A Pathway Study on How Green Mergers and Acquisitions Drive Corporate Green Transformation: Evidence from the Cement Industry

Yufei Sun*

School of Business, Anhui University of Technology, Ma'anshan, China

*Corresponding author: yufeisun1125@gmail.com

Abstract. In recent years, green mergers and acquisitions (green M&As) have gained widespread attention as a critical strategic approach for enterprises to acquire green resources and achieve capability upgrades. As a typical high carbon-emission industry, the cement sector plays a particularly crucial role in advancing green transformation. This paper constructs a three-dimensional path model illustrating how green M&As drive corporate green transformation, encompassing three paths: resource integration, management synergy, and performance improvement. The model reveals the internal mechanisms linking green capability acquisition, organizational integration, capability transformation, and value realization. The results show that green M&As can significantly enhance firms' environmental performance and green innovation by introducing green assets and technological resources, promoting synergy in governance structures and corporate culture, and unlocking integration benefits. Furthermore, this study offers targeted recommendations from three perspectives: optimizing resource allocation, building institutional coordination, and securing performance transformation. This paper contributes to a deeper understanding of the underlying mechanisms of green M&As and provides theoretical support and practical insights for the green upgrading of heavily polluting industries.

Keywords: Green mergers and acquisitions; green transformation; resource integration.

1. Introduction

Amid growing global resource constraints and intensifying challenges posed by climate change, green transformation has emerged as a central imperative for achieving high-quality economic development. Zhou emphasizes that green transformation is essential to sustainable development and serves as a critical foundation for a uniquely Chinese path to modernization characterized by harmonious coexistence between humanity and nature [1]. For businesses, going green does more than just boost their competitive edge-it also promotes sustainable, high-quality growth in today's evolving landscape [2]. As the global economy shifts toward a more environmentally conscious model, helping companies adopt greener practices has become essential for staying competitive and meeting changing market expectations.

Lately, academic interest in green transformation has grown significantly, with researchers exploring it through various theoretical lenses and data-driven studies. For example, Dai and Cheng used empirical research to explore how the new concept of 'quality productivity' supports green transformation, showing how it positively affects a company's efficiency and performance [3]. Liao et al. studied the function played by the finance policy-especially green credit regulation-in influencing the green transformation of companies, in light of special emphasis on the distribution of capital and orientation towards green technology [2]. In addition, Cheng and Wu employed the twin machine learning method in studying how green bonds enable the green transition process among companies, bringing new light into the relationship between green finance and company environmental strategy [4].

As an organizational vehicle for pushing forward green agendas for corporations, green mergers and acquisitions (green M&As) have become the focus of attention from academic and practitioners in the corporation world. It is believed by Ma et al. that green M&As play an important part in promoting the green transformation of corporations, in particular, in the incorporation of green

innovation resources and the improvement in environmental technology capabilities [5]. Xu et al. used the difference-in-differences (DID) approach and studied the impact of green M&As on the environmental performance of firms [6]. Their research indicates green M&As can help decrease the environmental capital expenditures while enhancing the quality of environmental governance. Additionally, He et al. found that green M&As enhance the environmental information disclosure of acquired firms, thereby improving corporate environmental transparency [7].

As a foundational pillar of China's industrial system, the cement industry faces urgent demands for green transformation. Liu pointed out that although the cement industry has significantly contributed to China's rapid economic growth, its high energy consumption and emission-intensive production model has made it a focal point for national carbon reduction and environmental regulation efforts [8-9]. As one of the primary sources of CO_2 emissions in China, the cement industry plays a decisive role in achieving national energy conservation and emission reduction targets [10]. Therefore, it is imperative for the cement sector to reduce its environmental impact through green transformation in pursuit of sustainable development. Adopting the perspective of green M&As, this paper investigates the transformation pathways within the cement industry, analyzes how such M&As enhance green technologies and optimize governance structures, and aims to offer both theoretical foundations and practical guidance for the sector's green transition.

2. Mechanisms

Against the backdrop of the deepening "dual carbon" strategy, corporate green transformation is no longer merely a passive response to external policy mandates and market pressures, but increasingly a proactive restructuring of firms' internal capability systems. As a strategic instrument for achieving rapid advancement in green capabilities, green mergers and acquisitions (green M&As) embody a complex process of resource integration, organizational synergy, and value creation. Based on such an understanding, the three-dimensional path model-consisting of resource integration, managerial coordination, and performance improvement-from the point of view of enterprise capability reconstruction is in this study elaborated. The model explains the internal mechanisms in which green M&As drive firms' green transformation through the introduction, integration, and recomposition of capabilities.

2.1. Resource Integration

The main obstacle to corporate green transformation is usually the lack of green resources and the frailty of basic capabilities. Green mergers and acquisitions (green M&As) provide a strategic breakthrough point through the acquisition of target firms possessing green advantages, thus bringing in green assets, cutting-edge technologies, specialized talents, and green market resources. In this way, it achieves the swift establishment of core capabilities for green transformation.

The investment of green assets-like energy-efficient and emission-saving equipment, clean energy facilities, and pollution abatement plants-yields both immediate environmental benefits and a decrease in the reliance on conventional high-carbon production modes. Simultaneously, the green technology innovation that the target companies have amassed in the fields of, for instance, energy efficiency, recycling, and carbon capture grant the acquirers sustainable technological enhancements. Technology grafting of this kind is frequently the main facilitator of "leapfrogging," which enables traditional businesses to vie on equal terms with green frontrunners.

On the human capital front, green M&As offer ways of importing green experience into business operations. Professionals in the areas of environmental engineering, green design, and carbon asset management are brought into the acquirer to fill in-house green governance and operations deficiencies. The target company's customer base, supply chain, and green market reputation provide new markets for expansion to the acquirer to which the acquiring company will be well placed to achieve competitive advantage in an increasingly green-focused marketplace.

In essence, the process of resource integration is a process whereby companies strive to procure external inputs in order to build green capabilities. Not only does it address capability bottlenecks, but it also lays a solid foundation for subsequent institutional integration and value capture.

2.2. Managerial Synergy

Green capability building is merely the initial phase of change. Genuine green change needs to be ingrained in the organizational practices and management systems of the firm within. Profound integration into organizational structure, management systems, and company culture through green mergers and acquisitions (green M&As) is the method to render transformation endogenous and long-lasting.

At the company level, companies are likely to restructure their existing organization as a response to green change needs, for example, by establishing specialized environment management departments or green development officers. With such restructuring, environmental management is elevated from a marginal activity to a central function. By institutionalizing green activities and reconfiguring job positions, environmental actions shift from ad hoc coordination to embedded in the routine operations.

Meanwhile, post-merger institutional integration facilitates the convergence of different entities on environmental norms, energy use, and emission standards, ultimately delivering one green governance system. The target firm's existing green routines—carbon footprint monitoring and green procurement policies, for instance—are systematically incorporated and scaled up to the group level, transforming fragmented initiatives into a coherent management system.

Increased synergy is also seen in cultural integration. Green M&As frequently bring together conflicting values and operating logics: the target company may value environmental sustainability and responsibility, and the acquirer may value short-term performance and efficiency. Integration demands that firms develop a common set of green values through training and communication, changing incentive structures, and reformulating company vision. These exercises assist in the formation of the mindset of the employees, slowly developing the long-term orientation and green value creation culture.

This route not only enables the incorporation and enhancement of green management mechanisms but also assists in the embedding of green values as collective beliefs and standards of behavior throughout the firm, generating internal momentum for capability alteration.

2.3. Performance Enhancement

The ultimate objective of green mergers and acquisitions (green M&As) is the overall enhancement of corporate performance. Green transformation can be both operationally feasible and strategically attractive only when environmental benefits, innovation capability, and economic returns develop in tandem.

As managerial synergy and resource integration take their effect, firms come to experience a dramatic boost in their environmental performance. Reductions in pollutant emissions, improvements in energy efficiency, and more efficient use of raw materials not only reduce environmental compliance costs and regulation risks but also lead to enhanced external environmental ratings as well as improved access to green finance.

Additionally, the combination of professional human capital and green technology significantly boosts corporate innovation. Under the dual impetus of policy incentives and market pressure, corporations vigorously develop green product innovation and green business models. With ongoing technological innovation and product development, they push the boundaries of "green value." Such innovation not only enhances competitiveness in new green market niches but also provides a replicable model for transforming the industry as a whole.

In terms of economic performance, the synergies generated by green M&As help reduce operating costs, optimize resource allocation, and enhance operational efficiency. Simultaneously, the

establishment of a strong green corporate image contributes to higher valuations in capital markets, attracts ESG-oriented investors, and improves the firm's overall resilience and growth potential.
The formation of the performance enhancement pathway represents the natural outcome of the complete process of "capability acquisition-organizational integration-value realization." It confirms the strategic soundness of green M&As and provides measurable, replicable, and communicable evidence for the value of green transformation.

3. Recommendations

Green mergers and acquisitions (GMAs) serve as a crucial practical pathway for promoting corporate green transformation. Their effectiveness depends on the coordinated advancement of key elements, including resource integration, managerial synergy, and performance enhancement.

At the level of resource integration, enterprises should place greater emphasis on the precise acquisition of green assets, technologies, talents, and market resources. On one hand, during the pre-acquisition phase, companies need to utilize a sound due diligence mechanism to identify green targets that align strategically-particularly in sub-sectors such as energy conservation, environmental protection, and new energy materials. Priority should be given to potential enterprises that possess core green technologies and stable market channels. At the same time, governments and industry associations can play a guiding role by establishing public information platforms for green enterprises and technologies, thereby helping companies rapidly access high-quality acquisition resources. On the contrary, green talent induction via mergers and acquisitions also requires policy support. Residency facilitation and training subsidy for high-end green professionals can enable enterprises to re-organize human resources more easily during post-merger organizational integration. In addition, in green technology and carbon asset evaluation, it is required to promote specialization and systematization of evaluation standards. This can prevent the disregard of "invisible" green value, which can otherwise distort corporate resource allocation decisions.

In managerial integration, firms must give high priority to the building of green governance capability as an essential objective to enable post-acquisition institutional synergy and cultural assimilation. Green concepts should not be limited at the strategic statement level but should seep into all aspects of business operations through organizational remodeling and institutional re-engineering. For example, establishing a dedicated green development management department or forming a green committee led by senior executives can incorporate green objectives into the overall corporate strategy, thereby aligning resources with responsibilities at the organizational level. At the same time, based on existing systems, enterprises should promote deep collaboration in governance practices between the parent and the acquired companies through unified environmental management standards, performance evaluation systems, and green procurement processes. More critically, the advancement of green transformation requires consensus on culture and recognition of shared values. This not only involves management measures such as integration-oriented training and incentive mechanism adjustments but also requires building a shared vision and strengthening communication mechanisms to dissolve organizational boundaries and resolve cultural conflicts-ultimately embedding green values into employee behavior and forming a collective belief system.

Performance improvement is a key dimension for evaluating the success of green mergers and acquisitions. To unlock the green value generated through integration and synergy, enterprises must establish a systematic green performance evaluation and incentive mechanism. In addition to focusing on improvements in environmental indicators such as carbon emissions, energy consumption, and water pollution, long-term values such as green innovation output and enhanced market competitiveness should also be emphasized. The other driving force for performance transformation is resource reallocation-effectively connecting the parent company's technological platforms and financial strengths with the professional capabilities of the acquired company to trigger green innovation. Firms must also fully utilize green finance instruments like green bonds and carbon finance instruments. Not only do these instruments offer low-cost funding for green transformation,

but they also promote market awareness and reputation through ESG ratings and transparency of information. Green mergers and acquisitions cannot be viewed as isolated incidents of resource procurement but as a process of defining long-term green capabilities and driving systemic transformation. Only by effectively linking resource integration, managerial synergy, and performance transformation can enterprises form a positive closed loop of green capability introduction, integration, transformation, and value realization-driving steady progress on the path to sustainable development.

4. Conclusion

Against the backdrop of accelerating global sustainable development strategies, traditional high-carbon industries are urgently seeking effective pathways for green transformation. Taking the cement industry as the research object, this study constructs a three-dimensional pathway model of how green mergers and acquisitions (GMAs) drive corporate green transformation from the perspective of capability reconfiguration. The model encompasses three critical dimensions: resource integration, managerial synergy, and performance enhancement. The findings indicate that GMAs not only facilitate the acquisition of green assets, technologies, and talent, but also enhance green governance through deep organizational and institutional integration. Ultimately, this leads to significant improvements in environmental performance, green innovation capacity, and economic returns-forming a transformation loop of "green capability acquisition-organizational integration - capability conversion-value realization." In addition, this paper provides targeted recommendations for optimizing the transformation pathways, offering both theoretical support and practical guidance for green upgrading in high-carbon industries, particularly heavily polluting enterprises.

Despite the systematic exploration of the relationship between GMAs and corporate green transformation, several limitations remain. First, the study is primarily based on theoretical analysis and lacks empirical data support. Future research could incorporate specific case studies or large-sample empirical analyses to enhance the applicability and persuasiveness of the conclusions. Second, this paper focuses on the cement industry, while other high-carbon sectors (such as steel and power) may exhibit different transformation pathways. Follow-up research could expand the analytical scope through cross-industry comparisons or investigations into sectoral synergies. Third, green transformation is influenced by various external factors such as policy environments and financial support. Future studies may introduce richer exogenous variables to deepen the understanding of the mechanisms through which GMAs facilitate green transformation.

References

[1] Zhou H. Comprehensive green transformation of economic and social development: Value implications, transformation pathways, and implementation mechanisms. Journal of Beijing Administrative Institute, 2025: 1–10.

[2] Liao X, Wang J, Wang T, et al. Green credit guideline influencing enterprises' green transformation in China. Sustainability, 2023, 15(15): 12094.

[3] Dai X, Cheng P. The green transformation effect of new quality productivity: Theoretical exposition and multidimensional empirical study. Journal of Nantong University (Social Science Edition), 2025: 1–23.

[4] Cheng Z, Wu Y. Can the issuance of green bonds promote corporate green transformation?. Journal of Cleaner Production, 2024, 443: 141071.

[5] Ma J, Li Z, Wu J. Are green mergers and acquisitions the path to green transformation for heavily polluting enterprises?. Journal of Science and Technology Management, 2024, 26(06): 37–48.

[6] Xu Y, Wang W, Gao H, et al. The impact of green mergers and acquisitions on corporate environmental performance: Evidence from China's heavy-polluting industries. Sustainability, 2024, 16(9): 3796.

[7] He S, Wei Y, Li W. Research on the impact of green mergers and acquisitions of heavily polluting enterprises on the quality of environmental information disclosure: Empirical evidence from listed companies in China. Environment, Development and Sustainability, 2024.

[8] Liu Y. Performance study of green mergers and acquisitions in heavily polluting enterprises. Inner Mongolia University of Finance and Economics, 2024.

[9] China Building Material Federation. Implementing the national carbon emissions trading market expansion deployment to promote the green and low-carbon transformation of the cement industry. China Building Materials, 2025(04): 35–37.

[10] Lin B, Zhang Z, Ge F. Energy conservation in China's cement industry. Sustainability, 2017, 9(4): 668.