken root in people's hearts, and the demand for environmentally friendly products continues to expand. The change in consumption structure will trigger adjustments in the production structure of enterprises, incentivizing them to allocate more resources to green production, thereby promoting the optimization and upgrading of industrial structure. The impact mechanism of the evolution of industrial structure on the economic performance of enterprises is of great

significance. The transformation of industrial structure is an essential requirement for the acceleration of national economic development, and also a key factor in the core differences between developed and developing countries. This is closely related to the transmission mechanism of "green fiscal policy industrial structure economic performance" (Figure 8).

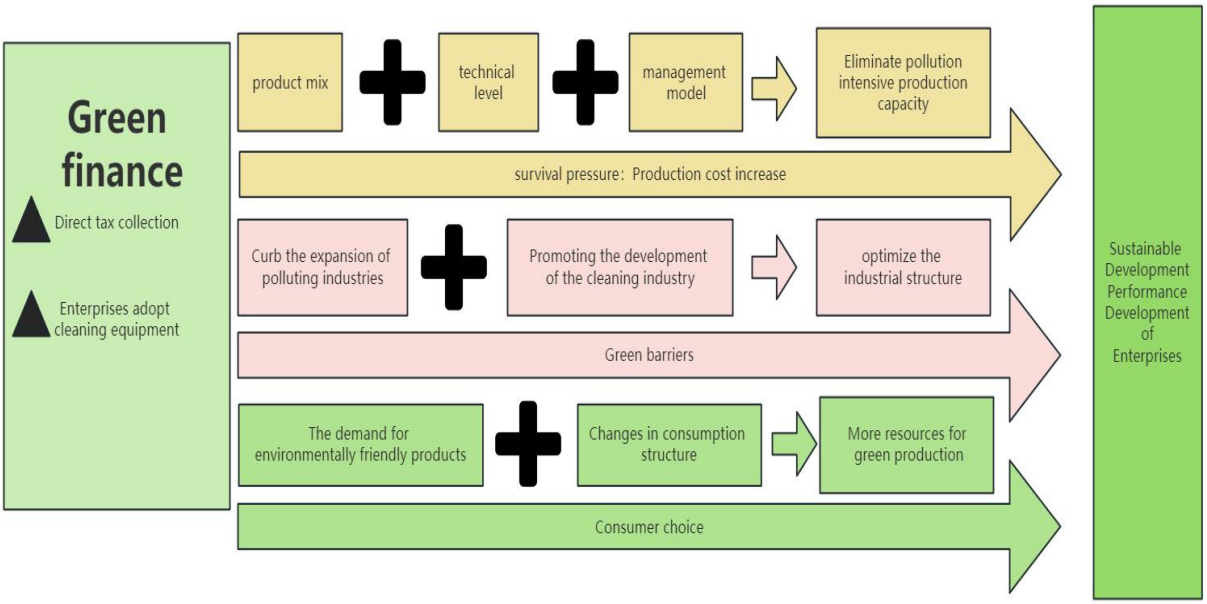

Figure 8. Green Finance Transmission Performance Chart

Gearbox Performance Chart evaluates green finance's environmental impact. Green financing projects' environmental impact is assessed by product mix, technical skills, management, and environmental performance. Product mix reveals green financial instrument variety and availability, making it important. Green loans, climate venture capital funds, and bonds help enterprises get green money. This diversity accommodates project sizes and risk profiles and promotes sector-wide innovation and sustainability. Financial decisions by policymakers can help green projects and the environment. Project developers and banks need technology. Financial institutions assess green project environmental risks and prospects. Funding environmentally friendly enterprises requires investor environmental impact evaluation. Green project developers need IT experience. Technical support may help developers meet green financing standards, encouraging green ventures.

Management model monitors and evaluates financial institution risk. Risk frameworks must identify and mitigate green investment environmental risks. Strong monitoring and assessment mechanisms ensure projects satisfy environmental targets, highlighting green money. The chart may assess these management approaches and offer green finance's environmental effect improvements. Environmental performance indicators in the chart measure green finance's impact. Indicators include pollution reductions, renewable energy use, energy efficiency, resource conservation, and clean technology investment. These factors help policymakers assess and improve sustainable green financing schemes. The Green Finance Transmission Performance Chart assesses green finance schemes thoroughly. Analysis of these key elements can help policymakers enhance green finance's environmental impact and promote sustainable development.

3. Main Issues in Green Fiscal Policies

Compared with a mature market economy, China's green fiscal policy is relatively single and lacks sufficient macroeconomic regulation. When dealing with serious resource and environmental issues, the current green fiscal policy makes it difficult to effectively promote orderly energy-saving and emission-reduction measures (Figure 9).

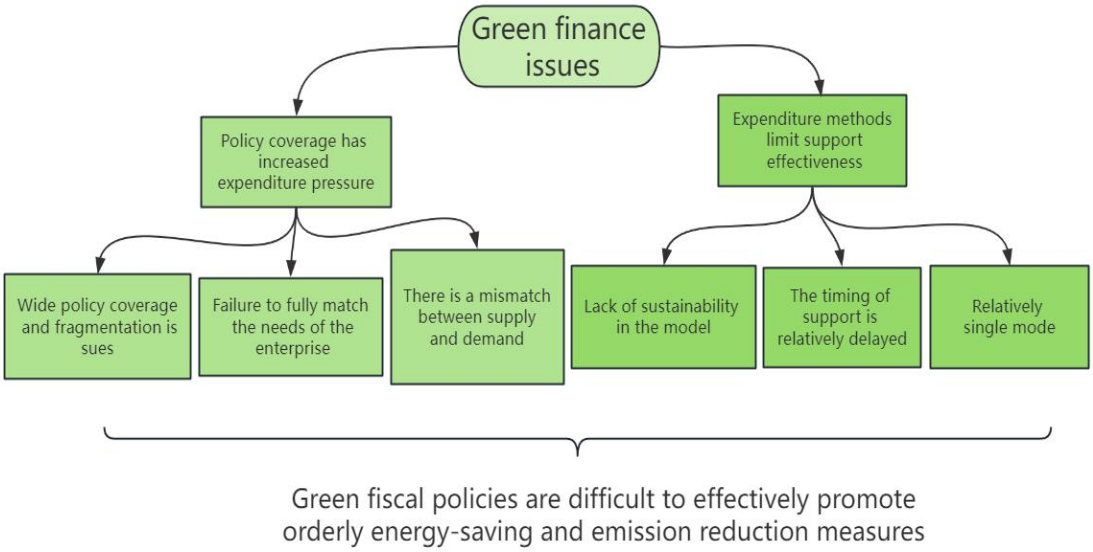

Figure 9. Shortcomings in the Implementation of Green Finance

The shortcomings and deficiencies of this policy include incomplete policies and insufficient punishment for violations [28]. Insufficient green finance policies hurt sustainability. Undefined "green" projects are a major issue. This uncertainty can lead to green-washing, where corporations appear to be green to make money. Global governments must discover and encourage sustainable green projects. Inconsistent regional policy is another issue. Green finance policies worry businesses and investors, making large-scale environmental goals harder to implement. Aligning these standards and giving explicit principles will improve green finance resource allocation and transparency. Insufficient financial institution guidance is another concern. Financial institutions may overlook sustainable and fraudulent investments without environmental effect criteria. Financial institutions require clear political advice to make educated judgments and support sustainable initiatives. Additionally, green finance tools' limited reach can limit project financing and impact. Policymakers should explore and promote more green project financing options to enhance green finance.

Insufficient enforcement and low green-washing fines may hurt green finance. Financial firms may ignore green finance legislation without supervision and consequences, diminishing their influence. To ensure compliance and green funding integrity, policymakers should boost green-washing punishments and enforcement. Green finance schemes risk public trust without transparency and accountability. Policymakers should require financial businesses to report green financing and fix errors. Addressing SMEs' limited green funding and short-term investment goals is also important. Policymakers should simplify SME applications and promote green credit. Investors should also consider green initiatives' long-term benefits to encourage sustainability over short-term gains. Finally, to enhance green finance, address these issues. Clarify language, unify policy frameworks, assist financial institutions, expand green financing tools, increase enforcement, improve transparency and accountability, and support SMEs and long-term investment. This may help policymakers strengthen the financial system for sustainable development.

A. Policy Coverage Has Increased Expenditure Pressure

The widespread coverage of policies leads to fragmentation in policy formulation, which in turn affects the reasonable setting of expenditure items. The distribution of fiscal funds is too dispersed, which increases the pressure on fiscal expenditure and fails to effectively reflect the role of concentrating fiscal resources to support key areas, making it difficult for the scale effect of fiscal expenditure to be fully realized. Taking environmental protection policies as an example, environmental protection needs to comprehensively consider multiple aspects such as atmosphere, water, and soil. Due to the diversity of different pollution factors, policy formulation needs to consider numerous pollution-influencing factors, which leads to the continuous refinement and expansion of the scope of policy support, thereby increasing the pressure on green fiscal funds. In addition, the green fiscal policy has not fully matched the needs of enterprises, which is manifested in multiple aspects. The threshold set by the policy is relatively high, which is not in line with the current green development reality of enterprises. The policy incentive mechanism is relatively single and fails to meet the diversified cost needs of enterprises in terms of funds, manpower, and space [29]. The policy declaration process is relatively complex and fails to meet the needs of enterprises for convenience and benefit. The procedural nature of the policy reward mechanism fails to meet the needs of enterprises for timely financial support [30]. This mismatched supply and demand relationship leads to insufficient enthusiasm of enterprises in the field of green investment, unwilling to bear expenditure responsibilities such as technological transformation and environmental governance, resulting in the government having to bear excessive governance costs and responsibilities (Figure 10).

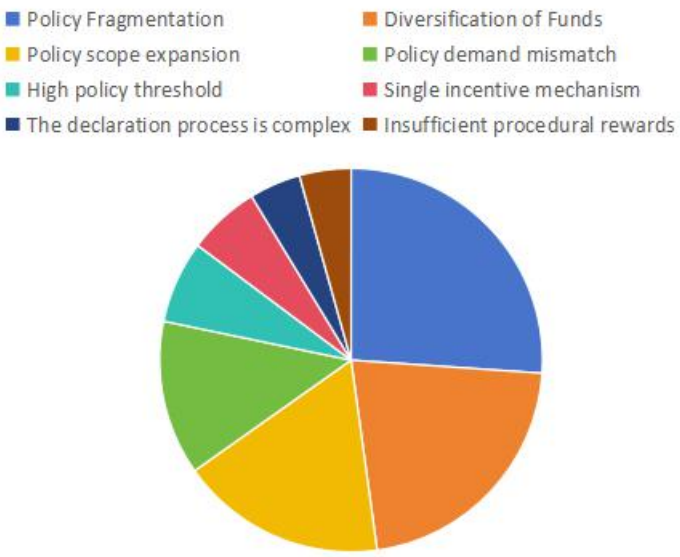

Figure 10. Problems with Financial Coverage

B. Expenditure Methods Limit Support Effectiveness

The financial support methods for green investment have certain limitations and fail to fully align with the key issues of enterprise development [31]. The fiscal green investment model is relatively single, mainly supported by direct expenditure and financial incentives. This "point to point" decentralized fiscal expenditure method makes it difficult to meet the funding needs of enterprises in clean production and technological transformation. This single expenditure model limits the maximum utility of expenditure funds and fails to form spillover and agglomeration effects in the field of green investment. At the same time, it is also difficult to effectively guide social capital to follow and support economic development. The timing of fiscal green investment support is relatively lagging. Enterprises carrying out clean production and energy-saving technological transformation may affect their production progress, and the expenditure on technological transformation costs is also one of the main reasons why enterprises are unwilling to carry out technological transformation [32]. In addition, high-tech and emerging technology enterprises require significant financial support in the early stages of technology research and development, talent introduction, and achievement implementation. The current fiscal green investment is mostly based on the fact that the enterprise has completed the transformation or is in line with the transformation process, which does not match the urgency of the enterprise's funding needs. Finally, the current fiscal green investment model lacks sustainability. Ecological environment governance is a gradual process, and technological transformation by enterprises also takes a long time. However, current fiscal expenditures are usually one-time, failing to meet the long-term funding needs of enterprises for technological transformation and pollution control, and failing to establish a long-term mechanism for sustainable development of green industries and pollution control (Table 4).

Table 4. Limitations of Green Investment Financial Support Methods

Limitations	Describe
Single Fiscal Green Investment Model	Financial green investment is mainly supported through direct expenditure and financial incentives, stacking diversity.
Diversity in Meeting Corporate Funding Needs	A single expenditure model limits the maximum utility of expenditure funds and failures to generate spillover and aggregation effects in the field of green investment.
Difficultly Guiding Social Capital to Follow	A single expense model leads to insufficient transparency and standardization in the use of financial funds, making it difficult to attract social capital to support economic development.
Relatively Delayed Support Timing	The timing of financial green investment support is relatively lagging, and it is unable to solve the differences accounted for by enterprises in carrying out clean production and energy saving technology transformation in a timely manner.
Mismatch with Corporate Funding Needs	Financial green investment is typically based on the fact that the enterprise has completed the transformation or is consistent with the transformation process, which does not match the incidence of the enterprise's funding needs.

Table 4 details green investment financial support technique limitations, and the research's contribution. Governments and stakeholders face various challenges for green investment and sustainable development, according to the study. Recognizing the single fiscal green investment model's limitations is key. This paradigm promotes green investment through direct spending and financial incentives without corporate funding diversity. This technique reduces spending fund utility and fails to aggregate green investments, according to a study. Policymakers must diversify financial support packages to meet firms' demands. Another key contribution is identifying the problem of steering social capital to an expenditure model. The research demonstrates that this method lacks financial fund transparency and standardization, making social capital for economic development difficult to attract. This shows green investment funds require clearer guidelines to attract investors and stakeholders.

Data also shows delayed financial green investment assistance. It shows that financial green investment support is slow to help companies switch to clean production and energy-saving technology. Companies need timely and targeted financial support to go green. Overall, this insight has major practical ramifications. The inadequacies of green investment financial support are explained to policymakers and stakeholders [13]. Addressing these restrictions and diversifying financial aid can improve green investment policies and sustainable development.

4. Strategies for Optimizing the Impact of Green Finance on the Sustainable Development Performance of Enterprises

A. Improving the Institutional Foundation of Green Finance

The exploration of long-term green fiscal system design should comprehensively consider multiple factors to ensure its sustainability [33]. Firstly, designing a green fiscal system requires full consideration of urban development planning, industrial development direction, technological innovation process, and the effectiveness of ecological environment governance. This means that it is necessary to coordinate the relationship between environmental protection and the development of green industries in order to achieve a win-win situation between ecological protection and economic development. On the basis of existing fiscal support policies, we should actively explore the development of a long-term fiscal system, while strengthening the synergy and coordination between fiscal policies, industrial policies, environmental protection policies, and financial policies. This helps to address current environmental and economic development issues while providing long-term support for future planning and support. There should be an effective connection between long-term and short-term policies to ensure consistency in policy formulation and implementation (Table 5).

Table 5. Multiple Factors in the Design of Long-term Green Fiscal Systems

Factors	Content
Urban Development Planning	Advisor factors such as urban spatial layout, infrastructure construction, and population size to ensure that the green Fiscal system is coordinated with urban development.
Industrial Development Direction	Combining industrial structure adjustment and transformation and upgrading, formulate fiscal policies to support green industries, energy conservation and environmental protection, and promote the green and low carbon development of industries.
Technical Innovation Process	Enhance and support technical innovation, improve resource utilization efficiency, reduce environmental pollution, and promote the research and application of green technologies.
Effect of Ecological Environment Governance	Make improving the quality of the ecological environment an important goal of long term fiscal policy, strengthening economic protection and restoration, and promoting sustainable utilization of resources and environment.
Financial Support Policies	On the basis of existing policies, establish a long term green fiscal system and strengthen the coordination between fiscal policies, industrial policies, environmental protection policies, and financial policies.

In order to enhance the foresight and sustainability of green fiscal policies, a mid-term green fiscal plan should be formulated [34]. This requires reviewing and analyzing economic, environmental, and fiscal data from the past few years, scientifically predicting the development trend of green industries and the demand for environmental protection in the next three to five years. The mid-term plan should reasonably predict the scale of fiscal revenue and expenditure to play the role of fiscal planning. This also requires coordinating research and development directions, social security, expenditure priorities, and assessment standards [35].

Finally, to ensure the long-term implementation of the green finance system, the government should take active measures to promote the transformation of social benefits into internal benefits for enterprises. On the one hand, the government should gradually reduce its leading role and encourage business entities to take on more responsibility for environmental pollution control. On the other hand, the government can strengthen the binding role of policy measures, including increasing the punishment of pollution, implementing the principle of "whoever emits will govern" to ensure that enterprise pollution control does not exceed standards, and adopting differentiated charging measures to internalize external costs.

Table 5 lists our research's long-term green fiscal system design challenges. Studies help sustainable development and environmental governance policymakers and

stakeholders. In the long run, green fiscal systems should prioritise urban planning. Based on urban design, infrastructure construction, and population, studies show green fiscal system cooperation with urban expansion. Politicians must address environmental issues in urban planning for sustainable growth. Long-term green fiscal systems should boost the industry. Research advises merging industrial structure modification, transformation, and upgrading to produce fiscal policies that encourage green industries, energy conservation, and environmental preservation. Fiscal measures should help the green, low-carbon industry.

Research shows that long-term green fiscal system design involves technology innovation. Technology can minimize pollution, increase resource use, and encourage green tech. Tech drives sustainable growth, therefore budgets should support it. The study also reveals how ecological environment governance influences green fiscal systems over time [8]. A long-term budgeting plan to improve the environment, safeguard the economy, and promote sustainable resource and environmental use is suggested. Economic policy should promote sustainability to protect resources. This idea has tremendous practical implications. Sustainability-focused green fiscal systems are preferred by policymakers and stakeholders. Urban development planning, industrial growth direction, technical innovation process, ecological environment governance, and financial support policies can strengthen green fiscal policies for sustainable development and environmental protection.

B. Enriching the Participants in Green Investment

The investment of fiscal funds in the development of green industries and environmental governance represents the needs of the country and society, while the financial market focuses more on pursuing profits and hedging. Therefore, fiscal funds should play the role of leveraging financial capital to invest in the green field. This requires establishing long-term cooperative relationships to achieve effective cooperation between fiscal funds, financial capital, financial products, and financial instruments. This cooperation can be achieved by expanding the scale of green finance, enriching the types of green finance products, and improving green finance business services. At the same time, it is necessary to develop and implement standards for the green finance industry. This cooperative relationship can also promote market participation in the development of green industries and improve their competitiveness. The design of green fiscal policies needs to consider long-term, forward-looking, and sustainable aspects, while actively guiding enterprises and financial institutions to participate in green development and establish long-term cooperative relationships to achieve a win-win situation for environmental protection and the economy [35].

Collaborative innovation between green industries and other industries is an important strategy for industrial structure adjustment and optimization, and has crucial significance in promoting the transformation of economic development towards a more environmentally sustainable model. Green fiscal policies should focus on strengthening collaborative innovation between green industries and other industries to support the rapid development of high-tech and emerging industries, promote the upgrading of traditional manufacturing industries, and establish a green industry system. The green fiscal policy should serve as a bridge to encourage different industries to leverage their respective advantages, with complementary advantages and resource sharing as the premise, and achieve common interests of all parties through collaborative innovation. This helps to reduce resource waste and avoid isolated competition among industries. Green fiscal policies should play an incentive and constraint role. Special attention should be paid to the agglomeration of pillar industries to form industrial clusters with a "siphon effect". Financial resources should be more invested in technology-leading enterprises with strong innovation and core competitiveness to create brand effects and encourage them to play a leading role in green innovation. It should guide the flow of green innovation resources to innovative and high-tech enterprises, and cultivate the "backbone" of the industry. In addition, enhancing the energy conservation and environmental protection capabilities of enterprises should be an important strategy to support the development of small and micro enterprises, and financial funds should be mainly invested in projects such as encouraging enterprises to carry out technological transformation, introduce talents, promote technological innovation, and develop green products [36]. We should also increase efforts to transform traditional processing and manufacturing industries, gradually eliminate heavy industrial enterprises with high energy consumption and low added value, and actively support the transformation of high-energy consuming industries to green. We should actively explore cooperation models between green industries, modern agricultural parks, and internet celebrity homestay industries, in order to promote green and sustainable development on the basis of new rural and new agriculture (Figure 11).

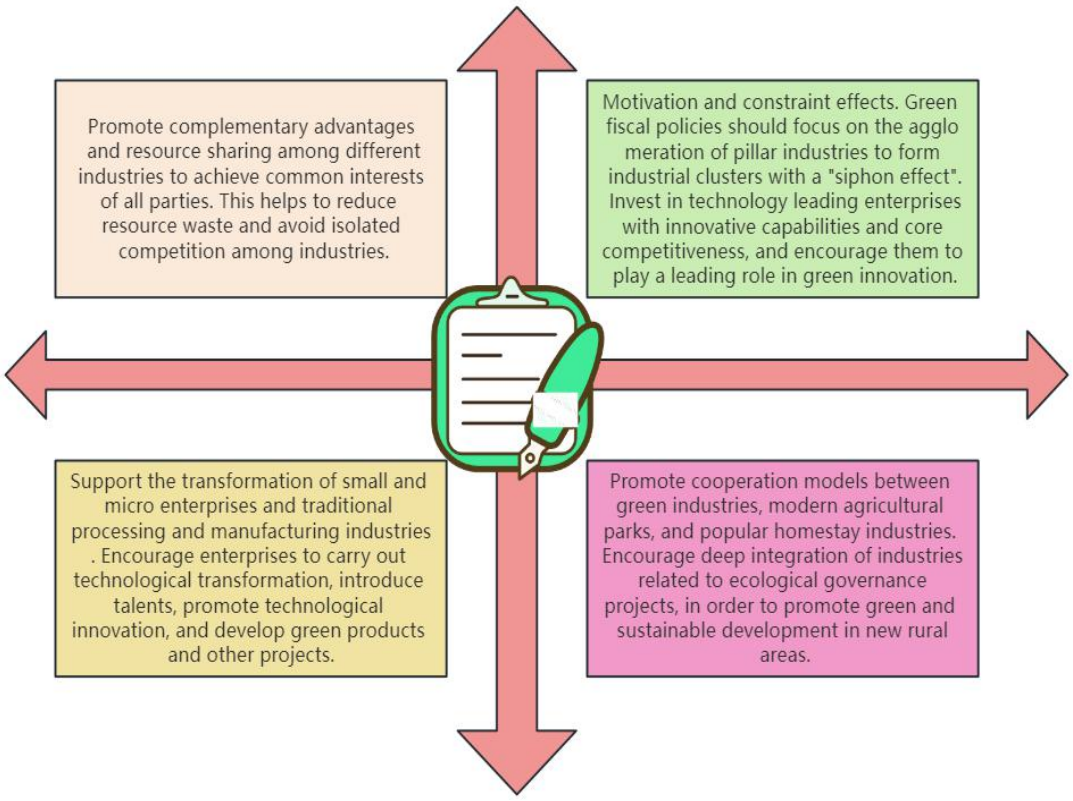

Figure 11. Collaborative Innovation between Green Finance and Industry

Table 6 shows how green fiscal policies affect Chinese business technical innovation, industrial structure, and microeconomic performance. Subsidies and tax advantages have boosted clean technology R&D and innovation. By encouraging firms to invest in creative ventures, these policies have advanced technology and business-research partnerships. A longer-range battery prototype was found in the electric car battery technology R&D subsidy case study and corporate R&D spending increased 20%. Industry tech innovation benefits from green fiscal policy. Green fiscal policies changed China's industry. Pollution fines and carbon emission trading have increased corporate green technologies. China's national carbon market transaction volume soared in 2023, indicating a greener sector and vigorous industrial restructuring. Chinese business is evolving due to green fiscal measures.

Green fiscal solutions benefit firms long-term but damage them short-term. Environmental rules like the 2023 clean coal technology investment cost upfront, but resource efficiency and pollution control save money over time. Companies save 15% by lowering water usage after paying for wastewater treatment facilities under the water pollution tax. Green fiscal policies' costs and benefits affect micro-economic performance, hence full information is needed. The table closes with green fiscal policies' effects on Chinese firms. These measures improved technical innovation, industrial restructuring, and micro-economic performance, indicating their sustainability [11].

Table 6. Impact of Green Fiscal Policy on Enterprise Performance

Aspect of Enterprise Performance	Potential Impact of Green Fiscal Policy	Company or Industry
Technical Innovation	Increased investment in R&D for clean technologies due to subsidies and tax breaks. Collaboration between enterprises and research institutions fostered by green fiscal programs.	Policy A: Subsidies for R&D of electric vehicle battery technology. (Positive impact) Case Study: Technical innovation companies increase R&D spending on battery tech by 20% in 2023 after receiving a green fiscal subsidy. This resulted in a successful prototype for a longer-range battery.
Industrial Structure	Shift towards cleaner industries due to pollution taxes and carbon emission trading schemes. Decline of heavily polluting industries due to stricter environmental regulations.	Policy B: Carbon emission trading scheme. (Positive impact) Case Study: China's national carbon market traded 212 million tons in 2023, a significant increase from 2022. This growth indicates a shift towards cleaner industries as companies adjust to the carbon trading scheme.

Aspect of Enterprise Performance	Potential Impact of Green Fiscal Policy	Company or Industry
Micro-Economic Performance	Short-term cost increases due to compliance with environmental regulations (e.g., RMB 193.7 billion in clean coal special re-lending in 2023). Long-term cost savings from resource efficiency and pollution prevention. Improved brand image and market access due to the adoption of green practices.	Policy C: Environmental tax on water pollution. (Mixed impact) Companies that (incur initial costs for environmental compliance but achieve long-term cost savings) incur initial costs for wastewater treatment technology in 2023 but reduce overall water usage by 15%, saving money in the long run.

Table 6 shows how green fiscal policies affect Chinese company's technical innovation, industrial structure, and micro-economic performance. Data demonstrates that these regulations help and damage firms nationwide. The table illustrates green fiscal policies stimulate industrial tech innovation. Clean technology R&D subsidies and tax advantages spur industry innovation. Electric car battery subsidies enhanced R&D by 20% and generated a longer-range prototype. Thus, green fiscal policies support innovation by boosting technology and business-research linkages. Additionally, green fiscal policies changed China's industry. Pollution fines and carbon emission trading have increased corporate green technologies. Growing transaction volume in China's carbon market improves sustainability. To promote sustainable growth, green fiscal policies are changing industrial structures. Green budgeting strategies hurt micro-economic performance; table demonstrates. Environmental regulations cost today but save resources and minimize pollution later. Companies save money by paying for wastewater treatment systems with the environmental tax on water pollution. Green fiscal policies help long-term but may cause short-term problems for enterprises that need careful management and planning.

5. Conclusion

As a core element of national governance, fiscal policy has become a common trend in the current global development environment, and green development has become a common trend. To effectively implement the country's clean development strategy, green fiscal policies have become indispensable. China's green fiscal policy system has made significant progress in long-term development and reform, including a series of fiscal incentives aimed at promoting environmental protection and sustainability. Although these policies may have a certain negative impact on the economic activities of enterprises to some extent, overall, they have had a significant positive effect on the sustainable development performance of enterprises. These policies encourage enterprises to adopt environmental protection measures to reduce resource waste and environmental pollution, while also encouraging technological innovation and improving their market competitiveness. Therefore, green fiscal policies play a positive role in promoting sustainable development, improving the ecological environment, and addressing resource and environmental challenges in China. The green fiscal policy implemented in China has achieved significant results, bringing positive impacts to the sustainable development performance of enterprises, and also helping to achieve the goals of high-quality economic development and environmental protection. Moreover, green fiscal policies have complex effects on Chinese corporate performance. These initiatives boosted technical innovation and industrial reorganization but hurt micro-economic performance. To grow sustainably, the Chinese government and businesses must work together to address these difficulties and employ green fiscal methods. Green fiscal policy boosts economic growth, sustainability, and competitiveness. Government green fiscal strategies can improve the environment and economy.

A. Research Implications

Politicians and companies may find clearer ways to improve this information in the recommendations. The government must develop industry-specific fiscal incentives. Examples: renewable energy R&D tax incentives or agriculture subsidies. A reliable regulatory framework that promotes green innovation and trust is crucial. This framework encourages carbon price, emission reduction, and green procurement. Businesses can adopt green technologies with government-sponsored capacity-building. Knowledge can be shared in workshops and venues. Public-private research, technical transfer, and co-investment help green innovation. Monitoring and evaluating green fiscal policy is essential. We can find and improve good policies.

Business needs green tech R&D. Possible R&D or research institutes. Corporate production and supply chain management should be green. Energy-efficient production, garbage minimization, and sustainable sourcing are examples. Companies must disclose sustainability activities to customers, suppliers, and investors. This can boost brand image and green consumer demand. Manage green innovation risks including technical and regulatory changes. R&D diversification and market monitoring may be needed. Finally, the long-term plan should include sustainability targets. Company-wide carbon reduction, resource efficiency, and waste management goals are possible. These projects must overcome high upfront costs, technological uncertainty, and regulatory complexity. Financial incentives, knowledge-sharing networks, and creative clusters can circumvent these constraints. These suggestions can help governments and businesses speed the sustainable economic transition and reap green innovation's economic benefits [8], [12].

B. Future Insights of Research

China's green fiscal and industrial policy must include tax cuts, subsidies, and government procurement to boost

renewable energy, sustainable transportation, and environmental rehabilitation. Innovation in green technologies comes from China. Fiscal efforts aid green traditional enterprises. Encourage existing industries to adopt cleaner processes, resource efficiency, and circular economy initiatives to increase environmental performance and competitiveness. Chinese environmental tax initiatives are another promising green fiscal option. Businesses pay carbon emissions, resource depletion, and waste to reduce their environmental impact and costs. Energy, technology, and infrastructure are funded by green taxes. Environmental taxes minimize pollution and encourage sustainability.

Big data and technology are vital for green fiscal planning. Big data and analytics enhance environmental enforcement. Real-time emissions, waste, and resource monitoring increase environmental compliance with targeted actions and sanctions. Tax incentives and subsidies affect a company's environmental performance, according to data. Performance-based thinking boosts green finance and sustainability. Green investment and financing may aid China's budget. Positive legislation and financing upgrades can support private sector green investments and the low-carbon economy. Green fiscal strategies reduce investment risk using guarantees, insurance, and risk-sharing. These plans can attract private investors to green projects with greater upfront costs but long-term environmental advantages, promoting sustainable development and economic prosperity. Chinese green fiscal measures require global cooperation. China may learn sustainable growth from other countries' green fiscal strategies. Sharing policy creation, implementation, and monitoring best practices strengthens China's green fiscal policies. International green project finance is enabled by the Carbon Pricing Leadership Coalition and other fiscal initiatives. This boosts China's green economy and worldwide environmental cooperation.

Examine these trends and future directions to improve China's green fiscal policy. The study says a green fiscal strategy would green China and the world. Sustainable growth requires industrial strategy, tax reforms, big data, technology, green funding, and international cooperation.

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