

The impact of green innovation on organizational resilience

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Abstract: Organizational resilience can help an enterprise to recover quickly in the crisis, and even achieve growth against the trend, which is crucial for an enterprise. From the perspective of green innovation, this paper selects Shougang Group, BAIC Group and BOE Group as research samples for case analysis. This paper summarizes the following conclusions: green innovation can promote the sustainable development of enterprises, which is the external recognition and support of enterprises, thus enhancing the resilience of the organization. And give some suggestions: 1) Enterprises should be firmly determined to green innovation, and dare to try according to the actual situation of enterprises. 2) Enterprises should work together to grow together, and help to green innovation and digital transformation and upgrading. 3) Actively cooperate with relevant departments to promote the green development of enterprises.

Keywords: green innovation; organizational resilience; sustainable development

1. Introduction

In recent years, with the widespread spread of green and green mountains as gold and silver mountains, the Party and the state have constantly emphasized to accelerate the green transformation of the development mode and promote the green economic and social development. It has attracted wide attention to the development of green innovation from all walks of life. Many companies have made an attempt, but met the increasingly frequent public crisis, some green innovation enterprise walked out from the crisis, the former vitality, but also there are many failed to survive the crisis, formed a stark contrast, there are a lot of research on green innovation and organization toughness, but about the mutual relationship and mechanism of action but few people mentioned. Therefore, this paper selects the representative enterprises of domestic green innovation for research. Focus on whether green innovation can enhance organizational resilience, and how the mechanism of action works.

2. Literature review

2.1 Organizational toughness

Organizational resilience can help enterprises overcome difficulties, and at the same time achieve continuous growth, turning crisis into "opportunity"^[1]. Organizational resilience has always been the ability to build for sustainable development of enterprises. Meyer^[2] has made a breakthrough in applying the concept of resilience to business and management research and defining it. Existing research on organizational resilience can be roughly summarized into five aspects: the organization's response to external threats, organizational reliability, employee advantage, business model adaptability, and resilient supply chain design.

The study has found that organizational resilience has a positive impact on businesses. Organizational resilience can promote the transformation and upgrading of enterprises. Wang Yu and others^[3] found that the stronger the organizational resilience, the more obvious the improvement of the competitiveness of enterprises, and organizational resilience plays a certain role in promoting the positive correlation between the digital transformation of enterprises and enterprise competitiveness. Zhang Yu^[4] believes that the value creation dimension, value realization dimension and value transmission dimension of the business model all have a positive impact on the resilience of enterprise organizations. Xu Xinhang^[5] believes that under the crisis, organizational resilience has a significant positive impact on financial performance. Organizational resilience also has different effects in different periods. For small and medium-sized enterprises, different resilience abilities have different

effects in different stages of environmental mutation. In the early stage of environmental mutation, resource resilience and institutional resilience are the important protective factors for small and medium-sized manufacturing enterprises; in the middle stage of environmental mutation, awareness resilience and relationship resilience gradually return to the initial balance state; in the later stage of environmental mutation, strategic resilience is placed in an important position, promoting enterprises to seize the growth opportunity and step up to a new development level.^[6]

There are many factors that affect organizational resilience. For large enterprises with global competitiveness, their organizational resilience depends on the ability to identify risks when they sprout.^[7] For small businesses, organizational resilience is highly dependent on the company's management and staff team. And digital transformation can help build organizational resilience through connectivity, aggregation, and screening.^[8] Chen Hongchuan and others have found that innovative management can enhance the competitiveness of enterprises by enhancing organizational resilience. To build organizational resilience, we can start with organizational resources, organizational leadership, organizational learning, and social relationship networks. At the same time, government audit and high-quality internal control can also effectively improve organizational resilience.

2.2 Green innovation

Green innovation can improve the quality of ecological and environmental development. Some studies believe that there is an inherent conflict between environmental protection and performance, and the measures of environmental protection taken by enterprises will occupy the means of production and reduce the production efficiency. The Porter hypothesis holds that reasonable environmental regulation can stimulate the "compensation effect", which can not only make up for the cost of environmental protection, but also stimulate innovation and improve production efficiency. Since the above scholars did not take the impact of green innovation into consideration when conducting relevant research, in fact, from a macro perspective, green innovation can not only solve the problem of environmental pollution, but also promote economic development.

From the perspective of enterprise performance, Wang Jianming et al. found that green innovation plays a complete intermediary role between enterprise performance and environmental constraints, and green innovation has a positive impact on enterprise performance. Ye Hongyu and others have found that green innovation will increase the cost of enterprises in the short term, but in the long term, it can promote the performance development of enterprises. Zhang Gang and others found that green innovation can not only strengthen their financial performance, but also strengthen their social performance. From the perspective of enterprise competitiveness, corporate environmental responsibility and enterprise environmental ethics have a positive effect on the competitiveness of enterprises, while green innovation, as an intermediary role between the two, strengthens the competitiveness of enterprises.

At present, there is still insufficient research on the impact of green innovation on corporate organizational resilience in China. This paper will take Shougang Group, BAIC Group and BOE Group as research samples to analyze the impact of green innovation on organizational resilience through multiple case studies.

3. Case presentation

China's economy is currently in a transition period from high-speed growth to high-quality growth model, and innovation-driven development has become the core engine of development. Among them, green innovation has received wide attention and attention from the government and all sectors of society because of its dual value of environmental friendliness and economic benefit promotion. At the same time, with the rise of the concept that clear waters and green mountains are golden mountains of gold and silver, the proposal of relevant policies has also accelerated the development process of ecological civilization construction and promoted the green development of industry.

In this critical period, the local enterprises represented by Shougang, BAIC and BOE Technology implement the policy content and adhere to green innovation, which not only makes the enterprise make a breakthrough in business performance, but also makes the enterprise show super resilience.

This paper selects BAIC Group, Shougang Group and BOE Group as representative enterprises for the following reasons:

The research topic of this paper is the research on enterprise resilience of green innovation, so the research object should have the ability of green innovation, and can reflect the organizational resilience from its actions or financial data. The first goal of the research is enterprises in the manufacturing or happy technology industry.

BAIC Group, Shougang Group and BOE Group are all relatively leading manufacturing enterprises in China, which have more research value than other small, medium and micro enterprises. As a listed company, its financial data is more transparent, and it also pays more attention to the information disclosure of all aspects, which is very helpful for the smooth progress of the research.

BAIC Group, Shougang Group and BOE Group are all listed companies, and the driving effect of their behavior is continuous and huge, and we can better observe the influence of the independent variables on the dependent variables in this paper.

BAIC Group, Shougang Group and BOE Group have all developed well and made some achievements during the public health events. This paper believes that one manifestation of the strong organizational resilience is to grow against the trend in an unstable environment and even lend a helping hand to other parties. The above groups meet the exploration standards of this paper.

3.1 Green innovation to help BAIC Group overcome the difficulties

Beijing Automotive Group Co., Ltd. (hereinafter referred to as "BAIC Group") is a backbone enterprise in China's automobile industry. Its industrial chain covers vehicle and parts research and development and manufacturing, automobile service trade, comprehensive travel services, finance and investment and other businesses. It is a 124th large enterprise group in the world's top 500 companies. In recent years, in order to accelerate the construction of ecological civilization, promote the development of industrial green, actively implement the national "carbon peak, carbon neutral" strategy, Beijing auto group has been committed to strengthening green science and technology innovation, and play a leading role in the development of industrial green technology innovation, make it become one of the outstanding representative enterprise of green innovation.

In the context of global warming and intensified environmental pollution, BAIC Group sticks to the original aspiration to dig deep into green value, according to the needs of green manufacturing industry, strengthen the research and development of product green core key technologies, and built a technology system to support the development of green manufacturing industry. At the same time, linkage with subordinate enterprises at all levels, giving play to the advantages of resource integration, successfully established the prototype of the whole system energy conservation and environmental protection work system. In addition, BAIC Group has also created classified green factories, completed the construction of 12 national green factories in just three years, and won the title of "National Green Factory" awarded by the Ministry of Industry and Information Technology. Group's Beijing blue valley as the pioneer of auto industry low carbon emissions, deep pure electric vehicles, established the product life cycle of green management system, further enhance the resource utilization efficiency, and the transformation and upgrading of the auto industry, green low carbon transportation and the implementation of the "carbon peak" and "carbon neutral" target support, make it in 2019, the ministry published "industrial products green design demonstration enterprise" list. The years of persistence and continuous attempts, BAIC Group have made it a model of green innovation in the automobile industry, which has left a deep impression on the government and the public, and accumulated a good social reputation and moral resources, which has laid a solid foundation for the resilience construction and enhancement of BAIC Group.

In recent years, with the major public health events strongly affecting the market environment, enterprises have been affected to varying degrees, and even many enterprises have failed to get out of this crisis, but BAIC Group has successfully and quickly passed this tough period by relying on its super organizational resilience. In terms of revenue data, the profit growth rate of BAIC Group in 2021 reached 10.34%, and the profit in 2022 also increased by 4.7% year-on-year. In addition, BAIC Group accelerates the pace of exploring the southern China market and deepens the opening-up and cooperation. By September 2022, BAIC star products have been sold in more than 110 countries and regions around the world, and officially registered in South Africa in November, becoming a model project of China-South Africa cooperation. It can be seen that BAIC Group has gradually stepped out of the impact and impact of public health events. Compared with other ones affected by public health events, its rapid recovery and restart and return to the normal development path, once again shows the strong organizational resilience of BAIC Group.

Adhere to the practice of green innovation development concept, technological innovation, and fulfill corporate social responsibility, so that BAIC Group can calmly encounter the impact, quickly restore the vitality and vitality of the group, and return to the normal development path. It has also made BAIC Group become one of the model enterprises of green innovation in the domestic automobile manufacturing industry, providing new ideas and new methods for other enterprises to build organizational resilience.

3.2 Green innovation, New Oriental faces the challenge of strong transformation

Founded in April 1993, BOE Technology Group Co., LTD. (BOE) is an innovative enterprise of the Internet of Things with semiconductor display as the core, providing intelligent port products and professional services for information interaction and human health. BOE as the head of IoT enterprise in China and the world, adhering to the "science and technology lead, product excellence, symbiosis, to human text" principle, actively explore science and technology, accumulated independent patent application for more than seventy thousand, in today's world, on average of every four intelligent display terminal has 1 display from BOE. As a highly influential Chinese enterprise in the world, BOE sets an example and actively echoing that enterprises should take the initiative to assume social responsibilities and jointly create a beautiful environment for green, healthy and sustainable development.

In the context of severe global climate change, BOE has actively responded through green innovation. According to the 2021 BOE corporate Social Responsibility annual report, BOE actively responds to the national policy, attaches great importance to the work of "carbon peak, carbon neutral", and establishes the "double carbon" project team, which not only effectively practices the concept of green and low-carbon development, but also continuously promotes carbon neutral pilot projects, use clean energy and other measures to reduce carbon emissions. This positive response was strongly supported by the employees, and the internal momentum became stronger. BOE uses the self-developed photovoltaic power station operation and maintenance system to conduct all-weather, intelligent and unmanned monitoring of the photovoltaic power station to ensure the stable and efficient operation of the power station. Its excellent performance also plays an important role in the green power guarantee work of Beijing winter ice and snow events. BOE has also made great achievements in resource recycling and utilization. With its advanced wastewater recovery system to improve the utilization rate of wastewater and promotes the zero discharge of waste acid and the effective reduction of waste substances with various self-utilization transformation projects. Therefore, it has won the title of "Beijing Advanced Collective for Water Conservation". As an enterprise with great innovation ability and green environmental protection awareness, BOE also runs the green concept throughout the whole life cycle of production, saving resources, protecting the environment and reducing pollution through green technological transformation, clean production, green building and other ways.

During the outbreak of major public health events, BOE has shown strong resilience despite its difficulties and challenges. According to the BOE 2022 semi-annual report, BOE in the five mainstream applications LCD market share in the world, notebook display market share in the world, also created the trend during the public health events, for the first time the car market share of the world's first, and in the field of high definition, high refresh rate, flexible in areas such as innovation, a new high. Jingdong Internet innovation enterprise continuously achieve more segmentation application scenarios, sensor business in the first half of the sequencing chip product sales rose 121% year on year, constantly make up for the wisdom window, wisdom medical market blank, during the economic environment turmoil still have the good ability to develop the market is also a big reflection of BOE strong toughness. BOE's green innovation concept has long been running through the company's business, so it has been recognized by the world. The promotion of green technology again and again reflects the attitude of actively fulfilling corporate social responsibility, and the rapid development during public health events has shown the style and strong resilience of Chinese big enterprises to a considerable extent. Thus to obtain the recognition of the market. It is believed that under the guidance of green innovation, BOE can accelerate the integration and symbiosis of the new generation of information technology and the real economy, comprehensively improve the organizational resilience, comprehensively empower the development of China's digital economy from the three dimensions of technology, intelligent manufacturing and ecology, and create the legend of resilience.

3.3 Green innovation and promote the high-quality development of Shougang

Since the eighteenth congress, Shougang group seriously implement the Xi ecological civilization

thought, comprehensive practice of "green water castle peak is the jinshan yinshan" concept, in-depth implementation of Beijing, Hebei and other territorial government carbon reduction work requirements, within the scope of the group unified deployment, the full implementation of ecological civilization construction work, to continue to implement the "green action plan" as the carrier, carry out environmental protection work, pushing green low carbon development, has achieved remarkable results. After several years of efforts, the green development capacity of Shougang Group has been comprehensively and systematically improved, laying a solid foundation for the high-quality development of the enterprise. At the same time, it should closely follow the national requirements of ecological civilization construction, actively fulfill the social responsibilities of state-owned enterprises, comprehensively and jointly promote the ecological and environmental protection work, and achieve green and sustainable development.

While focusing on the prevention and control of public health incidents, Shougang Group has coordinated the production, operation and construction work, and is committed to promoting green innovation and sustainable development in its operation and development. By the first quarter of 2022, 6 units of Shougang Group have been rated as national green factories, 3 mines have become national green mines, and 3 units have been rated as Class A enterprises of environmental credit. Shougang Group has promoted sustainable development by recycling and recycling waste and other resources, and provided active support for the realization of green and low-carbon development for the 2022 Beijing Winter Olympics. Shougang Group adopts new technologies and innovative ways to reduce the environmental impact of its production process and to improve its production efficiency and quality. This helps to improve the innovation capacity and resilience of an organization to better adapt to the changing market and technology environment. In the main steel industry, 75% of the steel production capacity has achieved ultra-low emissions, among which moving steel and Jingtang 2 enterprises continue to maintain environmental protection A-class performance. Shougang Group has improved its production efficiency and sustainability by reducing emissions and saving energy in its production process. This not only reduces the internal cost of the organization, but also reduces the demand for natural resources, at the same time enhance the enterprise toughness, improve the social status, obtained the external support, enable it can better cope with the risk of resource shortage and supply chain interruption, at the same time by the use of new technology and innovation, in order to reduce its impact on the environment in the production process, and improve its production efficiency and quality.

Shougang Group's green innovation not only helps to reduce costs, improve production efficiency and quality, but also enhances its resilience, enabling it to better respond to external shocks and market changes, so as to achieve sustainable development.

4. Mechanism of action

Enterprises can obtain their own internal promotion through green innovation, mainly including green practices of resource recycling, emission reduction and electricity production to promote their sustainable development, but also can obtain external recognition and support. Green innovation behavior can obtain government support, improve their status in the hearts of consumers, improve the cooperation willingness of all parties in the society, and establish a good corporate image. Green innovation brings internal and external improvement to the enterprise, and then obtains better performance.

5. Summary and revelation

The party's 20th annual report stressed that accelerating the green transformation of the development model and promoting green and low-carbon economic and social development are the key links in achieving high-quality development. In the era of innovation-led development, the concept of green innovation was born, which all sectors of society have responded to. With years of efforts and persistence, the enterprises, represented by Shougang, BAIC and BOE, have successfully transformed and upgraded, established strong organizational resilience and resisted the impact, and have become the model of many enterprises.

5.1 Summary

Green innovation is conducive to enhancing organizational resilience. Through green innovation,

enterprises can further promote the sustainable development of enterprises, and the recognition of external stakeholders can be further obtained in the practice process, and then can obtain certain benefit support. In this way, when the enterprise is facing the impact, it has strong confidence and strong ability to resist the impact and return to the normal development path, which is also a manifestation of the enhanced resilience of the organization.

5.2 Revelation

5.2.1 Enterprises should be firm in green innovation and have the courage to try according to their actual situation.

In recent years, with the birth of the concept of carbon neutrality and the rise of the transformation of digital economy, relevant national policies have been introduced one after another. At this critical moment, many enterprises are faced with various choices for further development, so they need to carefully analyze and make decisions according to their own situation. Enterprises can see such era development trend, more important is the enterprise should improve green innovation will, green innovation determination, can have no idea not to do, or limited to the short-term interests gain and loss without enough research and development and investment, but enough firm to look in the long run, so can truly realize industrial upgrading, meet the requirements of the policy and era to improve the enterprise's competitive advantage and toughness. Enterprises can actively try to sum up experience from successful cases and apply it in combination with their own actual situation, but also pay attention to the scientificity and feasibility of green innovation research and development, and avoid blind investment in research and development.

5.2.2 Enterprises should work together to grow together, and help to green innovation and digital transformation and upgrading.

In the face of emergencies, enterprises and enterprises are both competitors and partners. In the era of public health events, many enterprises are in difficult times, when the survival of enterprises depends to some extent on mutual solidarity and cooperation. Green innovation in the form of collaboration reduces the time and resource costs of independent development, and also enhances their resilience to form a highly resilient group. When faced with the impact, the super resistance ability of the whole group will form a favorable counterattack, which will also create a better growth environment for every enterprise, so that the enterprise will continue to carry out the practice of green innovation and digital transformation.

5.2.3 Relevant departments should actively cooperate to promote the green development of enterprises

The three enterprises involved in this paper are all registered in Beijing, where the system is relatively sound. Moreover, the research of Zheng Jiarong et al. found that environmental regulation has a significant positive impact on enterprise green innovation, and the incentive environmental regulation is promoting stronger. Therefore, the external environment affects the green innovation willingness and ability of enterprises. In order to give full play to the supervision and guiding role of third parties, financial institutions can increase investment in environmental protection projects to ease the financing constraints of early green innovation. In the short term, the government can formulate reasonable compulsory measures to raise the awareness of green development. In the long term, the government provides certain subsidies to green R & D enterprises and optimizes relevant systems to encourage green innovation.

6. Conclusion

Green innovation is the inexhaustible driving force for enterprise development. There are many enterprises that have realized transformation and development through green innovation. Green innovation will not see immediate results, but in the long term, green innovation can enhance the organizational resilience of enterprises, and become one of the key factors for enterprises to "grow against the trend". Enterprises should make long-term plans as far as possible when considering their own actual conditions. At the same time, local governments should establish a sound environmental regulation system to encourage enterprises to carry out green innovation.

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