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Research on the Impact of ESG Performance on Corporate Green Innovation

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Abstract: *Facing the severe challenges brought by global climate change, sustainable development has become a common consensus and pursuit goal in the international community. Against this backdrop, China actively advocates the new development concept of "innovation, coordination, green, openness, and sharing," and has clearly proposed the strategic goals of "carbon peak" and "carbon neutrality." As the main body of economic activities, corporate green innovation has gradually become a key factor in reducing environmental pollution, implementing the new development concept, and achieving the "dual carbon" goals. However, enterprises often face a series of challenges on the road to advancing green innovation, such as high research and development costs, uncertain market acceptance, and technological risks. ESG performance is gradually showing more important roles in enhancing corporate green and sustainable development competitiveness. This paper aims to explore the impact of ESG performance on green innovation and propose strategies to optimize ESG performance to promote corporate green innovation. By deeply analyzing the intrinsic connection between ESG performance and green innovation, it aims to jointly promote the global sustainable development process.*

Keywords: *ESG performance, green innovation, corporate sustainability, dual carbon goals, sustainable development*

1. Brief Overview of ESG Performance

1.1 Concept of ESG Performance

The concept of ESG performance originates from the extension and deepening of traditional financial performance evaluation standards. It was initially proposed by the United Nations Global Compact Organization, and through three dimensions—environmental protection, social responsibility, and corporate governance—it comprehensively reflects corporate responsibility investment and sustainable development practices[1-3]. Currently, although the definitions of ESG vary slightly across different international organizations, they all emphasize that enterprises should invest in the three dimensions of environment, society, and governance (see Table 1). The environmental dimension covers a company's contribution to environmental protection during its production and operational activities, effective environmental management strategies, and pollution reduction, which are key to corporate sustainable development. In this dimension, enterprises need to focus on resource use efficiency, greenhouse gas emissions, waste management, and ecological protection. The social dimension focuses on the relationships between the company and its employees, customers, suppliers, and other stakeholders. Corporate social responsibility includes providing a healthy and safe working environment, safeguarding labor rights, promoting employee diversity and inclusiveness, ensuring product safety, and actively participating in societal welfare[4-6]. The governance dimension emphasizes a company’s internal control structure and processes, such as organizational structure, decision-making procedures, and risk control systems. A good governance structure is critical to the company’s long-term performance and risk management, including ensuring diversity and independence on the board, establishing effective internal audit and risk management systems, and ensuring the transparency and accountability of corporate decision-making processes.

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Table 1: Key Areas of ESG Performance's Three Dimensions

Dimensions	Concerns
Surroundings	Resource usage efficiency
	Greenhouse gas emissions
	Waste management
	Ecological protection
Society	Healthy and safe working environment
	Protection of labor rights and interests
	Employee diversity and inclusion
	Product safety
	Community involvement and contribution
Governance	Diversity and independence of board members
	Internal audit and risk management systems
	Transparency and accountability in the decision-making process
	Business ethics and compliance

1.2 ESG Performance Evaluation System

With the growing global emphasis on sustainable development and corporate social responsibility, ESG performance has become an important standard for measuring a company's comprehensive strength and long-term value. Different ESG rating agencies typically establish indicator systems covering environmental, social, and governance dimensions, using unique evaluation systems and methods to comprehensively and objectively assess corporate ESG performance[7-8]. However, due to differences in evaluation methods and indicator selection, different agencies may give different assessments of the same company's ESG performance. Globally, ESG evaluation systems are mainly provided by agencies such as MSCI and Dow Jones, while China's ESG rating system is still in its infancy, with local rating agencies like Huazheng ESG Rating and Shanda Ronglv ESG Rating. Although China's ESG concept started later than in Western countries, in recent years, with policy promotion and market recognition, local ESG rating agencies in China are accelerating their development.

2. Brief Discussion on Green Innovation

2.1 Concept of Green Innovation

Green innovation has become a hot topic in academic research, though its definition has not yet reached a consensus. Green innovation is also known as environmental innovation, ecological innovation, or sustainable innovation. These terms are interchangeable in research. Green technology innovation refers to all processes, technologies, and products that can reduce environmental pollution and waste of raw materials[9-11]. Additionally, green innovation refers to innovations aimed at reducing environmental pollutant emissions during the production process and reducing the environmental burden of enterprises, including ideas that contribute to promoting corporate sustainable development. Green innovation relates to innovations associated with green products or processes, specifically including technological innovations related to resource conservation, pollution reduction, green product design, or corporate environmental management, aimed at reducing pollutant generation and emissions. Green innovation emphasizes new ideas, processes, and management practices to reduce corporate environmental burdens.

2.2 Factors Influencing Green Innovation

The main factors influencing green innovation can be divided into two categories: internal factors and external factors (see Figure 1).

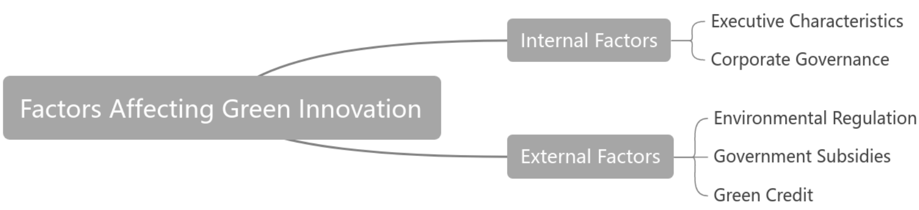

Figure 1: Factors Affecting Green Innovation

Internal Factors

From an internal perspective, these include executive characteristics and corporate governance. If a company’s managers have an environmental background, its green innovation can be significantly promoted, and there is a clear correlation between these two indicators. Specifically, for enterprises that are non-state-owned, not highly polluting, or not deeply marketized, the CEO’s environmental background can show significant benefits in promoting green innovation. Additionally, the green innovation ability of a company is closely related to the attention given by its senior management team, and their interest in environmental issues positively drives the company's green innovation strategy[12-13]. Senior management's environmental awareness can be classified as either opportunistic or responsible, and both types of awareness have a clear promoting effect on the company’s green innovation and can further enhance the company’s performance. Furthermore, the green innovation capability of a company is positively correlated with the educational background of its executives—i.e., the higher the education level, the stronger the innovation capability.

In the process of advancing green innovation, the role of corporate governance should not be overlooked. A company’s innovation plan is not isolated but deeply rooted in the company’s governance system. The governance approach can effectively alleviate management’s short-term thinking, thereby promoting the company’s move toward green innovation. To improve governance, activities such as group evaluations, separation of powers, and performance assessments can be used to increase the company’s innovation output, significantly enhancing its innovation performance and injecting strong momentum into its long-term development.

External Factors

External factors primarily include environmental regulation, government subsidies, green credit, and others, which together influence green innovation. In today’s society, environmental management has become an indispensable part of corporate operations. Proper environmental management measures can improve environmental quality and bring additional economic benefits, achieving a win-win situation for both environmental protection and business operations. Proper environmental regulations can have a positive effect on promoting green innovation, which arises from two aspects. On the one hand, there is external pressure: Green progress is a real demand for companies and their stakeholders, particularly for heavily polluting industries. If a company faces environmental challenges, its investment risks will significantly increase. This means that heavily polluting enterprises will struggle to attract or retain high-quality professionals, potentially damaging their public image. Facing this external pressure, companies may be more inclined to innovate green technologies[14]. On the other hand, through green innovation, enterprises can gain unique green competitive advantages. With the push of environmental regulations, management teams are more likely to move towards green innovation to achieve corporate sustainable development.

3. The Impact of ESG Performance on Green Innovation

3.1 Creating a Relaxed Financing Environment

In the context of global sustainable development, the concept of ESG (Environmental, Social, and Governance) is gradually becoming an important consideration in corporate development. The promotion of this concept encourages enterprises to reassess their complex relationships with stakeholders and, on a deeper level, guides a transformation in corporate behavior patterns. By actively implementing ESG practices, companies can signal their commitment to sustainable development to the outside world. This helps build a positive corporate image, reduce information asymmetry, and present stakeholders with the company's performance in the areas of environment, society, and governance. This, in turn, reduces the

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investment risks for stakeholders and increases the likelihood of external collaborations, which ultimately eases the company's financing pressure.

Furthermore, ESG performance has become an essential choice for companies in strategic decision-making to respond to stakeholders’ demands. At present, the growing societal emphasis on ESG prompts companies to recognize external green demands and meet stakeholders' green expectations through their own technological accumulation and strategic positioning. Therefore, companies with strong ESG performance are more easily recognized and perceived by stakeholders. Governments are more likely to establish stronger political connections with companies that actively fulfill their social responsibilities. With the support of stakeholders such as the government and investors, companies can secure more key resources, such as fiscal subsidies and green credit, which create a more relaxed financing environment and provide strong support for green innovation.

3.2 Improving Corporate Governance

As green and low-carbon transformation and sustainable development advance, stakeholders are increasingly focusing on non-financial performance and incorporating ESG into their evaluation criteria for corporate value. This shift in focus requires companies to prioritize both economic and social benefits, which in turn has led to growing external oversight of corporate management. ESG not only concerns corporate social responsibility and sustainable development but also plays an important role in improving governance levels and reinforcing supervisory mechanisms[15-16]. Therefore, ESG performance can enhance governance levels and activate supervisory mechanisms, pressuring companies to engage in green innovation.

In practice, the growing market attention to ESG gradually establishes external regulation of corporate management, and this strengthened oversight effectively curbs opportunistic motivations of managers, suppressing short-term behaviors. This forces companies to improve green innovation efficiency through green transformation. From another perspective, good ESG performance indicates that a company has a better strategic plan, superior governance structure, and improved operational outcomes, which can encourage the company to strengthen internal controls, optimize governance, reduce agency costs, and minimize the likelihood of agency problems. In the future, companies should actively practice ESG principles, invest more in environmental governance, social responsibility, and corporate governance, and continuously improve their ESG performance to adapt to the global trend of green and low-carbon transformation.

4. Strategies for Optimizing ESG Performance to Promote Green Innovation

4.1 Government Establishing an ESG Rating System

Currently, the ESG concept is gradually becoming an important standard for measuring corporate sustainability globally. However, in China, the ESG rating system and its application are still in the early stages. While ESG is receiving increasing attention, there is no unified, locally applicable ESG rating system, making it difficult for the market to assess the actual situation of companies and affecting the reliability of ESG information. Therefore, the government should, based on international experiences and in line with China's national conditions and development stages, establish an ESG evaluation system with Chinese characteristics (see Figure 2). This should include environmental protection regulations, social welfare policies, and corporate governance standards, improving the credibility of ESG information, standardizing ESG disclosure, and encouraging greater market attention to ESG, thus promoting sustainable corporate development.

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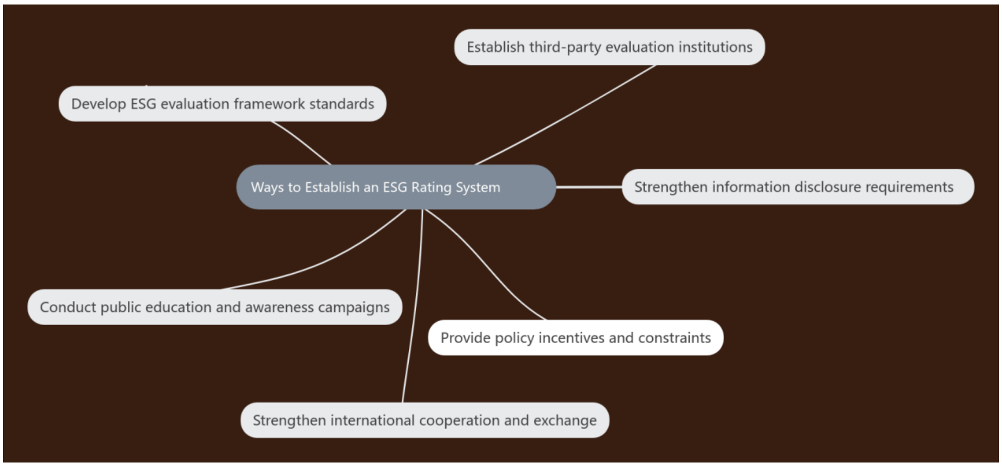

Figure 2: Ways to Establish an ESG Rating System

4.2 Companies Setting Clear Development Goals

Amid the intensifying challenges of climate change and resource constraints, companies must integrate ESG principles into their strategic decisions and corporate governance, actively exploring green and sustainable development paths. Enhancing awareness of green innovation helps companies address environmental challenges, facilitating their transformation and upgrading toward green development. Companies can learn from the successful experiences and practices of other companies, adapt them to their own business features and industry attributes, and develop ESG strategies that align with their development needs. Additionally, establishing an ESG organizational structure to guide the planning and implementation of ESG practices is crucial. Companies should form ESG management committees, creating a cross-departmental and cross-functional coordination mechanism, clearly defining responsibilities and authority at each management level, setting clear execution standards for each task, avoiding overlap and conflict, and improving the efficiency and quality of ESG work.

5. Conclusion

In conclusion, ESG performance and green innovation are closely related. Through strong ESG performance, companies can create a favorable financing environment, further enhance governance levels, and provide a foundation for achieving green innovation and meeting future sustainability needs. In the future, companies should place greater emphasis on improving their ESG performance, integrate it into their long-term strategic plans, and create a positive external environment for green innovation.

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