Research on the Green Transformation Path of Private Enterprises under the Perspective of High-Quality Development

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Abstract: Using the Analytic Hierarchy Process, this study researches on the green transformation path of private enterprises under the vision of high-quality development. Combined with the green transformation achievements of private enterprise BYD, the driving factors of green transformation for private enterprises are analyzed, and the following conclusions are drawn: (1) In terms of comprehensive evaluation, the weights of driving factors are ranked as follows: enterprise level, customer level, and government level guarantee, and internal factors of enterprise are the key to green transformation. (2) From the perspective of driving factors, the government is more concerned about the green technological innovation capability of private enterprises, while enterprises focus on the intensity of market response, and consumers pay attention to brand influence. (3) According to the ranking of weights, it indicates that consumer satisfaction, market response, technological innovation, capital investment, entrepreneurial ethics, and other major factors play a significant role in the low-carbon coordinated development of urban transportation in the Greater Bay Area. Finally, from the perspective of the target of high-quality development of private enterprises, it is suggested to make efforts in eight aspects including national policies, financial support, and corporate culture to achieve the green transformation of private enterprises.

Keywords: High-quality development, Private enterprise, Green transformation, Path research.

1. Introduction

High-quality development refers to pursuing economic growth while focusing on improving quality and efficiency in economic and social development, aiming to achieve sustainable development goals. High-quality development emphasizes innovation-driven [1]. Under the traditional economic growth model, relying on resource input and scale expansion to achieve economic growth has become unsustainable. High-quality development requires promoting economic growth through technological innovation, technological progress, and other means, while enhancing the quality and value-added of products and services. High-quality development emphasizes green development [2]. In the face of increasing resource and environmental pressures, economic development must be coordinated with environmental protection. High-quality development requires enterprises to adopt green production methods and reduce negative impacts on the environment while pursuing economic benefits. High-quality development emphasizes the well-being of the people. The ultimate goal of economic development is to improve people's living standards. High-quality development requires economic growth not only to focus on numerical growth but also to pay attention to the people's sense of employment, income levels, and other aspects of well-being. Lastly, high-quality development emphasizes comprehensive coordination and sustainability. Economic development must consider multiple factors such as society and the environment to achieve the coordinated development of the economy, society, and environment, and to achieve sustainable development goals.

During the process of achieving high-quality development, the green economy transformation is considered an important way to promote economic transformation, upgrading, and enhance competitiveness [3]. Influenced by internal factors such as the aftermath of the pandemic, the collapse of the real estate industry, as well as external environmental impacts such as the Russia-Ukraine war and the continuous interest rate hikes by the US Federal Reserve, China's economy faces unprecedented downward pressure in 2023. The UN's Mid-term Report on World Economic Situation and Prospects for 2023 shows that China's economy is expected to accelerate to 4.8% in 2023, which is significantly lower than the 6% to 6.5% growth rate before the COVID-19 pandemic. Under such circumstances, high-quality development is bound to become one of the core guiding ideologies for China's future economic and social development. Looking back at the past three years, especially since 2023, Chinese private enterprises have performed outstandingly, especially those that have transformed early into green development. They have benefited more from participating in domestic and international market competition, such as private enterprises like BYD, BGI, Huawei, JD.com, Meituan, etc. Green transformation has become an important path for private enterprises to achieve high-quality development, attracting widespread attention and recognition. Private enterprises, as an important part of China's economic development, have significant theoretical and practical implications for studying the green transformation paths of private enterprises. However, considering the current development status of green transformation in Chinese private enterprises, the pressures and challenges they face are becoming increasingly apparent.

Currently, domestic and foreign scholars have focused their research on green technological innovation when it comes to corporate green transformation, mainly focusing on the driving factors [4] and the contents of green innovation [5]. A review of relevant research literature reveals a lack of research on the green transformation of private enterprises,
and most of the existing studies are based on different research perspectives [6-7]. In terms of research content, there is a lack of research based on the perspective of high-quality development. In terms of research methods, there are more quantitative and qualitative analyses, but there is a lack of research on the green transformation and upgrading paths based on case studies of private enterprises, and research literature specifically exploring the specific paths of green innovation transformation and upgrading for private enterprises based on the perspective of high-quality development is extremely scarce. Therefore, this paper takes the green transformation and upgrading process of BYD in Shenzhen as the research object, aiming to explore and study the construction of a specific path for green innovation transformation and upgrading of private enterprises based on the perspective of high-quality development.

2. Research Method

The text uses the Analytic Hierarchy Process (AHP) to analyze the importance of different factors in the green transformation of private enterprises from the perspectives of the target layer, comprehensive layer, and element layer. Based on the perspective of high-quality development and starting from the current development status of private enterprises, the importance of green transformation for improving the competitiveness of private enterprises is clarified with the support of national policies. With the driving factors for promoting the green transformation of private enterprises as the focal point, the aim is to study how to achieve the goal of green transformation. The Analytic Hierarchy Process (AHP) is a research method that decomposes decision-making into goals, implementation strategies, and specific plans, and conducts quantitative or qualitative analysis based on this. In recent years, foreign scholars have used AHP to construct evaluation index systems in various fields such as ecosystems, ecological economic value, and low-carbon green. There have also been many research results in China that use the AHP analysis method to evaluate the development of industrial green transformation [8-9].

3. Analysis of the Driving Factors behind BYD’s Green Transformation

BYD is a well-known private enterprise in Shenzhen, China, which has achieved a leading advantage in areas such as automobiles, batteries, and contract manufacturing. It has particularly excelled in the field of green and low-carbon development, setting a benchmark for the green transformation and development of private enterprises. This study aims to explore the key driving factors through the analysis of BYD’s green transformation practices. The reasons for choosing BYD are based on the company’s typical characteristics of green and low-carbon manufacturing in its product production, as well as the successful implementation of high-quality development strategies, which have gained widespread respect from both domestic and international industries. Moreover, BYD’s new energy vehicles and other products are key breakthrough areas in China’s high-tech development. If the designed green transformation path can provide experiential references for the high-quality development of Chinese enterprises, its practical significance is self-evident. In order to ensure the diversity of data sources and information, as well as to meet the requirements of mutual verification, this study mainly relies on data and information from BYD’s annual reports, BYD’s official website, media videos, and academic journals.

3.1. Government Policy Level

National strategies and policies provide theoretical foundations and strategic support for BYD’s green transformation. Wang Chuanfu has publicly stated that Chinese entrepreneurs can only be happy by following the national strategy. In recent years, the national and local governments have issued a series of policy systems, such as the National Development and Reform Commission’s “Opinions on Improving the System and Policy Measures for Energy Green and Low-Carbon Transformation” issued in February 2022, which clearly defines the basis, direction, focus, and measures for the green transformation of relevant industries. This opens a new chapter for the green transformation of enterprises, the People’s Bank of China continued to implement three structural monetary policy tools, including carbon emission reduction support tools, and included enterprises in the scope of financial institutions supporting green and low-carbon tools, deepening innovative green financial services. At the local government level, for example, in December 2021, Shenzhen City issued a green policy list with indexing functions to help local enterprises (especially small and micro enterprises) achieve green recovery and transformation. Policy guidance provides strong financial subsidy support to BYD’s green transformation, raises consumer awareness of environmental protection, and achieves BYD’s new energy vehicles. At the national level, with top-level design as the starting point, governments at all levels and departments have implemented policies step by step, strengthening the authority of policies and providing guarantees for the implementation of green transformation policies by companies like BYD.

3.2. Enterprise Level

Green transformation is a necessity for BYD to improve its competitiveness. In 2017, on the CCTV program “Kai Jiang La,” Wang Chuanfu talked about BYD’s green dream and pointed out that China’s energy security and improvement of air quality are the main driving forces for BYD’s green transformation. The mission and responsibility of entrepreneurs are important supporting forces and fundamental guarantees for the sustainable development of private enterprises. Green transformation promotes technological innovation, which is a need for enterprises to enhance their competitiveness. From component production to key technologies and chain competition, green transformation is both an opportunity and a challenge for BYD. On August 10, 2023, in a speech celebrating the production of 5 million new energy vehicles by BYD, Wang Chuanfu pointed out that private enterprises must seize the opportunity of green transformation and bravely face challenges in order to stand at the forefront of competition in the green and low-carbon economic era. First-class employees, organizations, technologies, culture, and enterprises are the fundamental guarantee for BYD to participate in domestic and international market competition and gain competitiveness.

3.3. Customer Level

“Enterprises come from customers and go to customers.”
In April 2022, BYD officially announced the cessation of production of fuel vehicles, with the important factor being the energy crisis caused by the Russia-Ukraine war, which led to skyrocketing oil prices. The high energy costs of high-priced vehicles have reduced customers’ driving experience and lowered their willingness to purchase fuel vehicles. The demand for high-quality products or services from customers drives the transformation and upgrading of enterprises. With the continuous improvement of the level of socio-economic development, customers will inevitably demand higher requirements for goods and services. This requires producers to increase technological investment, continuously develop new products, and produce more targeted and attractive products based on a thorough understanding of consumer needs. This strengthens BYD’s corporate image, enhances the brand value influence of the enterprise, expands production and sales share, and improves the overall performance and profitability of the enterprise. In China, electricity prices are much lower than oil prices, and BYD understands the needs of Chinese customers, which is BYD’s new energy vehicles are highly popular. At the same time, BYD has a significant advantage in green new energy technology, which has unprecedented appeal to high-end customers in the international market.

In conclusion, the driving factors for BYD’s high-quality development case analysis include policy guidance at the government level, the practical needs of enterprise operations, and customer demand for products and service supply. These factors form a driving system that promotes the logical evolution of the green transformation of private enterprises. On the evaluation principles and methods developed by the Standard Working Committee of the China Biodiversity Conservation and Green Development Foundation, combined with the current status of BYD’s green development, and adhering to the principles of scientificity, systematicness, and reasonableness, on the basis of mature indicator systems studied by relevant scholars[10], three primary indicators and ten secondary indicators are set, as shown in Table 1.

### 4. Empirical Analysis of the Green Transformation of Private Enterprises

Eight participants, including private enterprise leaders, consumers, and experts/scholars, are invited to evaluate a judgment matrix. The elements of the matrix are set as and , and relative weights are assigned as . The number of elements is . The judgment matrix is denoted as , where the values of are assigned by the expert team using a 9-point scale.

#### 4.1. Consistency Check

After assigning values based on the proposed 9-point scale, the consistency check results are shown in Table 2. The consistency ratios of each index's judgment matrix are all acceptable, indicating that the weighting of the indicator system has passed the consistency check.

#### 4.2. Results and Analysis

According to the evaluation results (Table 3), in the
comprehensive evaluation layer, the driving factors are sequentially ordered by weight as the enterprise level, customer level, and government level support, with respective weights of 0.5208, 0.3743, and 0.1049. It is evident that the importance of internal green transformation within enterprises far exceeds the other two external factors. This indicates that intrinsic factors within enterprises play a dominant role in promoting the high-quality development of private enterprises through green transformation. Regarding external factors, market response and consumer demand are the core drivers of the green transformation of private enterprises. At the driving level, the top three factors for "Green Transformation - Government," "Green Transformation - Enterprise," and "Green Transformation - Customer" are "Technological Innovation, Market Response, Capital Investment," "Market Response, Technological Innovation, Capital Investment," and "Market Response, Technological Innovation, Entrepreneurial Ethics," respectively. It can be seen that the capability for green technological innovation is the primary indicator for government policies to assess the potential of private enterprises for green transformation; enterprises are more concerned with market response, as the pull of the consumer market is the primary driving force for the green transformation of private enterprises; from the consumer’s perspective, the appeal and influence of the product are key. Private enterprises should enhance the green utility of consumers through green standards in technology, products, pricing, and services.

The ten factors, ordered by their average weight, are as follows: Customer Satisfaction, Market Response, Technological Innovation, Capital Investment, Entrepreneurial Ethics, Product Process, Policy Support, Talent Team, Organizational Management, and Corporate Management, with weights of 0.1930, 0.1813, 0.1430, 0.1268, 0.0955, 0.0658, 0.0578, 0.0468, 0.0466, and 0.0429, respectively. Among them, the weights of Customer Satisfaction and Market Response are significantly higher than those of other influencing factors. This suggests that consumers place greater emphasis on brand and reputation and focus more on product quality and cost-effectiveness when purchasing green products and engaging in green consumption. Capital Investment ranks third, indicating that the green transformation of private enterprises, from the construction of environmental protection facilities to technological transformation, requires continuous capital investment, which is also an important material basis for ensuring the construction of standardization. The Entrepreneurial Ethics indicator ranks fourth, which suggests that balancing the significant risks of continuous investment of human, financial, physical, and energy resources with the pursuit of maximizing benefits by private enterprises requires the ethical and moral standards of entrepreneurs to promote and support. The indicators ranked in the latter six positions are not significantly different from each other, indicating that while these six indicators do not have a large impact on the construction of standardization, they are indispensable and remain necessary factors for the green transformation.

Table 3. Weights of Evaluation Indices for Green Transformation Development of Private Enterprises

<table>
<thead>
<tr>
<th>First-level Index and Weights</th>
<th>Second-level Index</th>
<th>Government Level Weight</th>
<th>Enterprise Level Weight</th>
<th>Customer Level Weight</th>
<th>Average Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government Level A 0.1049</td>
<td>Policy Support A1</td>
<td>0.0668418</td>
<td>0.0341785</td>
<td>0.0555223</td>
<td>0.0578269</td>
</tr>
<tr>
<td></td>
<td>Organizational Management A2</td>
<td>0.0604909</td>
<td>0.0239152</td>
<td>0.0827157</td>
<td>0.0466458</td>
</tr>
<tr>
<td>Enterprise Level B 0.5208</td>
<td>Entrepreneur Ethics B1</td>
<td>0.105863</td>
<td>0.109275</td>
<td>0.154422</td>
<td>0.0955741</td>
</tr>
<tr>
<td></td>
<td>Technological Innovation B2</td>
<td>0.177743</td>
<td>0.103221</td>
<td>0.175199</td>
<td>0.143092</td>
</tr>
<tr>
<td></td>
<td>Organizational Management B3</td>
<td>0.0345569</td>
<td>0.0533613</td>
<td>0.071292</td>
<td>0.0429062</td>
</tr>
<tr>
<td></td>
<td>Product Process B4</td>
<td>0.0467338</td>
<td>0.06929</td>
<td>0.113200</td>
<td>0.0658144</td>
</tr>
<tr>
<td></td>
<td>Capital Investment B5</td>
<td>0.144157</td>
<td>0.137243</td>
<td>0.0304922</td>
<td>0.126817</td>
</tr>
<tr>
<td></td>
<td>Talent Team B6</td>
<td>0.0412336</td>
<td>0.0762154</td>
<td>0.0396217</td>
<td>0.0468762</td>
</tr>
<tr>
<td>Customer Level C 0.3743</td>
<td>Market Feedback C1</td>
<td>0.162983</td>
<td>0.202706</td>
<td>0.208301</td>
<td>0.181364</td>
</tr>
<tr>
<td></td>
<td>Customer Satisfaction C2</td>
<td>0.0668418</td>
<td>0.190945</td>
<td>0.0555223</td>
<td>0.193083</td>
</tr>
</tbody>
</table>

5. Implementation Pathways for the Green Transformation of Private Enterprises

In light of the analysis results, this study believes that the green transformation of private enterprises under the perspective of high-quality development should focus on factors such as policy support, capital investment, organizational management, and the market.

5.1. Seek National Policy Support

National policy support is a prerequisite for the green transformation of private enterprises. Currently, the state has introduced relevant policies to provide policy guidance for the green transformation of private enterprises. In addition to existing policies, private enterprises can seek professional talent support from the state. This can be achieved by having the state establish expert teams to visit enterprises for on-site reform assessments and providing remote guidance from expert talents to provide intellectual support for the green transformation. The state can also enhance the government’s guiding role by establishing a green technology innovation system. The government should increase its support for green technology innovation, providing policy support and economic incentives to encourage enterprises to engage in green technological innovation. The government can also establish green technology innovation demonstration zones to provide enterprises with innovative platforms and resource support, promoting the application of green technology in enterprises.
5.2. Increase Financial Support and Improve Investment in Infrastructure Construction and Green Technology Research and Development

To achieve green transformation, it is first necessary to improve green infrastructure, which establishes a material foundation for the implementation of the green transformation and continued development post-transformation. Secondly, efforts should be made to overcome key technologies. The level of greening is directly related to the level of technological advancement. Mastering key technologies not only increases the enterprise's sustainable development capabilities but also helps to lay out a sound green industry system, providing strong financial support for the green transformation.

5.3. Cultivate a Green Corporate Culture and Leverage the Leading Role of Entrepreneurs

To cultivate a green corporate culture, companies can strengthen environmental education and training for employees, making them fully aware of the importance of environmental protection to the development of the enterprise. Companies can also establish environmental protection reward systems to encourage employees to actively participate in environmental actions and create a positive environmental atmosphere. Enterprises should also strengthen internal and external communication and cooperation, establishing good cooperative relationships with the government, social organizations, and customers to jointly promote green transformation. The goals of green transformation in private enterprises reflect the highest ideals and pursuits of all employees and are a prerequisite for the green transformation of private enterprises. Entrepreneurs often play an irreplaceable leading role in promoting the construction of green corporate culture. The leader’s example is a silent call, instilling the concept of the enterprise’s green transformation into all employees through their own actions. The implementation of this concept in business operations is manifested by dividing a private enterprise into several green levels and units, breaking down a huge task into several green standardization tasks, forming a clear green standardization system, and ensuring the successful completion of the transformation work.

5.4. Conduct Green Knowledge Training within the Enterprise

The implementation of green knowledge training provides a safeguard for the green transformation of private enterprises. Historically, transformation and upgrading have often been obstructed by various forces. There is also a possibility that the initial stages of green transformation in private enterprises may be hindered due to the impact on the interests of some people, or there may be opposition to the transformation due to skepticism about the methods of green transformation, or a lack of belief in its ability to help private enterprises develop better, and therefore, no support for the transformation. Conducting green knowledge propaganda and education within private enterprises helps to deeply root the concept of green transformation, assisting employees in fully understanding the benefits and usefulness of the enterprise’s green transformation, establishing a mindset for green transformation, enhancing the capacity for green operations, and further promoting the smooth progress of the transformation.

5.5. Establish a Green Technology Innovation System

Establishing a green technology innovation system is key to achieving the green transformation of private enterprises. Enterprises can enhance their innovation capabilities by increasing R&D investment, cultivating high-quality scientific research talents, and introducing advanced green technologies. Enterprises should also actively cooperate with scientific research institutions and universities to jointly carry out green technology innovation research, achieving resource sharing and complementary advantages. Establishing a green technology innovation system also requires strengthening cooperation and communication among enterprises. Enterprises can promote cooperation and communication among them by establishing alliances or associations, jointly promoting the innovation and application of green technology. Enterprises can also engage in international cooperation to attract advanced green technology and experience from abroad, promoting technological exchange and cooperation between domestic and foreign enterprises. In the process of establishing a green technology innovation system, it is also necessary to strengthen the construction of technical standards and regulatory systems. Formulating unified green technology standards and establishing a sound technical supervision mechanism can standardize the green technology innovation behavior of enterprises, promoting the application and promotion of green technology. At the same time, strengthen the technical evaluation and supervision of enterprises to ensure the effective implementation and operation of green technology.

5.6. Introduce Green Finance to Reduce the Cost of Environmental Protection Investment

Compared with traditional financial institutions, green financial institutions pay more attention to environmental protection and sustainable development, and therefore, are more inclined to provide more support to enterprises in terms of financing conditions. For example, it can reduce the financing pressure on enterprises by lowering interest rates and providing loan guarantees, thereby reducing the cost of environmental protection investment. Traditional financial institutions have relatively limited support for financing environmental protection projects, often facing difficulties and high costs in financing. Green financial institutions are committed to supporting the development of green industries and environmental protection projects, providing more financing channels and opportunities. Enterprises can raise funds by issuing green bonds and applying for green loans, thereby reducing the cost of environmental protection investment. At the same time, the introduction of green finance can also provide professional consulting and services to help enterprises make environmental investment decisions and manage projects, improving investment benefits. Green financial institutions not only focus on the environmental benefits of the project when evaluating green transformation projects but also provide professional consulting and services to help enterprises with feasibility analysis, risk assessment, project management, and other aspects. With professional guidance and support, enterprises can make more scientific investments in green technology and projects.
environmental investment decisions, reduce investment risks, and improve investment benefits.

5.7. Improve the Green Standard System and Strengthen the Supervision and Evaluation of Green Standardization Construction

A sound green standard system is the foundation of the green transformation of enterprises. The first priority in promoting the green transformation of enterprises through standardization is to establish a suitable green standard system within private enterprises and use this system to regulate the daily activities of private enterprises during the green transformation, determining what is permissible and what is not, providing standards and basis for the daily activities of private enterprises, avoiding speculation and special treatment, and reducing administrative management pressure, providing institutional protection for the transformation. Regularly inspect and evaluate the effectiveness of the implementation of standardization, provide guidance and supervision for those who are not well implemented or strictly enforced, and ensure the strict implementation of the standardization system. At the same time, improve the feedback mechanism of the standardization mechanism operation, smooth the feedback channels, and promote the improvement of the quality of green transformation.

5.8. Strengthen Brand Influence and Digitalize User Services

Pay attention to customers' demand for environmental protection, health, safety, and other consumer needs, value the development of product environmental protection and health attributes; strive to control the rise in the cost of green products due to green technology research and development, environmental protection of raw materials and manufacturing processes, etc., improve the cost-effectiveness of green products, and enhance customer consumption and market recognition, which is key to the green transformation of private enterprises. In combination with the current development of the green transformation of private enterprises, it is necessary to further strengthen the development of green technology and the green upgrading of products, enhance the influence and appeal of green brands. At the same time, private enterprises face a large number of users, understand and meet the personalized needs of customers through the form of big data. At the same time, establish a digital online feedback mechanism to facilitate customers to evaluate services and products, and promote the improvement of green service levels for private enterprises.

6. Conclusion

At present, the green and low-carbon economy is an important form of economic development in our country. Against this backdrop, promoting the green transformation of private enterprises not only meets the requirements of the times but is also an inevitable path for the high-quality development of private enterprises. In view of the current situation of private enterprises in our country, whether it is the early planning, mid-term implementation, or later operation and maintenance, there are still many difficulties and challenges in the green transformation of private enterprises. The transformation and upgrading of private enterprises still have a long way to go and can only be achieved with the help of the government, enterprises, and the market. Private enterprises should seize opportunities of green and low-carbon economic development, meet the challenges of green and low-carbon, make great efforts in green transformation, take the market as the center, lead the transformation with internal enterprise factors, and support the national macroeconomic policy to continuously improve their own strength and brand influence, and promote the green transformation and high-quality development of private enterprises.

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