

Performance Study on Reverse Mixed-Ownership Reform of Private Enterprises

-- Taking Qingxin Environment and Energy-Saving Guozhen as Examples

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Abstract: Since the Third Plenary Session of the 11th Central Committee in 1978, especially with the introduction of the State-owned Enterprise Reform Three-Year Action Plan, the mixed-ownership reform has been further accelerated. The government encourages the mixed-ownership economy and supports the effective integration of state-owned and private capital, aiming to use the advantages of all parties to promote the common prosperity of state-owned enterprises and private enterprises. By 2020, the environmental protection industry has seen a significant "reverse mixed-ownership reform" upsurge. The impact of reverse mixed-ownership reform on the performance of private enterprises, and how private enterprises can utilize the advantageous resources of state-owned enterprises to achieve high-quality development have become hot topics. This article takes Qingxin Environment and Energy-saving Guozhen as case studies, using case analysis, event study, and comparative analysis methods to deeply explore the effectiveness of the reverse mixed-ownership reform of the two companies, and points out the risks and challenges encountered in the reform process. At present, there are many case studies on state-owned enterprises introducing private strategic investors, but there are very few comparative case studies on the reverse mixed-ownership reform of private enterprises. This paper provides valuable experience for private enterprises to participate in reverse mixed-ownership reform and enriches the case study of mixed-ownership reform by comparing the two cases.

Keywords: Reverse Mixed-Ownership Reform, Environmental Protection Industry, Performance Evaluation

1. Introduction

Since 2015, the Central Financial and Economic Affairs Commission has issued the "Guiding Opinions on Deepening the Reform of State-Owned Enterprises," advocating the participation of non-state-owned enterprises in the reform of state-owned enterprises and supporting state-owned capital's equity investment in non-state-owned enterprises, emphasizing the core role of private enterprises in the mixed-ownership economy. In April 2018, the Commission further proposed to reduce the leverage of local governments and enterprises through "structural deleveraging," starting to reduce the macro leverage ratio. The "Double Hundred Action" plan released in the same year encouraged both state-owned and private enterprises to join the mixed-ownership reform. The policy of reducing leverage rates led to an increase in financing costs for private enterprises, affecting their operations, and introducing state-owned capital became a strategy to alleviate financing difficulties. Therefore, since 2018, many private enterprises have introduced state-owned capital, and the mixed-ownership reform model has shifted from state-owned enterprises introducing private capital to a diversified approach, including changes in control rights and strategic investments only. The "State-Owned Enterprise Reform Three-Year Action Plan" released in June 2020 further promoted mixed-ownership reform, including mixed-ownership reform in competitive fields, two-way mixed-ownership reform, and the deepening of capital and mechanism reform. These steps have made the motives, path choices, and effectiveness of private enterprises an important research topic. As for PPP projects, the Ministry of Finance's No. 92 and No. 192 documents in 2017 were all aimed at controlling risks and tightening PPP projects, affecting private environmental protection enterprises that rely on PPP.

After 2018, more than 20 environmental protection enterprises introduced state-owned capital for mixed-ownership reform. This paper will analyze the mixed-ownership reform effects of Qingxin Environment and Energy-saving Guozhen through two cases, explore the problems and challenges in the mixed-ownership reform, and provide a reference for other private enterprises' mixed-ownership reform.

2. Literature Review and Theoretical Basis

2.1. Definition of "Reverse Mixed-Ownership Reform"

The mixed-ownership reform began in the 1990s, initially aimed at injecting vitality into state-owned enterprises by introducing non-public equity capital and improving their governance and operational mechanisms. With the advancement of the reform, the state gradually deepened the cross-shareholding of public and non-public capital. In 2015, the National Development and Reform Commission proposed three models of mixed-ownership reform: state-owned enterprises introducing non-public capital; employee stock ownership; state-owned capital investment and operation companies' equity investment in non-state-owned enterprises, that is, reverse mixed-ownership reform.

Regarding the concept of reverse mixed-ownership reform, scholar Liu Jie (2024) proposed the concept of reverse mixed-ownership reform, which refers to the cooperation between private enterprises, foreign capital, and other non-state-owned enterprises with the State-owned Assets Supervision and Administration Commission or state-owned enterprises, introducing a certain scale of state-owned capital [1]. Scholar

Gong Yingzi (2023) believes that "reverse mixed-ownership reform" refers to a reform approach where private enterprises introduce state-owned capital, transforming from non-public enterprises to mixed-ownership enterprises. At present, the main methods for private enterprises to carry out reverse mixed-ownership reform include equity transfers, voting rights entrustment, and private placements of shares [2]. In fact, reverse mixed-ownership reform is a win-win approach. On the one hand, private enterprises can reduce financing costs and enhance the ability to obtain resources by leveraging the state-owned background through reverse mixed-ownership reform. On the other hand, it also helps state-owned enterprises to find high-quality investment channels to achieve common progress in enterprise performance.

2.2. Theoretical Basis

2.2.1. Resource Dependence Theory

Enterprises depend on a variety of resources in their operations. Reverse mixed-ownership reform is a way for private enterprises to obtain resources, helping them establish political connections and synergy, thereby stabilizing the supply of resources. According to the resource dependence theory, financing is an extremely important resource for private enterprises. By introducing state-owned capital, private enterprises can not only obtain credit resources from commercial banks through political connections, expand financing channels, obtain more low-interest long-term loans, reduce financing costs, and alleviate financing constraints but also relieve financing constraints. In addition, Hillman and others (2009) believe that the size and structure of the board of directors are key factors for enterprises to obtain resources [3]. At the same time, there is also a connection between resource dependence and political behavior. Meznar and Nigh's (1995) research shows that enterprises with close relationships with the government are more inclined to participate in political activities [4]. The mixed-ownership reform enables private enterprises to establish government connections through state-owned capital investment, helping enterprises expand their social networks and obtain resources such as government subsidies, policy support, and property rights protection. Such resource integration not only forms a complementary advantage but also enhances the competitiveness of enterprises and exerts a powerful synergy.

2.2.2. Synergy Effect Theory

In the 1960s, American strategist Igor Ansoff first integrated the concept of synergy into business management and proposed synergy strategy. He believed that the synergy effect refers to the organic combination of two or more independent elements within an enterprise, producing an effect that exceeds the sum of the individual effects, achieving the phenomenon of "1+1>2." This effect can effectively integrate resources, reduce costs, and enhance scale benefits. Scholar Li Lin (2023) believes that reverse mixed-ownership reform, that is, the introduction of state-owned strategic investors by private enterprises, is a strategy to achieve synergy effects [5]. This reform combines the resource advantages of state-owned enterprises and the flexibility of private enterprises, achieving business, financial, management, and brand synergy through the difference and complementarity of resources. Wang Defa and Wang Xuesong (2023) pointed out that the integration of resources between different ownerships can effectively release synergy effects, enhance the effectiveness of mixed-ownership reform,

and solve the problems of profitability and efficiency [6].

3. Reasons for Case Selection

This paper selects the case of Qingxin Environment's introduction of Guorun Environment's mixed-ownership reform and the case of Energy-Saving Guozhen's introduction of China Energy Conservation's mixed-ownership reform as comparative cases to explore their mixed-ownership reform effects and conduct comparative analysis. The main reasons for the case selection are: these two companies belong to the environmental protection industry, with similar business scope and enterprise nature. The environmental protection industry is greatly influenced by policies. Since 2018, affected by the tightening of PPP policies and deleveraging policies, a large number of environmental protection star enterprises have introduced state-owned capital to participate in reverse mixed-ownership reform, making the industry selection more representative. The timing of the two companies mixed-ownership reforms is close, both completed in 2020 and 2021.

3.1. Introduction to the Case of Qingxin Environment's Introduction of Guorun Environment

3.1.1. Introduction to Qingxin Environment

Beijing Qingxin Environmental Protection Technology Co., Ltd. (hereinafter referred to as "Qingxin Environment") was originally established as "Beijing Guodian Qingxin Environmental Protection Technology Co., Ltd." in 2001. The company was registered with the Beijing Administration for Industry and Commerce on May 25, 2007, and renamed to its current name on June 5, 2015. In April 2011, Qingxin Environment was successfully listed on the Shenzhen Stock Exchange. The company initially focused on flue gas treatment business in the thermal power industry, and now has expanded its business scope to industrial flue gas treatment, covering industrial energy saving, water treatment, resource utilization, solid and hazardous waste treatment, environmental monitoring and protection, and other fields. Qingxin Environment takes technological innovation as its core, committed to achieving common development in various aspects such as engineering design, construction, and operation, aiming to build itself into a comprehensive environmental protection enterprise.

3.1.2. Process of Qingxin Environment's Mixed-Ownership Reform

On April 23, 2019, Qingxin Environment announced a suspension of trading due to significant matters and disclosed that its major shareholder, Century Land, was preparing for equity transfer. A week later, on April 30, 2019, Century Land signed a share transfer agreement with Guorun Environment, planning to transfer 274 million shares (accounting for 25.31% of the company's total share capital) at a price of 9.08 yuan per share, with a total price of about 2.485 billion yuan to Guorun Environment. Guorun Environment is a wholly-owned subsidiary of Sichuan Development (Holdings) Co., Ltd., actually controlled by the Sichuan Provincial State-owned Assets Supervision and Administration Commission. With the completion of the equity transfer, the Sichuan Provincial State-owned Assets Supervision and Administration Commission will become the controlling shareholder of Qingxin Environment. On July 8, 2019, Qingxin Environment received the "Securities Transfer

Registration Confirmation" issued by the China Securities Depository and Clearing Corporation, marking the company's official entry into a new stage of mixed-ownership reform.

3.1.3. Motivation for Qingxin Environment's Mixed-Ownership Reform

Private enterprises such as Qingxin Environment, facing the dual pressures of tightened PPP projects and significantly tightened bank financing behaviors, have encountered serious risks in the capital chain and financing difficulties, leading to a sharp increase in cash flow demand and limited financing capabilities. Against this backdrop, introducing state-owned capital has become an effective way to solve financing difficulties, which can not only enhance the company's credit rating and debt repayment ability but also provide necessary support for the company in adverse situations such as tight capital of controlling shareholders and equity pledge. At the same time, facing the fierce competition in the environmental protection market and the government's support policies, Qingxin Environment also needs to consider business transformation, expanding from traditional businesses such as air pollution prevention in coal-fired power plants to more diversified environmental protection services. The introduction of state-owned capital not only brings financial support but may also introduce new projects and technologies, helping the company maintain an advantage in competition and achieve sustainable development and transformational upgrading.

3.2. Introduction to the Case of Energy-Saving Guozhen's Introduction of China Energy Conservation

3.2.1. Introduction to Energy-Saving Guozhen

China Energy Conservation Energy-Saving Guozhen Technology Co., Ltd. (hereinafter referred to as "Energy-Saving Guozhen") was established in 1997 and was listed on the Growth Enterprise Market of the Shenzhen Stock Exchange in 2014. Before the reverse mixed-ownership reform, the company was originally named Anhui Guozhen Environmental Protection and Energy Saving Technology Co., Ltd., controlled by Anhui Guozhen Group Co., Ltd. Energy-Saving Guozhen has been in the water affairs industry for more than 20 years and is one of the earliest enterprises to enter the municipal water affairs market in China, focusing on municipal sewage, rural sewage, industrial sewage, and water environment comprehensive management. The company's service scope covers more than twenty provinces, autonomous regions, and municipalities directly under the Central Government. With rich experience and an advantageous industrial chain, Energy-Saving Guozhen provides a full range of services including environmental protection project investment, scientific and technological research and development, design and construction, equipment manufacturing and integration, and project operation.

3.2.2. Process of Energy-Saving Guozhen's Mixed-Ownership Reform

In 2019, Anhui Guozhen Environmental Protection and

Energy Saving Technology Co., Ltd. welcomed its first strategic investment from state-owned capital through a private placement, with China Energy Conservation Capital Holdings Limited offline subscription of 58.275 million shares. Subsequently, in 2020, the controlling shareholder of Guozhen Environmental Protection and China Energy Conservation signed a share transfer agreement, transferring 100.588 million shares held to China Energy Conservation and entrusting 41.978 million shares of voting rights to China Energy Conservation for exercise. After the completion of this series of agreement transfers, China Energy Conservation and its wholly-owned subsidiaries held a total of 158.863 million shares of the company, accounting for 23.69% of the total share capital; held voting rights shares of 200.841 million, accounting for 29.95% of the total share capital. This means that China Energy Conservation will become the controlling shareholder of the company, and the State-owned Assets Supervision and Administration Commission of the State Council will become the actual controller of the company.

3.2.3. Motivation for Energy-Saving Guozhen's Mixed-Ownership Reform

On the one hand, private environmental protection enterprises are facing a shortage of capital chain and financing difficulties, especially in the case of long construction periods for project construction and engineering construction, coupled with the rapid growth of interest expenses, making the alleviation of financing pressure the main reason for enterprises to introduce state-owned capital. On the other hand, the government continues to increase investment in environmental protection funds and supports the environmental protection industry through fiscal subsidies, tax rebates, and other means. Introducing state-owned capital helps to enhance the competitiveness of enterprises. In addition, as a central enterprise, China Energy Conservation, through close cooperation with environmental protection enterprises, drives the entire environmental protection industry to upgrade capacity, achieve effective allocation of resources, and promote the improvement of the industry's productivity. Therefore, the in-depth strategic cooperation between Guozhen Environmental Protection and China Energy Conservation is not only an equity transaction but also a business synergy model based on technology operations and governance platforms, which is expected to promote high-quality development of the enterprise.

4. Financial Performance Evaluation

4.1. Profitability

This section selects two indicators, the net profit attributable to the parent company of Qingxin Environment and Energy-Saving Guozhen, as well as the return on equity (ROE), to judge the profitability of Qingxin Environment and Energy-Saving Guozhen after the mixed-ownership reform.

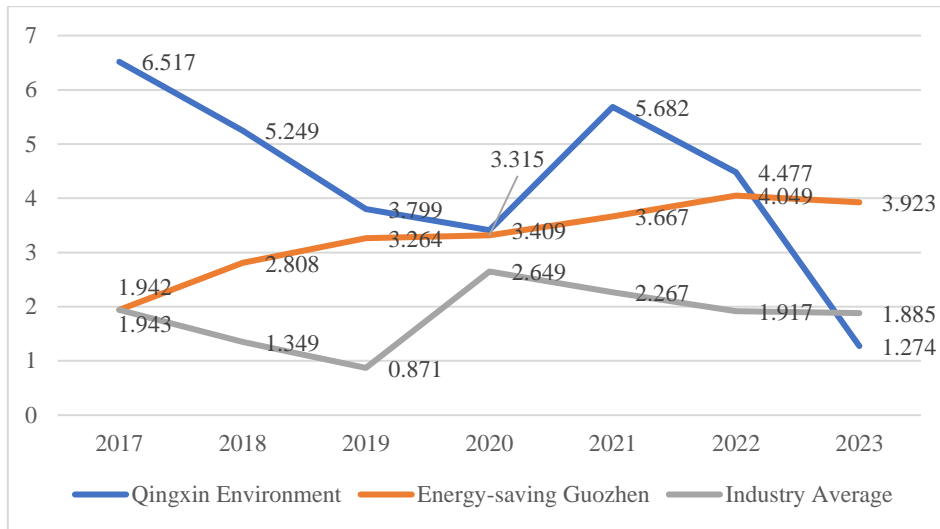


Figure 1. Change in Net Profit Attributable to the Parent Company of Qingxin Environment and Energy-saving Guozhen
Source of Data: Sina Finance

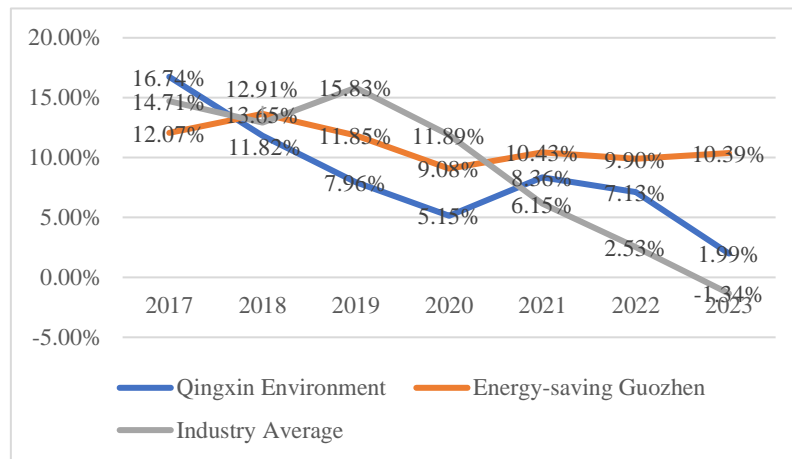


Figure 2. Change in Return on Equity (ROE) of Qingxin Environment and Energy-saving Guozhen
Source of Data: Sina Finance

Table 1. Profitability of Qingxin Environment from 2017 to 2023

Year	Net Profit Attributable to the Parent Company (in 100 million)	Industry Average of Net Profit Attributable to the Parent Company (in 100 million)	Return on Equity (ROE)	Industry Average of ROE
2017	6.517	1.943	16.74%	14.71%
2018	5.249	1.349	11.82%	12.91%
2019	3.799	0.871	7.96%	15.83%
2020	3.409	2.649	5.15%	11.89%
2021	5.682	2.267	8.36%	6.15%
2022	4.477	1.917	7.13%	2.53%
2023	1.274	1.885	1.99%	-1.34%

Source of Data: Sina Finance

The net profit attributable to the parent company of Qingxin Environment showed an initial increase after the mixed-ownership reform. In 2021, the net profit attributable to the parent company of the company surged by 170.54% compared to 2020, showing a prominent performance. However, in 2022 and 2023, the net profit attributable to the parent company fell by 21.43% and 71.47%, respectively, showing a continuous downward trend. In addition, the return on equity of Qingxin Environment continued to decline

before the mixed-ownership reform. It was not until the introduction of Guorun Environment in 2019 that the company's return on equity began to significantly rebound in 2021, with a year-on-year increase of 108.61%. Although the return on equity of the company continued to decline in 2022 and 2023, it was in line with the trend of the industry's return on equity. The main reason for this fluctuation was that in 2019, Qingxin Environment no longer controlled Aluminum Energy Qingxin, which reduced its profitability. In 2020, the

COVID-19 pandemic caused a shock to the global industry, and many projects of Qingxin Environment were forced to suspend, exacerbating the company's difficulties. At the same time, the tension between China and India also led to project delays, further reducing profitability. In 2021, with the normalization of pandemic prevention and control, Qingxin Environment actively adapted to the impact of the epidemic, relying on the support of Guorun Environment, successfully developed the Southwest and East China markets, and achieved results in the fields of water affairs, solid waste

disposal, and resource utilization, creating new profit growth points. The performance decline in 2022 and 2023 was mainly due to the impact of the macroeconomy, delays in project acceptance and accounts receivable collection, an increase in credit impairment losses, and an increase in financial expenses due to the company's investment expansion. With the improvement of the macroeconomic situation, it is expected that the operational quality of Qingxin Environment will be improved.

Table 2. Profitability of Energy-saving Guozhen from 2017 to 2023

Year	Net Profit Attributable to the Parent Company (in 100 million)	Industry Average of Net Profit Attributable to the Parent Company (in 100 million)	Return on Equity (ROE)	Industry Average of ROE
2017	1.942	1.943	12.07%	14.71%
2018	2.808	1.349	13.65%	12.91%
2019	3.264	0.871	11.85%	15.83%
2020	3.315	2.649	9.08%	11.89%
2021	3.667	2.267	10.43%	6.15%
2022	4.049	1.917	9.90%	2.53%
2023	3.923	1.885	10.39%	-1.34%

Source of Data: Sina Finance

Despite the overall downward trend in the industry's net profit attributable to the parent company, the net profit attributable to the parent company of Energy-saving Guozhen showed a fluctuating upward trend after the mixed-ownership reform. The company introduced state-owned strategic investors in 2019, and the net profit attributable to the parent company in the same year increased by 68.11% compared to 2017, but the growth rate slowed down by 2020. After the reverse mixed-ownership reform, in 2021, the net profit attributable to the parent company of Energy-saving Guozhen increased by 10.62% compared to the previous year. This growth is mainly due to the company's significantly enhanced ability to obtain high gross profit projects after the introduction of state-owned strategic investors. Despite the challenges of work suspensions and production stops brought by the pandemic faced by the industry in 2021, Energy-saving Guozhen, relying on the new platform of mixed-ownership reform, actively implemented the "market expansion year" strategy, and strengthened the investment in high gross profit comprehensive service projects such as water environment management, which increased the proportion of these projects in the total business income, maintaining the growth momentum of net profit.

In terms of return on equity, Energy-saving Guozhen

showed a downward trend from 2018 to 2020, with the return on equity in 2020 decreasing by 28.78% compared to 2018, and both 2019 and 2020 were below the industry average. After the reverse mixed-ownership reform, the company's return on equity increased in 2021, with a year-on-year increase of 15.27%. This change is partly due to the addition of state-owned strategic investors in 2019, which led to the company's additional issuance of shares, thereby expanding the scale of net assets, but also resulting in a reduction in the return on equity. By 2020, the company further increased its net assets through share transfers. After the reverse mixed-ownership reform, Energy-saving Guozhen actively integrated into the domestic energy-saving market, obtained high-quality projects, and optimized regional marketing and management systems, thereby enhancing the company's profitability and market competitiveness, which in turn increased the return on equity.

4.2. Operational Capability

This section selects inventory turnover and accounts receivable turnover as two indicators to measure the operational capabilities of Qingxin Environment and Energy-saving Guozhen after the mixed-ownership reform.

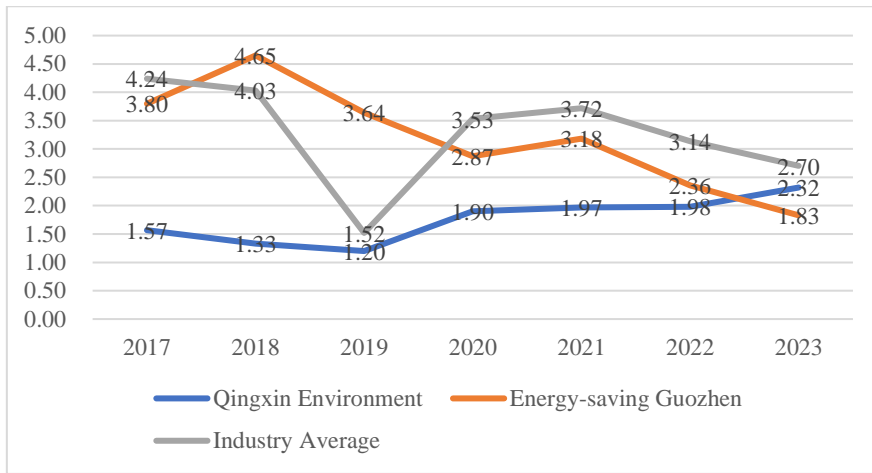


Figure 3. Change in Accounts Receivable Turnover of Qingxin Environment and Energy-saving Guozhen (Units: Times)

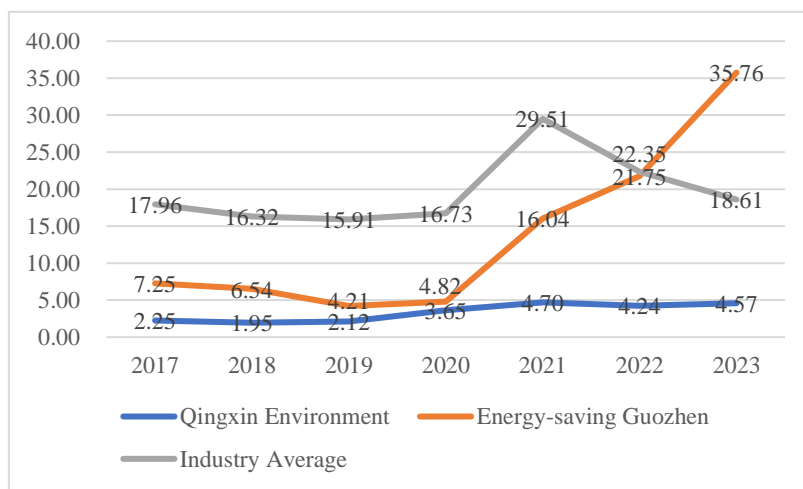


Figure 4. Change in Inventory Turnover of Qingxin Environment and Energy-saving Guozhen (Units: Times)

Source of Data: Sina Finance

Before the implementation of the reverse mixed-ownership reform, the accounts receivable turnover of Qingxin Environment continued to decline. However, since the mixed-ownership reform, this indicator has improved year by year, increasing from 1.2 times in 2019 to 1.97 times in 2021, significantly accelerating the recovery speed of accounts receivable. In addition, the inventory turnover rate of Qingxin Environment was also low before the mixed-ownership reform, but it has continued to climb since Guorun Environment's participation in 2019, reaching 4.70 times by 2021. This change is mainly due to the company's introduction of Guorun Environment, which strengthened account management and resource utilization efficiency, thereby improving operational efficiency. At the same time, the addition of Guorun Environment also brought more government and state-owned enterprise customers to Qingxin Environment, improving the quality and proportion of customers, further accelerating the turnover of accounts receivable and reducing bad debt losses.

The inventory turnover rate of Energy-saving Guozhen showed a slow downward trend from 2017 to 2019, reflecting the company's shortcomings in inventory management. However, after the reverse mixed-ownership reform, this indicator has rapidly increased, with a significant growth of 233.10% in 2021 compared to the previous year, far

exceeding the industry average growth rate of 56.76%, indicating a significant improvement in the company's operational efficiency. In terms of accounts receivable, Energy-saving Guozhen faced challenges between 2019 and 2020, with the growth rate of accounts receivable exceeding the growth rate of operating income. Especially in 2020, affected by the pandemic, the company's operating income decreased by 7.21%, leading to a further decline in the accounts receivable turnover rate. However, after the reverse mixed-ownership reform, under the management of China Energy Conservation, the company's project acquisition ability was strengthened, the growth rate of operating income exceeded the growth rate of accounts receivable, thus enhancing the accounts receivable turnover rate in 2021. Although this indicator has declined in 2022 and 2023, it still shows that the company's operational capability has improved in the short term after the reverse mixed-ownership reform, and it is necessary to continue to strengthen the strategy for recovering accounts receivable.

4.3. Debt-paying Ability

This section selects the quick ratio, current ratio, and asset-liability ratio as indicators to measure the debt-paying ability of Qingxin Environment and Energy-saving Guozhen after the mixed-ownership reform.

Table 3. Debt-paying Ability of Qingxin Environment from 2017 to 2023

Year	Current Ratio	Industry Average	Quick Ratio	Industry Average	Debt-to-Asset Ratio	Industry Average
2017	1.18	1.89	0.90	1.56	63.31%	46.29%
2018	1.15	1.66	0.88	1.35	55.10%	51.03%
2019	1.18	1.67	0.91	1.34	48.63%	75.96%
2020	1.01	2.03	0.82	1.82	59.08%	180.00%
2021	1.21	2.23	1.06	2.02	68.05%	47.91%
2022	1.16	2.23	0.96	2.02	67.80%	48.64%
2023	1.10	2.34	0.95	2.12	68.09%	48.33%

Source of Data: Sina Finance

After the reverse mixed-ownership reform, both the current ratio and quick ratio of Qingxin Environment showed an upward trend. The current ratio increased from 1.18 in 2017 to 1.21 in 2021, and the quick ratio also increased from 0.9 to 1.06. This trend reflects that the entry of Guorun Environment has enhanced Qingxin Environment's financing capabilities and short-term debt-paying ability. Specifically, in 2019, Qingxin Environment's current ratio increased by 2.1% compared to the previous year, mainly due to the repayment of due debts in that year, which led to a 16.36% decrease in current liabilities at the end of the year compared to the beginning of the year. However, in 2020, the introduction of Guorun Environment increased financing channels to support the company's daily operations, resulting in a significant increase of 105.85% in short-term borrowings year-on-year, which led to a decrease in the current ratio for that year. By 2021, the current ratio rebounded to 1.21, and the quick ratio increased by 18% year-on-year; the improvement of these two

indicators once again confirmed that the mixed-ownership reform has strengthened the company's short-term debt-paying ability. Before the mixed-ownership reform, Qingxin Environment's debt-to-asset ratio continued to decline, dropping to 48.63% in the year of the reform, which to some extent reflected the optimization of the capital structure. After the mixed-ownership reform, the debt-to-asset ratio has been increasing year by year, from 48.63% in the year of the reform to 68.05%. Although this indicates that the company's long-term debt-paying ability has declined, given the strong shareholder support and the expansion of financing channels due to the change in the actual controller, the debt pressure faced by the company is still controllable. In addition, this also shows that with the support of the major shareholder Guorun Environment, Qingxin Environment continues to expand its business and shows a good development momentum. Overall, Qingxin Environment's debt-to-asset ratio is maintained at a reasonable level.

Table 4. Debt-paying Ability of Energy-saving Guozhen from 2017 to 2023

Year	Current Ratio	Industry Average	Quick Ratio	Industry Average	Debt-to-Asset Ratio	Industry Average
2017	0.98	1.89	0.85	1.56	72.61%	46.29%
2018	0.72	1.66	0.57	1.35	74.71%	51.03%
2019	0.89	1.67	0.71	1.34	74.10%	75.96%
2020	0.94	2.03	0.89	1.82	71.74%	180.00%
2021	0.92	2.23	0.88	2.02	73.80%	47.91%
2022	1.02	2.23	1.01	2.02	71.99%	48.64%
2023	0.85	2.34	0.83	2.12	71.59%	48.33%

Source of Data: Sina Finance

In 2018, before the reverse mixed-ownership reform, Energy-saving Guozhen experienced a significant decline in both the current ratio and quick ratio. This was mainly due to the increase in current liabilities such as notes payable, accounts payable, and interest payable, which was related to the expansion of business scale and the increase in construction projects, leading to an increase in amounts payable to suppliers. After the introduction of state-owned capital, from 2019 to 2022, the company's current ratio and quick ratio generally showed an upward trend, with a significant enhancement in short-term debt-paying ability. This change was partly because the company strengthened its working capital through private placements of shares and cash transfers of shares, reducing dependence on debt. Especially in 2020, due to the new revenue standards leading to the reclassification of inventory, the inventory amount significantly decreased from 907 million to 227 million, which increased the quick assets and thus greatly improved the quick ratio. By 2021, the current ratio slightly decreased, mainly because the company obtained more credit from financial institutions with the support of the state-owned enterprise credit financing platform, and short-term

borrowings increased. By 2022, the company's current ratio and quick ratio further improved, reflecting the continuous enhancement of short-term debt-paying ability. The company used the capital and platform advantages of the central enterprise for optimal allocation of financial resources, effectively reducing debt risks. However, after the introduction of state-owned strategic investors, the debt-to-asset ratio of Energy-saving Guozhen did not change significantly. This is because, although the number of projects increased after the introduction of state-owned capital, the corresponding increase in funding needs, the insufficiency of the company's own funds, and the increase in both long-term and short-term borrowings meant that the recovery of project funds still took time, keeping the debt ratio high and the company's long-term debt-paying ability did not significantly improve. Overall, the company's debt-to-asset ratio remains higher than the environmental protection industry average, and its long-term debt-paying ability is relatively weak. From the current situation, Energy-saving Guozhen's long-term debt-paying ability still needs further improvement.

5. Non-financial Performance Evaluation

5.1. Innovation Performance

Innovation is a key driver of development and a symbol of corporate vitality. This article will evaluate the innovation performance of Qingxin Environment and Energy-saving Guozhen after the reverse mixed-ownership reform from two aspects: R&D investment and R&D output. The R&D investment indicators mainly include the size of the R&D team and the educational structure of its employees, while the output indicators focus on the growth of intellectual property, such as the number of patents and software copyrights.

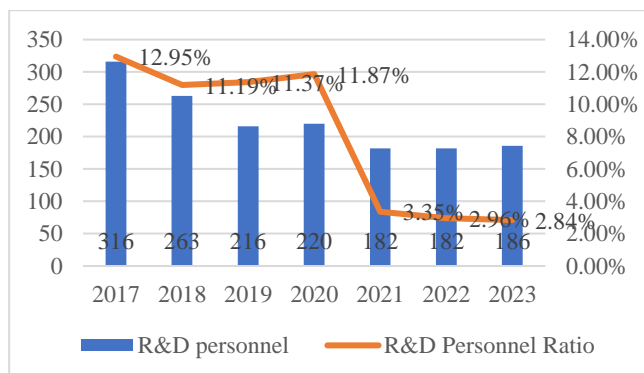


Figure 5. Trend of R&D Personnel Quantity and Proportion in Qingxin Environment

Source: Company Annual Report

Table 5. Educational Background of Qingxin Environment Employees

Education Level	2017	2018	2019	2020	2021	2022	2023
Bachelor's (people)	645	Not Disclosed	Not Disclosed	525	1806	2192	2412
Master's (people)	101	Not Disclosed	Not Disclosed	116	283	380	396
Doctorate (people)	5	Not Disclosed	Not Disclosed	6	15	16	18
Total (people)	751	Not Disclosed	Not Disclosed	647	2104	2588	2826

Source: Company Annual Report

In terms of R&D investment, after the reverse mixed-ownership reform, Qingxin Environment has attracted an increasing number of highly educated talents. Especially in 2021, the number of doctoral employees reached 15, which is 1.5 times that of the previous year. This reflects that with the support of state-owned capital, Qingxin Environment has strengthened the introduction and training of high-level talents. The company has also established an R&D team composed of post-doctoral and senior professional title talents, and introduced experts from top universities and research institutions as technical consultants. In terms of R&D output, by 2021, the enterprise has obtained 431 patent authorizations, a year-on-year increase of 96.80%, showing a significant enhancement in the company's technological innovation and R&D capabilities. Thanks to the technical and resource

support of state-owned shareholders, Qingxin Environment has been able to undertake more projects, thereby improving performance. At the same time, the reverse mixed-ownership reform has also provided the company with more opportunities to win awards. For example, two engineering projects participated in by the company won the "Second Prize of National Science and Technology Progress" in 2019, which is the first time the company has won such a national-level science and technology award, significantly enhancing the company's industry status and influence. These achievements not only demonstrate the company's growth potential under innovation-driven development but also prove the positive impact of reverse mixed-ownership reform on enhancing corporate innovation capabilities.

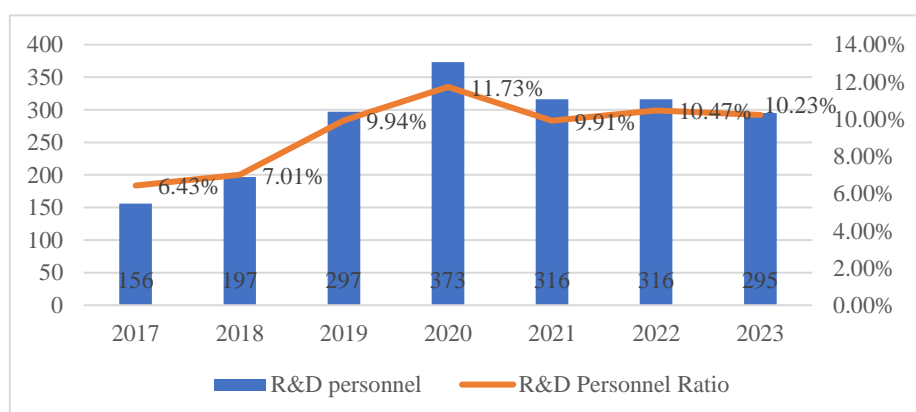


Figure 6. Trend of R&D Personnel Quantity and Proportion in Energy-saving Guozhen

Source: Company Annual Report

Table 6. Educational Background of Energy-saving Guozhen Employees

Education Level	2017	2018	2019	2020	2021	2022	2023
Bachelors (people)	900	987	1053	1071	937	1012	1031
Master's (people)	148	189	187	183	162	150	149
Doctorate (people)	6	13	8	8	8	5	4
Total (people)	1054	1189	1248	1262	1107	1167	1184

Source: Company Annual Report

In terms of R&D investment, after the implementation of the reverse mixed-ownership reform, Energy-saving Guozhen has significantly strengthened the strength of its R&D team. Since 2017, the number of employees with a doctoral degree has increased from 6 to 13, showing the company's active introduction of high-end talents. At the same time, the proportion of R&D personnel in the total number of employees has also significantly increased. The number of R&D personnel in 2020 is twice that of 2017, reflecting the company's emphasis and investment in the R&D department. In terms of R&D output, the company has actively participated in the national 863 plan and successfully established a design research institute and a post-doctoral

scientific research workstation, all of which are signs of the continuous improvement of the company's scientific research capabilities. The company has also won important awards on multiple occasions, including the Huaxia Award and the Construction Science and Technology Award in 2008, and the Second Prize of National Science and Technology Progress three times in 2009, 2012, and 2020. These achievements not only reflect Energy-saving Guozhen's outstanding performance in technological innovation but also prove the continuous strengthening of the company's R&D capabilities with the support of state-owned shareholders in technology and resources. This enhanced R&D capability enables the company to undertake more projects, thereby effectively improving performance levels.

5.2. Governance Performance

In modern enterprise management, a sound corporate governance mechanism is key to promoting the sustainable development of enterprises and improving operational efficiency. Among them, equity structure is a core element of corporate governance, which directly affects the operational efficiency and performance of enterprises. Therefore, this paper will discuss the governance performance of Qingxin Environment and Energy-saving Guozhen after the introduction of state-owned shareholders around the equity structure.

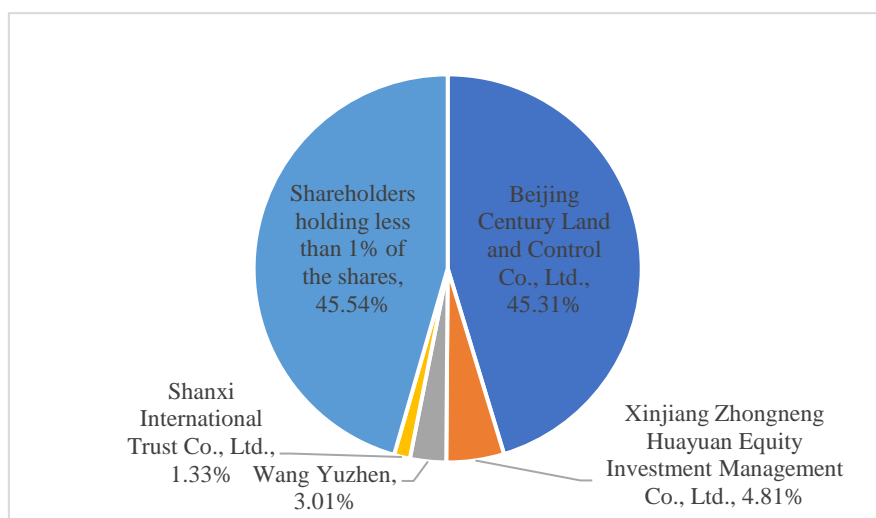


Figure 7. Pre-mixed-ownership reform shareholding ratio of Qingxin Environment

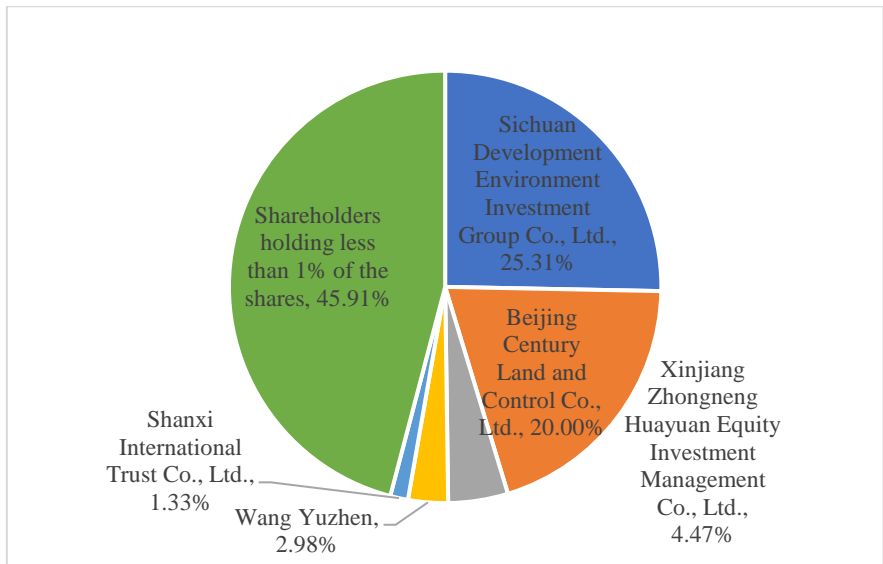


Figure 8. Post-mixed-ownership reform shareholding ratio of Qingxin Environment

Source of Data: Company Annual Report

Before the reverse mixed-ownership reform, Century Land, as the main shareholder of Qingxin Environment, held a significant shareholding ratio of 45.31%, which was notably higher than other shareholders. This led to a high concentration of equity, lacking an effective supervision and balance mechanism, which could easily harm the interests of small and medium shareholders. After the reverse mixed-ownership reform, the actual control of the enterprise was transferred to the Sichuan Provincial State-owned Assets Supervision and Administration Commission, and the equity structure was optimized, with the shareholding ratio of the

largest shareholder significantly reduced. In addition, the shareholding ratios of Guorun Environment and Century Land were 25.31% and 20%, respectively. This relatively close shareholding ratio increased the mutual restraint among major shareholders, which helped to improve the quality of corporate decision-making and avoid the risk of insider control. The total shareholding ratio of other shareholders was also close to that of the largest shareholder, enhancing the supervision and balance against the main shareholders, thereby optimizing the company's governance structure and improving governance performance.

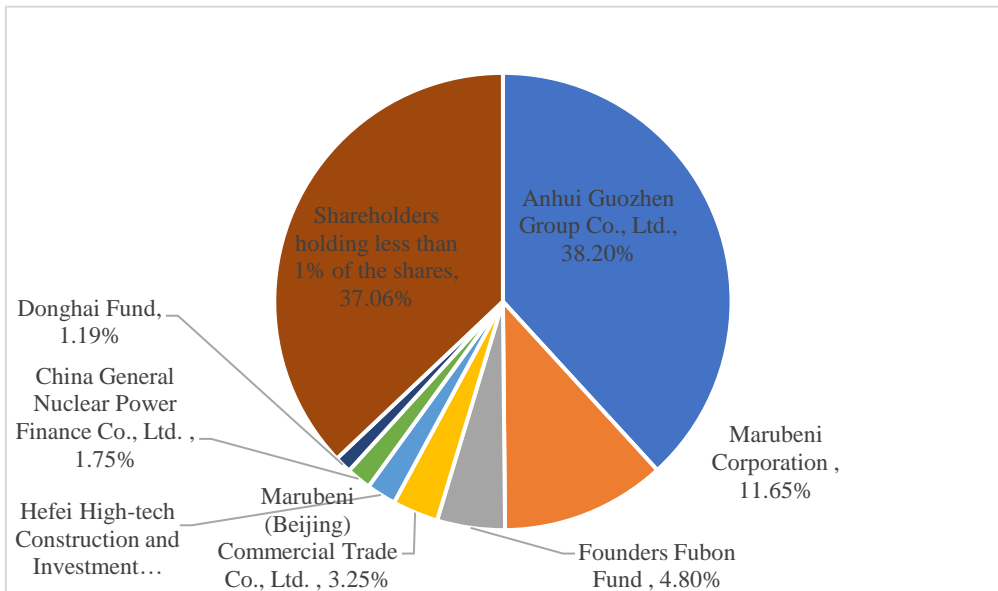


Figure 9. Pre-mixed-ownership reform shareholding ratio of Energy-saving Guozhen

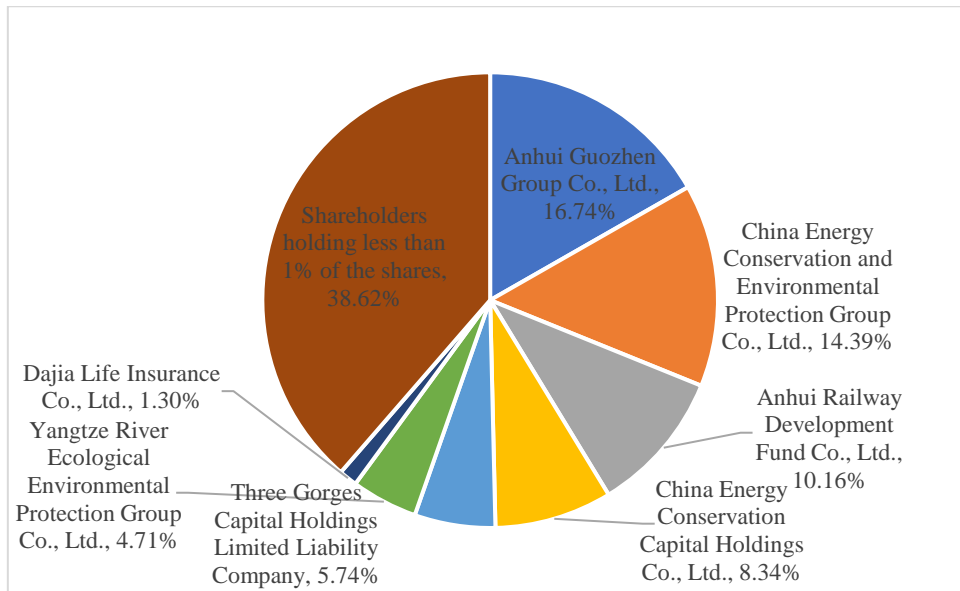


Figure 10. Post-mixed-ownership reform shareholding ratio of Energy-saving Guozhen

Source of Data: Company Annual Report

Similarly, before the introduction of China Energy Conservation, Energy-saving Guozhen also faced the issue of overly concentrated equity, with the main shareholder Guozhen Group holding 38.2%, far higher than other shareholders. Under this structure, it was difficult for small and medium shareholders to effectively supervise and restrain the main shareholders. After the equity transfer, the shareholding ratio of Guozhen Group was reduced to 16.74%, and the shareholding ratio of the second-largest shareholder increased to 14.39%, making the equity more balanced. This change in equity structure transformed the company from a dominant single shareholding to a multi-party shareholding with mutual checks and balances, effectively enhancing the supervision and say of small and medium shareholders. After the introduction of state-owned capital, the balanced equity not only strengthened the supervision and cooperation among all parties but also helped to reduce conflicts of interest, thereby comprehensively improving the corporate governance level of Energy-saving Guozhen.

6. Conclusions and Enlightenment

With the continuous advancement of mixed-ownership reform in China, the reverse mixed-ownership reform model, in which state-owned capital participates in the governance of private enterprises, is becoming increasingly popular. By studying the performance of Qingxin Environment and Energy-saving Guozhen after implementing the reverse mixed-ownership reform, this paper draws the following conclusions: (1) The profitability of Energy-saving Guozhen has improved, while Qingxin Environment needs to further optimize the quality of business operations and enhance its profitability; (2) Qingxin Environment still needs to enhance its inventory management efficiency, while Energy-saving Guozhen should improve the recovery rate of accounts receivable; (3) The short-term debt-paying ability of both companies has improved, but the long-term debt-paying ability still needs to be strengthened, and the capital structure needs to be continuously optimized; (4) The R&D and innovation capabilities of both companies have been strengthened, but Qingxin Environment needs to increase the

proportion of R&D personnel, while Energy-saving Guozhen should introduce more high-level talents; (5) The governance environment of both companies has improved, and the level of governance has been enhanced.

Based on the above analysis, this paper proposes the following suggestions for private environmental protection enterprises planning to implement reverse mixed-ownership reform: First, when choosing the state-owned capital to participate in, environmental protection private enterprises should comprehensively consider their own needs and select the most suitable state-owned capital partners according to the company's strategic goals and existing advantages, to ensure that the introduction of state-owned capital can truly promote enterprise development; secondly, after the introduction of state-owned capital, private enterprises should actively promote resource integration and institutional reform to ensure that the mixed-ownership reform is not just at the level of equity changes, but through in-depth structural adjustments and management innovations, achieve long-term development of the enterprise; finally, before and after the introduction of state-owned shareholders, private enterprises should continue to strengthen their own strength and core competitiveness. Although the introduction of state-owned capital can provide financial and resource support, private enterprises cannot rely solely on external assistance; they must continuously improve their own capabilities to maintain a competitive edge in the fierce market competition.

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