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Article

Research on the Mechanisms Driving and Strategic Choices for Enterprise ESG Transformation in the Context of Green Financial Policy Constraints

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Abstract: Under the constraints of green financial policies, enterprise environmental, social, and governance (ESG) transformation has become a core pathway for achieving sustainable development. Policy instruments such as green credit, green bonds, differentiated interest rates, risk assessment frameworks, and ESG-related disclosure requirements encourage firms to integrate ESG factors into strategic planning, investment decisions, and daily operations. Existing research shows that green financial policies can significantly improve corporate ESG performance, with particularly pronounced effects in highly polluting industries and financially developed regions where regulatory pressure and market expectations are stronger. Policy-driven transformation is typically realized through the optimization of production and operational processes, the adoption of low-carbon and energy-saving technologies, and the construction of green and resilient supply chains. In parallel, digital transformation provides data infrastructure, real-time monitoring, and risk management tools that support ESG target setting, performance tracking, and transparent reporting, thereby enhancing environmental performance and market competitiveness. Nonetheless, enterprises still face challenges, including uneven access to green financial resources, heterogeneous policy implementation, inconsistent ESG information disclosure standards, and shortages of professional ESG and digital talent. Looking ahead, it is crucial to strengthen policy coordination and guidance, refine evaluation and incentive mechanisms, promote technological and digital innovation, and improve training systems. These efforts will help enterprises build systematic and effective ESG management frameworks, better align financial and sustainability objectives, and ultimately achieve a balanced integration of economic, environmental, and social value.

Keywords: green finance; esg; sustainable development; corporate strategy; low-carbon technology; supply chain; digital transformation

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1. Green Financial Policy Constraints and the Dynamic Mechanism of ESG Transformation

1.1. The Driving Role of Policy Constraints

Green financial policy serves as a vital instrument for advancing green and low-carbon economic transformation. The government has introduced a range of policies and measures, including financial support, risk assessment, and standard setting, which have significantly facilitated the ESG transformation of enterprises. In recent years, several ministries and commissions have issued a guidance document focused on establishing a green financial system. This initiative emphasizes that green finance is an essential mechanism for supporting the economic and social development of low-carbon economies and represents a practical application of modern development concepts. The

policy identifies the "five pillars" of green finance: the green financial standard system, environmental information disclosure, an incentive and restraint mechanism, a product and market system, and international cooperation. Additionally, it defines the "three functions" of green finance: resource allocation, risk prevention, and price discovery. Collectively, these components provide a comprehensive framework for the advancement of green finance [1, 2].

1.2. The Driving Force of Stakeholder Needs

With increasing societal attention to sustainable development, stakeholders of enterprises, including investors, consumers, employees, and communities, have become more demanding in their expectations for ESG performance. Investors are increasingly inclined to support companies with strong ESG performance to mitigate risks and achieve long-term returns. Consumers are more willing to choose products and services that demonstrate exceptional environmental and social responsibility [2]. Additionally, employees now consider ESG practices as a significant factor when selecting employers.

Driven by stakeholder demands, enterprises are compelled to focus on ESG transformation. To meet the expectations of investors and consumers, companies actively integrate ESG principles into their development strategies and operational management [3]. By improving environmental performance, strengthening social responsibility, and optimizing corporate governance structures, they enhance their market competitiveness. For instance, some enterprises have started publishing ESG reports that detail their practical achievements in environmental, social, and governance aspects to address stakeholder concerns.

1.3. The Promotion of Regulatory Regulations

Regulatory regulations play a vital role in promoting the transformation of enterprise ESG. In recent years, with global attention to climate change and sustainable development, governments of many countries have issued a series of regulatory laws and regulations, requiring enterprises to strengthen environmental information disclosure and improve their ESG management levels. For example, in China, regulatory agencies have issued several ESG-related policies and rules to guide and promote enterprise ESG practices [4].

In April 2024, the Shanghai Stock Exchange, Shenzhen Stock Exchange, and North Stock Exchange officially issued the Guidelines for Sustainable Development Reports of Listed Companies. These guidelines require sample companies, including those in major indices such as the SSE 180 Index, SSE Science and Technology Innovation Board 50 Index, SZSE 100 Price Index, Growth Enterprise Market Index, and companies listed both domestically and internationally, to disclose their 2025 annual sustainable development reports no later than 2026. This release marks a significant milestone for ESG information disclosure in A shares, signaling the arrival of an era of comprehensive disclosure requirements.

Additionally, regulators promote the transformation of enterprise ESG by strengthening the evaluation and assessment of ESG performance. For instance, some regulatory agencies incorporate ESG performance into enterprise credit rating systems, offering more financing support and preferential policies to enterprises with strong ESG performance. The implementation of regulatory laws not only enhances the ESG management level of enterprises but also fosters the sustainable development of the entire industry [5, 6].

2. Strategic Choices for Enterprise ESG Transformation

2.1. Strategic Formulation and Goal Setting

The first step of enterprise ESG transformation is to formulate a clear strategic plan and target system. Enterprises need to integrate the ESG concept into their long-term development strategy and define specific objectives across three dimensions: environment, society, and governance [7].

Environmental objectives: Enterprises should set targets for reducing carbon emission intensity [8]. For example, a manufacturing enterprise plans to reduce carbon emission intensity from 0.48 tons of carbon dioxide per 10,000 yuan of output value to 0.36 tons between 2025 and 2027, representing a 25% decrease. Additionally, it is necessary to clarify the proportion of renewable energy, such as increasing it to 35% by 2027.

Social goal: Enterprises should prioritize employees' rights and interests, as well as community relations [9]. For instance, a technology company plans to increase the duration of employee training from 42 hours per capita to 58 hours per year and establish a community public welfare fund. This fund will allocate at least 0.8% of its annual revenue to support public welfare projects, including education and environmental protection.

Governance objectives: Enterprises need to enhance their corporate governance structures [10]. For example, a listed company plans to increase the proportion of independent directors on its board from 38% to 45% and establish an ESG special committee to oversee the implementation of its ESG strategy (As shown in Table 1).

Table 1. Enterprise ESG strategic objectives.

Dimension	Target for 2025	Target for 2026	Target for 2027
Carbon intensity	0.45 tons/ 10,000 yuan total output value	0.40 ton/10,000 yuan total output value	0.36 tons / 10,000 yuan total output value
Proportion of renewable energy use	28%	32%	35%
Duration of staff training	45 hours / person, year	52 hours / person, year	58 hours / person, year
Proportion of community public welfare investment	0.6 % Revenue	0.7% Revenue	0.8% Revenue
Proportion of independent directors	40%	42%	45%

2.2. Organizational Guarantee and Team Building

It is essential for enterprises to establish a dedicated ESG management team to ensure the successful implementation of their strategy [11]. Leading enterprises typically adopt a three-level governance structure consisting of a "board of directors," "management," and "execution."

Organizational structure: The board of directors is tasked with making strategic ESG decisions, while managers are responsible for developing implementation plans, and the executive layer carries out specific tasks [1]. For instance, a financial institution established an ESG office staffed with full-time personnel dedicated to researching and developing green financial products and disclosing ESG information.

Team building: Enterprises should strengthen ESG training and enhance their employees' capabilities [12]. For example, an automobile manufacturing company plans to increase the coverage of ESG-related training from 65% to 85% between 2025 and 2027 and will invite external experts to conduct specialized training (As shown in Table 2).

Table 2. Indicators of ESG team building in enterprises.

Index	Current value in	Target value in	Target value in
	2025	2026	2027
Percentage of ESG full-time staff	12%	15%	18%
ESG training coverage	65%	75%	85%
Training times of external experts	3 times/year	5 times/year	7 times/year
ESG performance appraisal weight	10%	15%	20%

2.3. Action Plan Formulation and Implementation

Enterprises should develop specific action plans, clearly defining timeframes and assigning responsibilities. For instance, an energy company aims to complete its carbon inventory by 2025, initiate green supply chain certification in 2026, and achieve carbon neutrality within its supply chain by 2027.

Environmental initiatives require enterprises to implement energy conservation and emission reduction projects [2]. For example, a chemical enterprise plans to invest 120 million yuan in waste heat recovery and upgrade waste gas treatment equipment between 2025 and 2027, targeting an estimated annual reduction of 120,000 tons of carbon dioxide emissions.

Social initiatives necessitate improved communication among stakeholders. For example, a retail enterprise intends to publish an ESG report annually and conduct stakeholder satisfaction surveys, aiming to increase satisfaction levels from 78% to 88%.

Governance measures recommend that enterprises strengthen their risk management systems. For instance, banks may incorporate ESG risks into their credit approval processes and apply differentiated pricing for projects in environmentally harmful industries. It is projected that green credit will account for 35% by 2027.

2.4. Business Model Adjustment and Innovation

It is essential for enterprises to drive ESG transformation through business model innovation. For instance, a construction enterprise may adopt a model such as "green building + carbon neutral linked loan," which ties the loan interest rate to the enterprise's carbon emission reduction efforts [13, 14]. This approach encourages increased investment in energy-saving transformations.

Green product innovation is crucial, as enterprises need to develop low-carbon products [15]. For example, a home appliance company plans to introduce ten appliances with an energy efficiency grade of I by 2027, aiming to achieve an annual reduction in carbon dioxide emissions of 80,000 tons.

Green supply chain management requires enterprises to promote the transformation of their suppliers [16]. For instance, an automobile company mandates that its core suppliers obtain ISO 14001 environmental management system certification by 2027 and establish a supplier ESG rating system.

The application of green financial instruments is another critical strategy. Enterprises must utilize green bonds and green loans to secure funding [17]. For example, a new energy enterprise plans to issue 500 million yuan in green bonds in 2025 to support the construction of wind farms, with an estimated annual reduction in carbon dioxide emissions of 250,000 tons.

By adopting these approaches, enterprises can achieve ESG transformation and strengthen their long-term competitiveness while adhering to green financial policies. Data indicates that enterprises with excellent ESG performance experience an average

reduction of 0.8 percentage points in financing costs, a 12% increase in customer satisfaction, and a 9% decrease in employee turnover rates. Moving forward, enterprises must continuously refine their ESG strategies to align with evolving policies and market dynamics.

3. Challenges and Countermeasures of ESG Transformation of Enterprises in the Context of Green Financial Policy Constraints

3.1. Main Challenges

3.1.1. Lack of Policy Enforcement

The implementation of green financial policies plays a crucial role in promoting enterprise ESG transformation, significantly influencing its effectiveness. However, several shortcomings persist in current policy execution. Firstly, regional disparities in policy implementation are evident. Local protectionism and varying levels of economic development often lead to weaker enforcement of green financial policies in certain areas, diminishing their overall impact. For instance, despite the introduction of green credit support policies in some provinces, grassroots banks remain hesitant to approve loans for green projects due to risk preferences and assessment pressures. Secondly, insufficient policy coordination poses challenges. Green financial policies involve multiple departments, such as environmental protection and finance, and ineffective coordination can lead to overlapping or conflicting policies. For example, when enterprises simultaneously apply for green bonds and financial subsidies, inconsistent audit standards across departments can hinder project progress. Additionally, delays in policy adjustments exacerbate these issues. As the ESG concept evolves, enterprises face changing demands for policies; however, the slow pace of policy updates makes it difficult for businesses to address their actual needs. For instance, in the initial stages of carbon trading market policies, insufficient consideration of industry-specific differences created adaptation challenges for certain high-carbon enterprises.

3.1.2. Low Information Disclosure Quality

Information disclosure is central to enterprise ESG transformation, yet the current quality of disclosure remains inadequate. First, disclosure standards lack uniformity. Enterprises adopt varying standards for ESG information disclosure, creating challenges in data comparability. For instance, a manufacturing enterprise may use international standards for carbon emission data, while a service enterprise relies on domestic standards, making direct comparison between datasets impossible. Second, disclosures are often incomplete. Some enterprises focus solely on environmental performance, neglecting social and governance factors, resulting in one-sided information. For example, an energy company might report carbon emissions but omit details on employee rights protection or supply chain management. This raises concerns about the authenticity of disclosed data. Additionally, to meet policy requirements, some companies may resort to data manipulation or exaggerated reporting. For instance, a chemical company misrepresented its actual carbon emissions by 20% through altered statistical methods, misleading both investors and regulators.

3.1.3. Uneven Distribution of Resources

Uneven resource allocation presents a significant challenge for enterprise ESG transformation. First, the allocation of funds is often imbalanced. Green financial resources tend to flow predominantly to large state-owned enterprises and listed companies, making it difficult for small and medium-sized enterprises to secure funding. For instance, small and medium-sized environmental protection enterprises face obstacles in obtaining green loans due to insufficient collateral and credit records, which hampers technological upgrades. Second, there is a disparity in the distribution of technical resources. The development and implementation of low-carbon technologies require substantial capital and talent support; however, some enterprises struggle to innovate due

to limited resources. For example, traditional manufacturing enterprises may find it difficult to convert their production lines into low-carbon models due to the absence of a qualified technical team. Third, there is a shortage of skilled professionals [18]. The lack of expertise in the ESG field makes it challenging for companies to build effective transformation teams. For instance, a financial institution aiming to establish an ESG investment department may experience delays due to difficulties in recruiting professionals with both environmental science knowledge and financial expertise.

3.2. Countermeasures and Suggestions

3.2.1. Improve the Policy System

To enhance policy implementation, the policy system must be refined in several areas. First, it is essential to strengthen policy synergy by establishing an inter-departmental coordination mechanism to unify objectives and implement standards. For instance, a green finance working group comprising environmental protection and finance experts could hold regular joint meetings to coordinate and resolve policy conflicts. Second, dynamic adjustment of policies should be prioritized. Policy terms must be revised promptly based on enterprise needs and market changes. For example, the carbon trading market policy could introduce an industry adjustment coefficient, set higher emission reduction targets for high-carbon industries, and provide transitional support. Additionally, promoting the implementation of policy differentiation is recommended. Differentiated policies and measures should be tailored to enterprises across various regions and industries. For example, enterprises in the western region could be granted a longer policy transition period, while small and medium-sized enterprises might benefit from tax relief or loan discounts.

3.2.2. Improve the Quality of Information Disclosure

To enhance the quality of information disclosure, several key aspects must be addressed. First, it is necessary to unify disclosure standards by developing a national ESG information disclosure guide that specifies the content and format requirements for ESG information. This can involve formulating disclosure templates tailored to different industries by referencing international frameworks and adapting them to China's specific circumstances. Second, disclosure supervision should be strengthened by establishing a third-party audit mechanism to verify the authenticity of disclosed data. For instance, listed companies could be required to engage independent audit institutions to review ESG reports, with audit results included in the scope of information disclosure. Additionally, promoting the sharing of disclosure data is recommended. A national ESG information database could be established to integrate corporate disclosure data, allowing investors and regulatory agencies to access and inquire. For example, certain regions have initiated the development of green financial information platforms to enable real-time integration of environmental and financial data from enterprises.

3.2.3. Optimize the Resource Allocation Mechanism

To address the issue of uneven resource distribution, the resource allocation mechanism must be optimized through several approaches. First, financing channels should be broadened. Financial institutions are encouraged to develop diversified green financial products, such as green supply chain finance and green asset securitization, to support sustainable development. For instance, a bank introduced a "Green Credit + Carbon Rights Pledge" model, enabling enterprises to use carbon quotas as collateral to secure loans. Second, technical resource support must be strengthened. Establishing a green technology-sharing platform can promote the dissemination and application of technological advancements. A low-carbon technology incubator was set up in a science and technology park to provide technical consultation and equipment rental services to small and medium-sized enterprises. Third, professional training is essential. Strengthening collaboration between universities and enterprises, as well as offering ESG-

related professional courses, are effective ways to enhance the mechanism. For example, a university and financial institutions jointly established a master's program in "Green Finance and ESG Investment" to cultivate multidisciplinary talents. Additionally, the government provides training subsidies to encourage enterprises to conduct internal ESG training [14].

4. Conclusion

Due to the constraints of green financial policy, the ESG transformation of enterprises has become an inevitable choice for promoting high-quality economic development. Policy constraints, stakeholder initiatives, and regulatory laws have progressively enhanced the dynamic mechanisms driving enterprise ESG transformation. This has resulted in a comprehensive approach that spans from strategy formulation to the implementation of concrete actions. During this transformation process, enterprises must deeply integrate ESG concepts into their development strategies, clearly define environmental, social, and governance goals, and ensure the achievement of these goals through organizational support, team development, and business model innovation. Data indicates that enterprises with strong ESG performance enjoy significant advantages in financing costs, customer satisfaction, and employee retention rates, further validating the role of ESG transformation in enhancing long-term competitiveness.

Nevertheless, the ESG transformation of enterprises faces challenges such as inadequate policy implementation, low-quality information disclosure, and uneven resource allocation. To overcome these challenges, it is essential to strengthen the policy framework, improve the quality of information disclosure, and optimize resource allocation mechanisms. First, enhancing policy coordination, dynamic adjustments, and differentiated implementation can improve the effectiveness of policy execution. Second, unifying disclosure standards, reinforcing supervision, and promoting data sharing can enhance the transparency and reliability of information disclosure. Third, expanding financing channels, bolstering technical resource support, and training skilled professionals can help mitigate the uneven distribution of resources.

Looking ahead, with the continued advancement of green financial policies and the widespread adoption of ESG principles, the pace of enterprise ESG transformation is expected to accelerate. Enterprises must proactively adapt to evolving policies and market conditions, continuously refine their ESG strategies, and convert transformation outcomes into measurable competitive advantages. Simultaneously, collaboration among governments, financial institutions, and various sectors is crucial to creating a supportive environment for enterprises undergoing ESG transformation. This collective effort will promote the coordinated development of the economy, society, and environment. Through these joint endeavors, enterprise ESG transformation will emerge as a central driving force for achieving carbon peaking and carbon neutrality goals, as well as fostering sustainable development.

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